
**Committee on the Peaceful
Uses of Outer Space
Fifty-fifth session**

Script

651st Meeting
Monday, 11 June 2012, 15.00 p.m.
Vienna

Chairman: Mr. Yasushi Horikawa (Japan)

The meeting was called to order at 15.00 p.m.

The CHAIRMAN Good afternoon distinguished delegates. I now declare open the 651st meeting of the Committee on the Peaceful Uses of Outer Space.

Distinguished delegates, I would first like to inform you of our programme of work for this afternoon. We will continue our consideration of agenda item 8, "Report of the Scientific and Technical Subcommittee on its forty-ninth session" that we have suspended, pending a statement by the Chair of the Working Group on Long-term Sustainability of Outer Space Activities. We will also continue and suspend our consideration of agenda item 9, "Report of the Legal Subcommittee on its fifty-first session", pending consultations on national space legislation. We will continue and conclude agenda item 12, "Space and water", and agenda item 13, "Space and climate change".

There will be two technical presentations this afternoon: by a representative of Germany entitled "Safe and reliable navigation of vessels in ocean, coasts and harbours areas based on GNSS and its augmentation systems", and by the observer of SCOSTEP entitled "Work of the Scientific Committee on Solar-Terrestrial Physics (SCOSTEP)".

The Action Team on Near Earth Objects will hold its second meeting from 3.00 p.m. to 6.00 p.m. in room MOE19.

In the evening, there will be a reception hosted by the United States in the Mozart Room of the VIC Restaurant, starting at 6.00 p.m.

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

Distinguished delegates, I would now like to continue our consideration of agenda item 8, "Report of the Scientific and Technical Subcommittee on its forty-ninth session" that we have suspended, pending a

statement by the Chair of the Working Group on Long-term Sustainability of Outer Space Activities. We will also hear a statement upon the request of the delegation of Venezuela.

We will therefore begin by hearing the statement of Bolivarian Republic of Venezuela, You have the floor.

Mr. R. Becerra (*Bolivarian Republic of Venezuela*) Thank you very much Chairman for giving me the opportunity to re-open item 8, I promise I will be brief and I won't take up too much time, so let us begin.

Mr Chairman, this delegation would like to thank the Secretariat for the presentation of the report of the Scientific and Technical Subcommittee and acknowledges the interests in dealing with current issues affecting State's activities in outer space. In this perspective, this delegation attaches great interest to the following issues dealt with long-term sustainability's of outer space activities, the use of nuclear power sources in outer space and guidelines for the mitigation of space debris and the equative use of geostationary orbit. With regards to the long-term sustainability of outer space activities, this delegations is very concerned about the superficial handling of the concept of safety. The unilateral action justified in terms of national defence above, enshrined principles in international law, seems to be prevailing. Any initiative should abide by the legal principles governing the activities of State's in outer space paying due attention not to allow the location of weapons in this area under no pretext. By virtue of the impact of this subject for space activities at planetary level, we reiterate that decisions of the direct responsibility of State's and should be made in an inter-State sphere, not in parallel meetings coordinated by groups of experts who in many cases are only representing commercial interests.

I'd like to make a one-minute long reflection that we have always said; sustainability needs more time for discussion in this room. Many delegations do

not have full staff to participate in parallel meetings and often we need interpretation to better understand subjects.

We should not give priority to trade interest to the detriment of the social needs of our peoples nor should we allow countries with technological powers based on existing problems created by themselves to generate controls and restrictions for emerging countries, and finally we should promote the creation of binding standards by virtue of the existing legal framework which has proven to be insufficient. We also concerned that the working group does not directly tackle the use of nuclear power sources in outer space, and the direct implications with the safe and sustainable use of this.

Mr. Chairman, for the case of the use of nuclear power sources in outer space, this delegation recalls its commitments stemming from the 47th session of the Technical Subcommittee according to which all actions should respect international law, the UN Charter, and outer space treaties. Moreover, any additional work should have the plural participation of Member States under the strict approval of this Committee. Within these ideas and given the seminars that have been organized on the subject, we see that some delegations wish to establish as a principle that the future of activities in space will depend on nuclear power sources with a strong emphasize on the use of the Earth's orbit. We are convinced that to cover essential needs to provide telecommunications, telemedicine and distance learning services, as well as other scientific applications linked to Earth observation, we have solar energy and we will have that in the future too. We cannot permit the proliferation of nuclear power in space, especially in the Earth's orbit without studying the impact of it on mankind and certainly not in the absence of a regulatory framework that clearly establishes responsibilities and provides legal and technical instruments to deal with any critical situation that could arise from undue practices.

It is clear that the safety framework covering nuclear power sources in space is insufficient, regarding the guidelines to mitigate space debris approved by General Assembly and resolution 62/217, this delegation believes we need to continue and perfect the existing guide for the mitigation of space debris and we welcome the fact that the Legal Subcommittee has the possibility of carrying out the respective legal analysis within the framework of its competences. Finally, with this I conclude Mr. Chairman, this delegation attaches special attention to the equal access of all States to the orbit spectrum

resources in geostationary orbit as this is a limited natural resource. On the basis of this, we believe that this subject should continue to be discussed within COPUOS and I'd like to mention the work of the sustainability group, as I said this morning, we don't discuss the really relevant subjects, we discuss things which are only of importance to a small group of countries. Thank you very much Mr. Chairman.

The CHAIRMAN I thank the distinguished delegate of Bolivarian Republic of Venezuela for his statement. Next speaker on my list is distinguished representative of Germany, you have the floor.

Mr. Froehlich (Germany) Mr. Chairman, distinguished delegates, Germany welcomes the progress made during the forty-ninth session of the Scientific and Technical Subcommittee by the Working Group on the Long-Term Sustainability of Outer Space Activities. We would like to express our gratitude to the Chair of the Working Group, Peter Martinez, for his work, and we appreciate the efforts of the Chairs and Co-Chairs of the Expert Groups, These Expert Groups have successfully addressed specific topics, such as Space Weather and Space Debris, and they have established efficient working methods. German experts are actively contributing to the Expert Groups and have proposed a set of guidelines and best practices that could be applied to the benefit of all nations.

It should be noted that the identification of issues not addressed by current practices or guidelines may also be of importance. Germany would welcome it if Expert Groups would raise such issues with the Long-term Sustainability of Outer Space Working Group for further consideration.

Mr. Chairman, In addition to our statement during this year's session of the Scientific and Technical Subcommittee, we would like to inform you with regard to the agenda item "remote sensing" that the European Environment Agency has contracted GAF AG to map high-resolution Forest and Impervious Area characteristics for two lots in West, Central and South-Eastern Europe in the framework of the GMES Initial Operations Land Monitoring Services.

After several years of industry's support for the Global Monitoring for Environment and Security (GMES) initiative, a first operational GMES land service is now being implemented within the GMES Initial Operations Programme. The GIO Land Monitoring Service comprises mapping of seamless high-resolution layers, addressing the key

characteristics of five main land cover types; these include artificial surfaces, forest areas, grassland areas, wetlands and water bodies. Under the coordination of the European Environment Agency, industry will be responsible for the main stages of the production process and EEA Member States will engage in verification and enhancement of the products.

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

The CHAIRMAN I thank the distinguished representative of Germany for her statement. Are there any other delegates wishing to speak at this time? I see distinguished representative of Saudi Arabia, you have the floor.

Mr. M. A. TARABZOUNI (*Saudi Arabia*) Thank you Mr. Chairman. We do support the serious work by the Legal Subcommittee to preserve outer space for peaceful purposes and also this will enable to secure the sustainability of activities carried by non-governmental organizations.

As for the geostationary orbit, we hope that the developing countries will be enabled to have orbital positions, especially in view of the fact that there are States and organizations that possess these positions out of repeated use. Thank you very much.

The CHAIRMAN I thank the distinguished representative of Saudi Arabia for his statement. Are there any other delegations wishing to make a statement on this agenda item? I see none.

Last week I informed the Committee that I had received a request of the Chair of the Working Group on Long-term Sustainability of Outer Space Activities to address the Committee in order to provide an update on the progress of work of the expert groups of that Working Group. As there were no objections, I now invite the Chair of the Working Group on Long-term Sustainability of Outer Space Activities, Peter Martinez of South Africa, to address the Committee.

Mr. P. MARTINEZ (*South Africa*) Mr. Chairman, Thank you for allowing me this opportunity to brief delegations on the progress of the activities of the Working Group on the Long-Term Sustainability of Outer Space Activities under the agenda item on the Report of the Scientific and Technical Subcommittee.

The four expert groups established under this Working Group are meeting on the margins of this session of the Committee, as agreed by the Working

Group in February 2012. The meeting schedule was distributed to all delegations as a non-paper at the start of this session of the Committee last week.

Mr. Chairman, in order to allow delegations to follow the progress of the expert groups, a number of expert group documents have been issued to all delegations during this session of the Committee.

The workplans of the four expert groups were distributed in all languages, with document numbers A/AC.105/C.1/L.324, L.325, L.326 and L.327. As agreed in the Working Group, these documents are being made available for comments by member States and permanent observers of the Committee. Following the present session of the Committee, the Secretariat will invite member States of the Committee to provide comments to the working papers by the expert groups. Comments received will be transmitted to the respective expert groups for their consideration. The designated national focal points will also be duly notified.

The latest list of national focal points and members of the expert groups provided to the Secretariat as of the 1st June 2012 was distributed as document A/AC.105/2012/CRP.14. Delegations are invited to provide corrections, additional names and other modifications to the Secretariat.

I would like to encourage countries that have not yet nominated a national contact point or experts to consider doing so. The expert groups are now commencing substantive discussions on possible guidelines and these discussions will be considerably enhanced with a broader participation of all member States of the Committee.

Further documents submitted to the Secretariat for the use of the expert groups may be viewed on the dedicated webpage of the Working Group on Long-Term Sustainability.

Mr. Chairman, I am pleased to report that Expert Group A on Sustainable Space Utilisation Supporting Sustainable Development on Earth has informed me that they have elected Mr. Enrique Pacheco Cabrera of Mexico to co-chair that expert group, together with Dr. Filipe Duarte Santos of Portugal.

Likewise, Expert Group C on Space Weather has informed me that they have elected Dr. Ian Mann of Canada to co-chair that expert group, together with Dr. Takahiro Obara of Japan,

As mandated by the Working Group in February, the Chair of the Working Group and the expert group chairs held meetings on the 5th and the 8th of June to coordinate the work of the expert groups, with emphasis on addressing gaps, identifying cross-cutting issues and avoiding duplication of efforts.

Mr. Chairman, delegations will recall that the workplan for the Working Group mandates a second long-term sustainability workshop, to be held in conjunction with the 50th session of the STSC in February 2013.

The workplan for 2013 also specifies that States members of the Committee will be invited to include in their delegations representatives of national, non-governmental organizations and of private sector entities having experience in space activities to provide information on their experiences and practices in the conduct of sustainable space activities at a workshop to be held in conjunction with the fiftieth session of the Subcommittee.

Discussions have already commenced within the expert groups on how best to prepare for such a workshop. The approach currently under consideration is to arrange a joint meeting of the expert groups, to which representatives of non-governmental organizations and private sector entities will be invited to give their inputs. The discussions from the joint expert group meeting will be consolidated by the expert groups into four presentations that will be delivered by the expert group co-chairs at the second long-term sustainability workshop. These presentations and discussions will be conducted in all official languages of the United Nations.

Mr. Chairman, in concluding this brief report, I would like to thank all the co-chairs of the expert groups for their excellent leadership of the deliberations thus far. I would also like to thank the Secretariat for their excellent support of the expert groups and for producing the expert group working papers in all official languages in time for this session.

Mr. Chairman, an informal feedback session will be held tomorrow, immediately following the end of the morning session, here in M1. I will review the progress of the expert groups thus far, the documentation plans for the STSC next year and the plans for the long-term sustainability workshop in a bit more detail. There will also be an opportunity for questions and discussion. Thank you, Mr. Chairman.

The CHAIRMAN Thank you, Mr. Martinez for providing us with this important update.

Distinguished delegates, I would also like to inform you that the chair of the Action Team on Near-Earth Objects would like to make a statement under this agenda item to update the Committee on the current work of the Action Team on Near-Earth Objects. As the Action Team is still meeting until Tuesday afternoon, we will therefore suspend our consideration of agenda item 8, "Report of the Scientific and Technical Subcommittee on its forty-ninth session", pending a statement by the Chair of Action Team on Near-Earth Objects.

Distinguished delegates, I would now like to continue and suspend our consideration of agenda item 9, "Report of the Legal Subcommittee on its fifty-first session"

The first speaker on my list is the distinguished delegate of Canada, you have the floor.

Mr. Chouinard (Canada) Thank you Mr. Chairman. Mr. Chairman, distinguished Member States, Canada is pleased to note that the Legal Subcommittee has concluded another successful meeting at its fifty-first session. Fruitful discussions took place in the plenary and working groups, and Canada looks forward to the continuation of its deliberations at next year's session.

As the challenges involved in the conduct of outer space activities continue to emerge and develop, Canada deems it important that the work of the Legal Subcommittee be concentrated on practical legal issues that confront space exploration today.

The Working Group on National Legislation Relevant to Peaceful Exploration and Use of Outer Space concluded its mandate with the submission of its report. Canada thanks the Chair of the working group for the tremendous effort employed over the years to bring this work to fruition. Canada fully endorsed the report, and encourages the Committee to submit it to the General Assembly for its consideration. Canada is pleased that the Subcommittee agreed to keep this topic on the agenda as a recurring item. Sharing of information between Member States on national laws is very important, and Canada and other countries will certainly benefit from the open exchange of such information.

Mr. Chairman, Canada applauded the adoption of the UNCOPUOS Space Debris mitigation guidelines by this Committee in 2007, and the leadership of

UNCOPUOS on this matter. Space Debris is a global concern requiring global solutions. The Canadian delegation wishes to note that for the information of all Member States that the CSA (Canadian Space Agency) has recently formally adopted the IADC space debris mitigation guidelines for application to its future projects and missions.

Canada supports and encourages other Member States that have not yet done so to adopt Space Debris mitigation measures at the national level for their projects, and welcomes the continued inclusion of an exchange of information on national mechanisms relating to space debris mitigation measures on the agenda of the Legal Subcommittee, taking into account the work of the Scientific and Technical Subcommittee. This represents a meaningful way in which the Legal Subcommittee can strengthen the promotion and the implementation of space debris mitigation measures by all States.

Canada strongly supports collaboration at the international level to encourage voluntary actions to address the issue of space debris and to develop better mechanisms for sharing information on national and regional best practices. The work of the Working Group on the Long Term Sustainability of Outer Space lead by the S&T Subcommittee would, we believe, support this aim, and on that point Canada feels that it is important to encourage greater synergy between the work that is being carried out by the Scientific and Technical Subcommittee and the Legal Subcommittee. Inclusion and sharing of information will help improve the quality of deliberations and build consensus on policy outcomes. Canadian delegation encourages the Co-Chairs of Expert Group D and the Office of Outer Space Affairs to liaise closely with the Legal Subcommittee to ensure that the results of its work over the years can be used for the benefit of the Working Group on the Long-Term Sustainability of Outer Space.

Mr. Chairman, it is clear that the Legal Subcommittee is the appropriate forum through which to encourage discussions and build consensus on acceptance of the outer space treaties, while at the same time assisting States in the further development of their own national legislation. In order to continue reaping the benefits that outer space has to offer, Canada believes that all States should adhere to the existing international legal framework governing outer space activities. Canada reiterates its strong support for the core United Nations conventions on outer space and welcomes further initiatives aimed at strengthening them.

Canada also supports efforts to build a more secure and accessible space environment, and encourages discussions in the development of an International Code of Conduct on Outer Space Activities which aims to help maintain the long-term sustainability of outer space and encourage responsible use of this environment. Canada is pleased to have attended the multilateral kick-off meeting on the subject earlier this week. We look forward to working with others to develop non-binding principles to guide our activities in space.

The global use, present and future, of outer space requires specific consultations and discussions on the existing legal framework to ensure the long-term accessibility of this global resource. The Canadian delegation would like to thank the Chair of the Legal Subcommittee for his efforts to ensure fruitful discussions amongst Member States that have greatly contributed to clarifying issues and ultimately have led to a greater understanding of the legal aspects of outer space activities. Thank you, Mr. Chairman.

The CHAIRMAN I thank the distinguished representative of Canada for his statement, the next speakers on my list is distinguished representative of Algeria, distinguished representative of Algeria, you have the floor.

Mr. R. ABIDI (*Algeria*) Thank you Chairman. The Algerian delegation welcomes the remarkable results of the Legal Subcommittee at its fifty-first session. Thanks to the work of its members and also to the work of its Chair, Mr. Brisibe of Nigeria and my delegation would like to pay tribute to him for that. My delegation would also like to pay tribute to the excellent work of professor Marboe of Austria, as head of the Working Group on national legislation. The conclusions of the final report will be very helpful to Member States who wish to be inspired by this voluntary basis to develop a national legal framework. We believe that it should be adopted as an annex to the draft resolution on international cooperation covering the peaceful use of outer space for its adoption by the General Assembly in 2012. We are willing to examine its possible transformation into a separate General Assembly resolution. We support the Working Group on the definition and delimitation of outer space, chaired by Mr. Jose Monserrat Filho of Brazil and that of the State and application of the 5 space treaties under the chair of Mr. Jean-François Mayence of Belgium, which needs the necessary time to consolidate and conclude their work. In this context and bearing in mind the importance of the work to be done by the Legal Subcommittee, it is indispensable

that the 20 sessions allocated to them remain unchanged. Thank you Chairman.

The CHAIRMAN I thank the distinguished representative of Algeria for his statement. The next speakers on my list is distinguished representative of Russia, you have the floor.

Mr. G. Y. BARSEGOV (*Russian Federation*)
Thank you Mr. Chairman. Mr. Chairman, Russia is committed to the objective and the practical measures to strengthen the functions of the Legal Subcommittee. Without this forum, it is unthinkable how we would address many topical issues. Issues that are on the agenda of the Committee and its Scientific and Technical Subcommittee. Each of these agendas is very heavily charged, but also they very clearly overlap. For example, let us look at the document entitled "Towards a United Nations space policy", we plan to provide some detailed comments on that document under the appropriate agenda item. At this point, we'd like to draw the attention of the delegations to the fact that it makes heavy use of new concepts and new phraseology, which is not generally used in international outer space law. For example, space as valuable global commons, orbital environment as a common good, space as a limited natural resource, supported international regulatory environment, responsible use of outer space, to quote just a few. The legal meaning and the expediency of new concepts and categories should be understood by all of us. This would be truly important since the document we are referring to is in many ways an innovative one, a political potent one, and with regard to its format and its content it is a kind of charter. A weighty document, in other words, which of course creates the need for very clear definitions. Maybe the Legal Subcommittee could be helpful to use in that regard.

Let me refer to another example which touches upon both the issues pertaining to the long-term sustainability of outer space, to security in outer space, the safety of space operations and, indirectly, work on a new code of conduct in outer space. All of us must become aware of the fact that if a future regulatory framework to be created here should we be asked to base it on the principle of national security, a principle that would prevail over any other circumstances, made absolute in a way, in fact allowing for any types of actions with a view to implementing it, if that happens, we will have to deal with a new context in which many seemingly established concepts will lose their meaning. Concepts and categories that at present are understandable to use at least as a whole. Take for example the concept of harmful interference, were that to happen, the Legal Subcommittee would surely have

to work on a number of highly competent conclusions. It will need to draw regarding certain international legal issues.

Mr. Chairman, on the whole we evaluate the Working Group on national legislation as a positive effort. It has to do with the use of outer space for peaceful purposes, its report contains some practical ideas which can effectively promote raising the level of regulatory effectiveness in terms of space activities. Having said that, we can't accept some concepts which in one way or another touch upon the future of regulation within the framework of the long-term sustainability of outer space. Ideally, at this point in time, in our opinion, these recommendations should be further developed, recommendations with regard to national legislation that is, should be further developed both at this session and, and this would be preferable, as a result of consultations in our capitals. Of course we are prepared to be flexible in that regard.

Mr. Chairman, we don't think it would be expedient at this point to talk about changing the status of the Committee's guidelines on space debris mitigation and here are the reasons why: first, these principles as they exist at present, perform an important practical function imposing certain limitations on the generation of space debris without going into details regarding technical requirements. Second, the IADC (Interagency Space Debris Coordination Committee) is at the moment working on optimal ways and means of developing such technical requirements, taking into account the views of the various agencies it represents. What we expect is that the technical requirements would be made more stringent, reasonably so. Number three, creating a legally binding document would be impossible, *inter alia*, without resolving such fundamental issues as the definition and delimitation of outer space and air space, clarifying the definition of the concept "space object", developing criteria for distinguishing among various types of space objects, and orbital elements formed as a result of launches, presence in outer space, or destruction of space objects in outer space. Of great significance also is a definition of space activities.

And finally, our last argument: the current guidelines do not stipulate for an exhaustive regulation of issues pertaining to the deorbiting of orbital objects. That is, fragments of space debris or non-functioning space objects. Aspects of such regulation will be considered in the medium term as part of the agenda of the Scientific and Technical Subcommittee, that part of it which has to do with the long-term sustainability of outer space.

Mr. Chairman, to conclude, let me reaffirm the fact that the Russian delegations fully endorse the upshot of the work of the Legal Subcommittee and would like to endorse its report. Thank you very much Mr. Chairman.

The CHAIRMAN I thank the distinguished representative of Russia for his statement. The next speakers on my list is distinguished representative of Austria, you have the floor.

Ms. C. STEINKOGLER (*Austria*)
Mr. Chairman, I apologise for taking the floor again on this agenda item. I would like to express our appreciation for the interest of Member States in the discussions concerning the form in which the “Recommendations on national legislation relevant to the peaceful exploration and use of outer space”, that have been elaborated by the Working Group on national space legislation should be submitted to the General Assembly.

As stated previously, Austria supports the idea that COPUOS submit the recommendations of the Working Group to the General Assembly for the adoption as a separate General Assembly resolution. We welcome the support already expressed by several delegations for this option.

While both options recommended by the Legal Subcommittee are of the same legal value, we believe that only an independent resolution would allow rendering utmost visibility to the important issue of national space legislation as well as to the valuable work of this Committee and its Subcommittee.

The option of an adoption as an annex to the draft resolution on international cooperation in the peaceful uses of outer space, which the General Assembly adopts every year after its discussion of the report of this Committee was taken with regard to the celebration of last year’s 50th anniversary of human space flight. While in that case there was no separate agenda item and no working group established for discussions, the Working Group on national space legislation has formulated its recommendations on the basis and as a result of its deliberations and work according to its five-year work plan under the agenda item “General exchange of information on national legislation relevant to the peaceful uses of outer space”. Many delegations have actively contributed to the discussion in the Working Group. Experts have been involved in the process for years and, based upon thorough deliberations, found a consensus on the present text. Austria would therefore be hesitant to overrule the consensus achieved by the Subcommittee,

and believes that it would be appropriate to conclude the work of the Working Group on national space legislation by General Assembly resolution. Thank you Mr. Chairman

The CHAIRMAN I thank the distinguished representative of Austria for her statement. Are there any other delegations wishing to make a statement under this agenda item at this time? I see none.

We have therefore suspended our consideration of agenda item 9, “Report of the Legal Subcommittee on its fifty-first session”, pending consultations on the text on national space legislation.

I have a request from Secretary to make an announcement. I will give the floor to Secretary.

Mr. N. HEDMAN (*Secretary*) Thank you Mr. Chairman. Just a brief announcement. When this plenary meeting is adjourned this afternoon, if there is any time available up until 6 p.m., there will be informal consultations on this particular issue on the national space legislation text guided the chair of the Working Group on national space legislation, Irmgard Marboe, here in this conference room M1. We do this in order to efficiently use the time available and for the interpretation as well. So there will be informal consultations in this room with interpretation until 6 p.m. Thank you.

The CHAIRMAN Thank you Mr. Niklas Hedman for your announcement. Distinguished delegates, I would now like to continue and hopefully conclude our consideration of agenda item 12, “Space and water”.

The speaker on my list is the distinguished delegate of Indonesia, you have the floor.

Ms. E. S. ADININGSIH (*Indonesia*) Thank you Mr. Chairman. Mr. Chairman and distinguished delegates, recalling the General Assembly resolution number 58/217 which proclaimed the period 2005-2015 as the International Decade for Action “Water for Life”, which reflected the growing awareness of the concern for water-related issues, Indonesia is of the view that space technology can be used in combined with non-space technology to reduce or minimize the impacts of floods, droughts and earthquakes and also to improve the accuracy of weather predictions or forecasts.

Indonesia is a wide tropical country affected by global climate and weather systems, but it also has atmospheric-ocean-terrestrial interactions which

produce a unique weather and climate system. Although Indonesia has no arid area nor extreme dry climate, it has been facing water resources problems in terms of the availability of water resources in timely manner and good quality for various utilizations.

Indonesian delegation would like to convey the view that as a very populous country, we need water resources, not only for drinking water but also for farming, industry, energy and so on. With the changing climate, water availability from one season to another is affected. Considering the benefit of space technology for natural resources monitoring, space-based information has been utilized broadly by various sectors dealing with water resources management in Indonesia. Geostationary meteorological satellites, such as MTSAT series, as well as polar Earth observation satellites, such as Landsat, SPOT, NOAA and MODIS series, are among of the space-crafts providing very useful data for such purposes. Indonesia, through Water Resources Management Agency under the Ministry of Public Works, has also actively participated in the activities of the Asian Water Cycle Initiative, or AWCI, which is under the Global Earth Observation System of Systems, or GEOSS, to share space-based data or information and expertise among Asian countries for water resources management.

Mr. Chairman, Indonesian delegation, therefore, supports the agenda "Space and Water" of this Committee to be continued in the future and we are willing to engage in the discussions to come up with recommendations and conclusions on the utilizations, international cooperation as well as free access to space technology which are beneficial to support water resources management in developing countries, in particular, which are facing water supply problems.

Thank you Mr. Chairman for the opportunity to share our views.

The CHAIRMAN I thank the distinguished representative of Indonesia for her statement. Are there any other delegations wishing to make a statement under this agenda item at this time? I recognize distinguished representative of Saudi Arabia, you have the floor.

Mr. M. A. TARABZOUNI (*Saudi Arabia*)
Thank you Mr. Chairman. On the basis of General Assembly resolution 58/217, which considered the period 2005-2015 an international decade for action water for life, which raised awareness regarding water related issues. We have participated here, and especially during this last part of this decade to call for

using more and more satellites to study land and water. Considering that these space-based data come from various platforms and allow us to study water using space technology to study better management of water resources, despite all that we notice that most countries, especially developing countries that are desert or semi-deserted countries, among which we find Saudi Arabia, suffer from an inability to derive these data periodically, and thus we are not able to better use water or take advantage of studies related to drought or dry areas. Therefore we hope that regional and national programmes will be established to help us in this regard. We call on space-faring nations and those who have space-based data to allow us to use their data through introducing it and inputting it into UNSPIDER. You have all heard of the Prince Sultan Abdul-Aziz Prize for Water and we hope that this item will continue to be included in the future. Thank you Mr. Chairman.

The CHAIRMAN I thank the distinguished representative of Saudi Arabia for his statement. Are there any other delegations wishing to make a statement under this agenda item at this time? I see none. We have therefore concluded our consideration of agenda item 12, "Space and water".

Distinguished delegates, I would now like to continue and hopefully conclude our consideration of agenda item 13, "Space and climate change".

The first speaker on my list is the distinguished delegate of Japan, you have the floor.

Ms. M. MURAYAMA (*Japan*)
Mr. Chairman, distinguished delegates, on behalf of the Japanese delegation, I am pleased to express our view on the current agenda item "Space and climate change".

Climate change is an urgent issue for all countries, not only for developed countries but also for developing countries. This issue is a threat to human security across borders. Due to this issue's unique feature, we should solve this problem in an urgent manner and Japan is therefore working on this actively. Based on our idea that it is crucial for all major countries to prevent a gap in taking action to solve this issue, Japan has participated in the UNFCCC and other bodies. Therefore, Japan would like to share the issues each nation is addressing as well as introducing our actions with regards to using CO2 monitoring data from outer space under this agenda item. We also expect this agenda item in COPUOS to help solve climate change.

Concerning contributions made on the issue of global climate change and other global environmental issues by Earth observation satellites, Japan has played a leading role in the establishment of the Global Earth Observation System of Systems (GEOSS). Japan, with the help of international cooperation, intends to implement the observation of greenhouse gases, climate change and global water circulation monitoring by working to establish GEOSS. JAXA has taken a leading role for two years as the chair of the Strategic Implementation Team (SIT) of the Committee on Earth Observation Satellites (CEOS). Last year, SIT chair was successfully transitioned to NASA. JAXA will continue to be an active member of CEOS, through not only the current activities of greenhouse gas, forest carbon monitoring, but also water cycle monitoring. JAXA has also initiated the activity on agriculture concerning rice crop monitoring in the South-East Asian region by using Earth Observation satellites. This activity will contribute to GEO Global Agricultural Geo-Monitoring Initiative, so called GEO-GLAM, which was launched by the meeting of G20 Agriculture Ministers in France, June 23, 2011.

From 2 to 4 April 2012, the 5th GEOSS Asia-Pacific Symposium was held in Tokyo at the National Museum of Emerging Science and Innovation (Miraikan). The Symposium was co-organized with GEO Japan and with the support of Japan's Ministry of Education, Culture, Sports, Science and Technology, addressed the theme of "GEO Initiatives towards Green Growth in the Asia-Pacific Region", particularly in the fields of water, biodiversity, forests, ocean and agriculture. Central to this theme was discussion on how GEOSS can contribute to the upcoming United Nations Conference on Sustainable Development (Rio+20). A "Tokyo Statement" was adopted to support the Rio+20 conference objectives. JAXA contributed significantly to this symposium and in particular water, forests and agriculture areas.

Mr. Chairman, the "Greenhouse Gases Monitoring from Space", to prevent global warming and reduce greenhouse gases emissions, such as carbon dioxide (CO₂), 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 300 ground observing points in the world. The Greenhouse Gases Observing Satellite, GOSAT or "IBUKI", the joint mission of Ministry of Environment, the National Institute for Environmental Studies (NIES) and JAXA, launched January 2009, can accurately observe the concentration distribution of global greenhouse gases in the atmosphere, which had not been directly measured before, by taking

measurements in thousands spots of almost the entire surface of the Earth with high-precision sensors. Last year, monthly net fluxes of CO₂ by regions were estimated from ground-based observations and GOSAT Level 2 data product. This data was provided to scientists around the world and are currently under investigation. Since it is important to continue monitoring global greenhouse gases in the long term, JAXA, NIES and Ministry of Environment are studying the follow-on mission.

With regards to forest and carbon tracking, JAXA's Advanced Land Observing Satellite "DAICHI" Phased Array type L-band Synthetic Aperture Radar (PALSAR) is likely to be valid for achieving "Measurements, Reporting and Verification" or "MRV" proposed in REDD+. "DAICHI" could detect forest/non-forest areas and measure the amount of aboveground forest biomass, which is critical information for measuring forest carbon absorption and emission. In October 2010, JAXA generated 10-meter resolution images and maps of the global forest and non-forest area distribution using PALSAR data, which has the highest resolution in the world. Furthermore, archived data from "DAICHI" is currently utilized for monitoring illegal logging in the Amazon in cooperation with Brazilian forest management entities, and JAXA has initiated REDD+ cooperation using "DAICHI" with the Brazilian National Institute for Space Research (INPE). JAXA and INPE will verify the utilization of the SAR on board "DAICHI" to monitor tropical deforestation. Japan will continue to contribute to the solution of global environmental and climate change issues through collaboration with international organizations, such as UNESCO for a better implementation of the World Heritage Convention for preserving world heritage sites and the Ramsar Convention for wetland monitoring.

JAXA has been developing the next generation satellite, ALOS-2, which will on board L-band SAR, and also ALOS-3, which will be on board optical sensors. ALOS-2 will be launched in 2013. They will continuously succeed the various observations being conducted by "DAICHI". In cooperation with national agencies, JAXA will continue to demonstrate the effectiveness of satellite applications in disaster management, including their ability to give disaster management organizations immediate information in the aftermath of natural disasters.

Mr. Chairman, lastly, I would like to share information on our efforts to facilitate the food supply in Japan. Regarding advancements in agriculture, it is possible to estimate the growth status of grains, such as rice, and the quality of contents, such as protein,

moisture and so on using the analysis of the satellite images. In this regard, operations are underway in Japan.

Our next step is to improve the sophistication of farm management by improving estimation accuracy. The continuous satellite monitoring of agricultural production would provide important information on determining a strategy to secure food production in our country. We will continue to utilize this type of information.

Mr. Chairman, Japan supports this agenda item being continued after next year's session, because it is an opportunity for us to share our actions or solutions, and we believe that this Committee can make efforts to solve climate change issues globally no matter how small we, the space community, are. Thank you for your attention.

The CHAIRMAN I thank the distinguished representative of Japan for her statement. The next speaker on my list is the distinguished representative of Italy, you have the floor.

Ms. G. ARRIGO (*Italy*) Thank you Mr. Chairman. Mr. Chairman, distinguished delegates, the Italian delegation is pleased to present some points relating to the item 13 "Space and climate change".

The deadline and the target of reducing greenhouse gas emissions by 5.2 per cent on average for the period 2008-2012 should be soon verified. Almost 184 countries have expressed their commitment to fulfil this requirement.

Italy, like many other countries, is far from a full compliance of this target, nevertheless, it is strongly engaged, leading and participating in several national and international studies and projects on climate change and related impact. Many Italian research institutions and centres are daily involved in the protection of the environment. Among them, the National Research Council, the High Institute for Environmental Protection and Research, the Italian National Agency for New Technologies, Energy and Sustainable Economic Development, Euro-Mediterranean Center on Climate Change use space technologies and data in their development of models and data bases related to climate change issues.

The Italian Space Agency is also actively involved in climate change activities, supporting a number of national, European and international cooperation initiatives, in particular, in Earth

observation field with the aim to contribute in finding challenging solutions for this open and large problem.

Last session the Committee pointed out that climate change has a huge impact over all regions, in terms of several unpleasant phenomena. One of these events is the global warming, which affects sea ice coverage, causing rising sea levels and unusual ocean currents, storms, tropical cyclones and droughts. This dramatic and global scenario requires a global and regular detection and observation from ground and space. In order to meet this request the Italian Earth observation satellite constellation, COSMO-SkyMed, is fully operational with its four radar satellites in orbit, which monitor constantly sea and Earth, north and south of the globe, the five continents and oceans, in all weather and lights conditions.

Mr. Chairman, Italy participated in ESA programs and activities devoted to Earth observation and environment, such as ENVISAT, GOCE, EDUSPACE. In particular, the ASI space ground segment in Matera represents the national node of the international network for remote sensing data receiving, archiving and processing. On the basis of a new agreement between Italy and Kenya, soon, the space ground segment in Malindi and a new centre in Nairobi will constitute a relevant regional remote-sensing centre in sub-Saharan Africa, focused also to the environmental studies and climate change.

The Italian participation in the activities of the international forums as CEOS or GEO represents also a contribution to the relation between space and climate change.

Mr. Chairman, the Italian Space Agency is presently contributing to a better knowledge of the climate change with a significant space programme, ROSA, a Radio Occultation Sounder for Atmosphere, instrument embarked on board of the Indian satellite OCEANSAT-II the Franco-Indian satellite Megha-Tropiques, the Argentinean and NASA mission, Aquarius/SAC-D, dedicated to the understanding of dynamics of climate change.

Mr. Chairman, finally, allow me to express the fully Italian support in the initiatives taken by the Committee in exploring and sharing visions and data to face the climate change issue. We are convinced that the promotion of the international and regional cooperation is one of the key progress to advance in the understanding the global environmental phenomena. Thank you Mr. Chairman.

The CHAIRMAN I thank the distinguished representative of Italy for her statement. The next speaker on my list is the distinguished representative of Indonesia, you have the floor.

Ms. E. S. ADININGSIH (*Indonesia*) Thank you Mr. Chairman and distinguished delegates, Indonesia is of the view that climate change is global issue. Climate change impacts has to be managed in a proper manner through a collaborative efforts of all nations, including by utilization or applications of space-based data and information for climate change mitigation and adaptation actions.

In today's life, people are very much depended on outer space technology to conduct studies and actions for climate change mitigation as well adaptation. Thus, Indonesia supports the efforts of international and regional cooperation to strengthen and enhance the use of outer space for addressing climate change issues.

Indonesia delegation would like to update on our current activities in benefiting from outer space technology to handle the issues of climate change. Currently, Indonesia has a cooperation with several Asia Pacific countries to develop a programme in the use of remote-sensing data for Firewatch Indonesia, called Indofire, aiming to monitor and predict the land and forest fire risks, since fires are one of the major sources of greenhouse gases emission. Indonesia in cooperation with the Government of Australia and with assistance from all satellite data providers, such as USGS, has also carried out the Indonesian National Carbon Accounting System, or INCAS project. The project depends very much on medium resolution satellite data, such as Landsat data, to map forest cover changes of the tropical forests in Indonesia. A technical presentation on space and climate change in Indonesia will be delivered during the 55th session of this Committee. Indonesia also actively contributes to the development of Space Applications for Environment, or SAFE prototype model and Climate Regional Readiness Review, or CR3, which is the initiative of Asia Pacific Regional Space Agency Forum, or APRSAF.

As Indonesia has a unique climate system and considering the needs to fulfil the lack of meteorological stations in some areas, Indonesia depends very much on space-based data, particularly geostationary meteorological satellite data of the Asia-Pacific region for long-term climate studies. At national level, Indonesia has also developed a programme on the atmospheric monitoring using MODIS data combined with non-space-based data.

However, there is still a need to translate and disseminate all the information to the local community in wide.

Mr. Chairman, Indonesian delegation, therefore, welcomes to any international cooperation and efforts in addressing climate change issues through the applications of space-based data and information. Indonesia would reiterate the importance of the agenda "Space and climate change" of this Committee to discuss further on the use of outer space technology for climate change. My delegation would urge all leading space technology states to continuously undertake earth observation using space technology and provide an open access of the data to all developing nations. We believe that through a wide and open use of reliable space-based data, we could improve our global efforts in combating and mitigating the impacts as well as adapting to the climate change. Thank you Mr. Chairman.

The CHAIRMAN I thank the distinguished representative of Indonesia for her statement. The next speaker on my list is the distinguished representative of Switzerland, you have the floor.

Ms. N. ARCHINARD (*Switzerland*) Thank you Mr. Chair, the Swiss delegation would like to give you a highlight of Swiss activities related to climate change and to GCOS, the Global Climate Observing System.

The Swiss GCOS Office is located at the Swiss Federal Office of Meteorology and Climatology, MeteoSwiss. It is responsible for coordinating all climate observations in Switzerland and has recently issued a new report which provides an overview on the availability of Swiss GCOS data in designated GCOS International Data Centres. This type of information is released in support of one important objective of GCOS, that is, the regular and timely submission of climate data to GCOS International Data Centres for all essential climate variables. As such, the report is a valuable source of information for providers and users of climate information throughout Switzerland. It is, the report is available on the web in English at www.meteoswiss.ch.

Secondly, the Euro-Climhist database was made available to the public last May. This database collects the data from more than 120,000 reports about weather events and natural disasters in Switzerland for the period spanning from as early as 1550 to 1999. Data dating before the first official measures in 1864, were traced back into local chronics, personal diaries, accounting books of public institutions like hospitals,

etc. This data based was established by the Oeschger Center of the University of Berne with the support of the Swiss GCOS Office. These data are useful for the analysis of climate change, the comprehension of natural hazard and the mitigation of their effects. This information can be used by scientist, administrations and planning bureaus. The database is accessible on the web at the address www.euroclimhist.ch. In the next step, the database will be extended to data from other European countries and to data from as early as the Middle Age. Thank you for your kind attention.

The CHAIRMAN I thank the distinguished representative of Switzerland for her statement. Are there any other delegations wishing to make statement under this agenda item at this time? I see none.

We have therefore concluded our consideration of agenda item 13, "Space and climate change".

Distinguished delegates, I would now like to proceed with the technical presentations. Presenters are kindly reminded that technical presentations should be limited to 15 minutes in length.

The first presentation on my list is by Mr. Thoralf Noack of Germany entitled "Safe and reliable navigation of vessels in ocean, coasts and harbours areas based on GNSS and its augmentation systems".

Mr. T. NOACK (*Germany*) Mr. Chairman, distinguished representatives, ladies and gentlemen, thank you very much for this invitation to this workshop here, or to this Committee workshop. My name is Thoralf Noack, I am from the German Aerospace Center, I'm working for the Institute of Communication and Navigation Nautical Systems, and as we can see, the presentation is related to some aspects of GNSS and augmentation systems and, at the beginning of my presentation I would like to bring you on the bridge of a vessel and imagine you are a captain or a navigator on board of a vessel, and if you are on the ocean, this is what you can see if you are on stormy weather. This is a rough sea and you can see nothing around you, you can see not where you are, and you cannot see something around you. Another possibility is for example you are maybe in a coastal region, there is foggy weather, you look around your window and what you can see in principle is nothing. What you can see here is in the background a big vessel passing you, or crossing you, and also in this case you have a demand to get an information of where you are. Or third situation, if you are on the night underway with your vessel, you are maybe not far away from a

harbour and all what you can see is some lights around you, nothing more. This is an entry maybe, and also in this case, you need information about this. This is a challenge we have and, how can I say, we want to know where we are, but we want also to know if you can trust the information you get. This is what we need or what we say for reliable information and we have to find a way to obtain this information.

I Don't want to stress you with some technical aspects, but to explain what I mean with this, I would like to give you an example concerning the difference between accuracy and preciseness. This is in principle a drawing of a horizontal positioning error, and you are in principle in the middle of this XY cross. That means, if you measure something in this green area, then you are in the applicable area, if you have a so-called alarm limit, then you can stay in the tolerable area, this is a yellow area and this is in principle also tolerable, but if you are outside this then it's unusable to use the information you get from your positioning system.

How can you bring it on the bridge? In principle with a very easy tool; a graphical translation for a user operator, this is a signal, and if you measure your cloud inside this green area, then the signal is green, if it is in a tolerable area then the signal is yellow, and if it is unusable then the signal is red. This is in principle very easy, but the difference between accuracy and preciseness in this case that you have here is a cloud, this is in principle very precise but it is far away from the measured point you have in this applicable area and you need accuracy or in this case a reliable information about this.

And this brings me to GNSS because Global Navigation Satellite System can helps us to find a right solution because it is a global system that can be used in an autonomous way to have a global coverage and to get a position on every place on Earth, there you are.

What is the status quo in GNSS? I guess everybody of you is familiar with this, we have the GPS system, the full operational capabilities since 1993, we have the Russian GLONASS systems since 1996, and we have two new systems in development; one is the GALILEO system from the Europeans and the other is the COMPASS system from the Chinese people. And the achievable horizontal positioning accuracy we have is around 5 up to 10 meters.

If you look at the requirements we need for example in maritime areas, when we can say that for example for ocean, coastal and port areas, the accuracy requirement of 10 meters fulfilled if you use a normal GPS, or GLONASS< COPASS or GALILEO system,

but if you look a little bit more into detail concerning requirements we have on future GNSS for port and automatic docking, then we can see we have an absolute accuracy, or requirement on this for 1 meter, for automatic docking for 10 centimetres, and for the integrity issues from 2 and a half meters for the port and 0.25 meters, or 25 centimetres for automatic docking. And that means we cannot solve all problems we have alone with the GNSS, we also need so-called satellite-based augmentation systems. These are wide-area systems with regional augmentations and they use satellite broadcast messages to transmit it to the users. What is the state of the art in this case, we have the American system, the white area augmentation system from the United States, we have from the Japanese system augmentation system and we have the Europe system, the European geostationary overlay service, all these three types of systems are operable. Then we have three other systems you see from India, the GAGAN systems, from Russia, the SDCM and from China, the SNAS system, these three systems are under development. And we have feasibility studies from South America, from Africa and from Malaysia for three other systems. You can see, we have in principle a global coverage concerning the systems and achievable horizontal positioning accuracy is between 0.5 and 3 meters and partly also with integrity information.

In principle a very good situation, but we have to look at the failures we have inside the system, the GNSS error sources. The orbit errors and the clock errors of satellites and also the influence of the atmospheric effects, that means ionosphere and the troposphere can be solved by the SBAS systems. But if you look at other sources, like for example the shadowing or multipaths that can be by buildings or by obstacles that we have, or the influence of interferences by other radio systems or the jamming or the spoofing, that means that other devices give us information or disturbance our signal, then we have the problem that it is not solved by SBAS systems, and in this case a solution could be [...] other sensors or, we have to use Ground Based Augmentation Systems as based of differential GNSS. These are in principle systems which can be support on a small scale or a local environment and they use additional terrestrial broadcast messages.

This is an example which was developed by DLR as part of the research port Rostock, this is an initiative of the German Government to support new GNSS applications, especially related to GALILEO, and here you can see the system how it is installed with two stations, a master station — a monitoring station — acting as a virtual user, and transmitting correction

and integrity information to the user inside Sahara, so it is possible to get an accuracy and a range of d up to centimetre with included integrity.

This is a monitor, and may we remember the slide at the beginning, and I have explained the signal you can use with difference colours and these are two services we support, one user is with GNSS, the second one is for two frequency users and as you can see for GPS, for the two frequency users, the signal is in green, that can be used and for the L1 users, the signal is in yellow, that means it cannot be used and this is in principle installed in time and you can use it.

This is an example of a new system, this is our outlook for the future. Here we can use it for example also for other systems like GALILEO, maybe also for COMPASS and other systems which are intended for the future.

How can we bring in our ideas now into an international community and therefore we embedded our solution into an international framework and this is called E-Navigation and this is intended in principle a strategy of the International Maritime Organization. And what is it? It is a framework and working programme for the harmonization of safety and operational, harmonization of the maritime information systems that we have, and you would like to use all electronic needs we have on board for safer navigation of the vessels and our initiative is integrated in a so-called PNT working group, PNT stands for Position, Navigation and Timing, and this is part of the work of IALA. IALA is an international association of E-Navigation and light order sources and here we bring in our ideas to standardize the solution and to fulfil the requirements I have shown you at the beginning of the presentation.

The key issues are the detection of malfunctions in core elements of navigation and the second one is a provision of support information, that means for example a warning or alert measurement and something like this and always should be harmonized concerning the equipment and the processes we have and why we are doing this? This is for safe, secure and efficient realisation of all processes inside the global maritime traffic system. Last, but not least, the question is, is it possible to avoid such pictures? Maybe the upper one you know this is the cargo vessel Rena after it was broken down in two pieces by New Zealand at the beginning of this year, the other picture is the Costa Concordia, the cruise vessel, you know it. And you can see here, around 50 per cent of accidents have navigational causes and on the other side 75 per cent of accidents are induced by human errors.

But it means 25 per cent are always induced by technical failures, and here we have to work on solution and this is in principle also addressed by the presentation that we are not looking only on the accuracy of the signals, we are looking also on the reliability of the signals, and in this case I offer you a good wish for your next journey on sea, and thank you for your attention. Thank you very much.

The CHAIRMAN Thank you Mr. Noack for your presentation. Is there any delegate who has questions for the presenter? Yes distinguished representative of Belgium, you have the floor.

Mr. J. F. MAYENCE (*Belgium*) Thank you Chairman. Just as with this morning's presentation which was thrilling, I would like to thank our colleague from Germany for this really interesting presentation. It's a very topical field and of great interest to us in Belgium and in Europe, I have the same question that I put to the speaker this morning, if I understood correctly, applications focused on safety of life, the safety of the vessel and environmental protection, would it be possible to expand these applications in a way where they would be to the goods as well? The merchandise? the goods being transported that is at risk, as we know as well, a container can fall into the sea and so forth and all of this a factor to be considered in planning the economic aspects of maritime transport, so that was my first question. And would it be possible to apply this type of applications to the goods transported as well, and also information on the positioning of the goods in real time, could it be used in conjunction with other types of information. For example, a monitor that would inform us in real time of the condition of the merchandise, for example if it is bananas that is being transported, are they rotten? Are they approaching a point where they would be over-ripe or are they fine. So this is to do with maritime commerce, and I would be very interested in the answers. Thank you.

Mr. T. NOACK (*Germany*) Thank you very much for this interesting question. To question 1, yes you can use it in principle also for the monitoring of the goods, it's not a problem, if you have the equipment then you can use it for that, the only problem is the price for the equipment, because in this case for a GPS receiver you have to pay maybe 5, up to 10,000 euro, and this is too much for every container you have on board, but on the other side, look on your mobile, you can see you have a very small chip inside this and this is a very very cheap device inside this and also equipped in principle to use it for satellite-based navigation, and if you could combine this technology for the monitoring of goods on vessels, then in

principle we combine both technologies to bring it, or to use it for economic aspects. I think it's possible but we have to look at the costs, here, we are looking more on the aspects if safety of life application, that is right, so in principle the money is not the driver for this, but for the economic aspects, yes I fully agree with you, you can use it and you should bring it in the new programmes so that we also combine both technologies to one technology and use it for other people we have.

The CHAIRMAN Thank you. Are there any other questions? I recognize distinguished representative of Indonesia, you have the floor.

Ms. E. S. ADININGSIH (*Indonesia*) Thank you. I would like to thank our colleague of Germany for a very interesting presentation. I would like to have a clarification on the your presentation regarding standardized solutions of the system. What are the components of the solutions including in the system, and my second question is do you also consider the interpretability and compatibility of any existing GNSS system in the work for such applications. Thank you.

Mr. T. NOACK (*Germany*) Thank you very much for this question, it is also a good question because this is in principle the question we are talking in E-Navigation about. You have different devices, and all the devices you can use on board have to bring together and one solution could be to say to the manufacturer we have to develop at the same manner, but this is impossible. So our idea is to develop so-called PNT unit, this is a unit for position navigation and timing information and after the devices we have, we have a processing unit and inside this unit is standardized in principles of processing of all the information we get from the devices outside. So it is possible to make a standardization of the equipment. In other cases, I think it's in principle impossible to do that. Thank you.

The CHAIRMAN Thank you distinguished representative of Indonesia and Germany. Are there any other questions of the floor. I see none. Thank you very much Mr. Noack.

The second presentation we will hear this afternoon is by Ms. Marianna Shepherd of the Scientific Committee on Solar-Terrestrial Physics (SCOSTEP) on "Work of the Scientific Committee on Solar-Terrestrial Physics (SCOSTEP)". Ms. Marianna Shepherd, you have the floor.

Ms. M. SHEPHERD (*SCOSTEP*) I am going to talk to you about activities which occurred under the

SCOSTEP Scientific Committee on Solar-Terrestrial Physics and I am it's scientific secretary.

I briefly will introduce to you its mandate, brief history, how it is governed and past and present programmes, which eventually lead to capacity-building and outreach and publications, and finally I want to point how SCOSTEP relates to the mandate UNCOPUOS.

The Scientific Committee on Solar-Terrestrial Physics is a not-for-profit organization, which is under the auspices of the International Council for Science (ICSU). And it is ICSU's only body charged with the long-term responsibility to promote international interdisciplinary programmes in solar-terrestrial physics. And it works to develop and sustain student interest in Earth-Sun connections, to promote efficient exchange of data information between solar and terrestrial scientists in all countries and seek projects and programmes which cross over traditional boundaries of physical regions and focused scientific disciplines.

SCOSTEP has more than 30 years of history and it started in January 1966 when the 11th General Assembly of ICSU, the Inter-Union Commission on Solar-Terrestrial Physics was formed, or IUCSTP. In September 1972, the General Assembly of ICSU IUCSTP was reorganized to a Special Committee for Interdisciplinary Solar-Terrestrial Physics programme of finite duration, and by September 1973, IUCSTP becomes what is known now SCOSTEP (Scientific Committee on Solar-Terrestrial Physics). In 1979 SCOSTEP got its constitution ratified by the ICSU General Assembly, under which SCOSTEP became a Scientific Committee of ICSU charged with long-term responsibility to promote international interdisciplinary programmes in solar-terrestrial physics. And in May 1982, the first General Council Meeting was held and the constitution as we know it now was adopted in 1988.

The SCOSTEP Governance in general is first lead by the Bureau, and the Bureau derives scientific, administrative and financial activities and selects the Scientific Secretary. In addition, there's a General Council, which is comprised of the adherent representatives; this is how SCOSTEP gets its funding to do its work, and the General Council reviews the scientific, financial and administrative activities of SCOSTEP and refers matters for further consideration to the Bureau. And finally we have more extended body, this is the International Science Discipline Representatives, which provide advice to SCOSTEP on scientific programmes, serve as links between national

and regional activities in their fields and SCOSTEP international scientific programmes and lead with SCOSTEP and through other ICSU bodies in proposing new programmes and participate in Steering Committees and projects of ongoing programmes.

SCOSTEP has a few of: Participating bodies, which starts with ICSU, then COSPAR, IAGA, IAMAS, IAU, IUPAP, IUGG, SCAR and URSI.

This is a representation of how SCOSTEP is organized. It starts with all day-to-day activities conducted to the Executive Officers; President, Vice-President and Scientific Secretary, which is present from United States, Germany and Canada. The Bureau is comprised of participating body organizations and currently we have representatives of Japan, Russia, US, UK, Italy and South Africa, and finally, there are 28 countries which are making the General Council.

SCOSTEP has some affiliates of ICSU Panel on World Data Centres, World Data Centre System, World Meteorological Organization, International Space Environment Service and again the National Adherent Representatives and Scientific Discipline Representatives, 55 scientists from 26 countries.

In the past, SCOSTEP Programmes have been very comprehensive, such that virtually all of SCOSTEP's energy and resources were dedicated to one major programme and when it started in 1976, those were three years durations and you can see here a list of International Magnetospheric Study: Solar Maximum Year, Middle Atmosphere Programme, Solar-Terrestrial Energy Programme, which ended | in 1997.

Between 1998-2002, SCOSTEP changed its format and started considering smaller dedicated programmes to individual disciplines and this ran in parallel: International Solar Cycle Studies on Solar Physics; Planetary Scale Mesopause Observing System (this is Middle Atmosphere Physics); Equatorial Processes Including Coupling, Equatorial Physics; and S-RAMP, which was a continuation of the earlier programme. In 2004, again we went to one single overarching programme which is called "CAWSES (Climate and Weather of the Sun-Earth System)", which is now in its second phase "Towards Solar Maximum" and it's going to end in 2013.

Just to give you a little timeframe of what has happened since the Ionosphere was discovered in the early 20th Century. Now we are here in [...] one and two and so you can see that the last 30 years have been pretty active and to start with the most recent

programme, the CAWSES strategy has been to collect data records to document with the increasing fidelity various aspects of the Sun-Earth system, use physically based models for assimilating observed data and deriving enhanced outputs for segments of the solar-terrestrial system, and mobilize SCOSTEP researchers to work together to understand variability throughout the entire solar-terrestrial system.

The motivation for CAWSES on one hand, that it is an international programme to enhance understanding of the space environment, and this comes through integrated systems approach, coordinated international activities — observations and modelling, involvement of scientists in developed and developing countries and educational opportunities for students. And on the other hand impact on life and society, in this sense: influence of solar variability on climate, sensitivity of sophisticated technology to fluctuations in geospace environment which lead to the need for operational forecasting and, impact of near space environment on human activities in space.

The current programme CAWSES II, is the major international programme as I said, and since 2013 and started fundamental questions of how the coupled Sun-Earth system operates on timescales of minutes to millennia and questions that require coordinated interdisciplinary international effort.

This should give you an idea about the four task groups on CAWSES II, which is solar influences on the Earth climate — TG1 — which investigates the [...] from above from the sun through the atmosphere. TG2 effects of climate on the geospace, this is from below to the outer space and, TG3 on solar variability effect on geospace environment. TG4 variable input from lower atmosphere on the geospace. All this four themes are developed through intensive international collaboration and inevitably includes capacity-building through training of young scientists. In that training informatics and e-science are major tools.

And this leads us to the capacity-building. SCOSTEP and CAWSES are co-sponsors of Space Science Schools run by the International Space Weather Initiative, and in 2010 it was held in Bahir Dar, Ethiopia. Sixteen countries participated in that workshop and it can give you the large support it got both from academia and space agencies. You will recognize many of those. In addition, in 2011 it was held in Tatranská Lomnica, Slovakia, and now in 2012 it will be in Bandung, Indonesia. We also received a grant from ICSU, a three-year grant, to help summer schools in Asia, Africa and South America, and this

also gives you an illustration of other schools in Japan, Peru and Taiwan.

We also have outreach programme which has been sponsoring by SCOSTEP through comic book, This is targeting the audience at large, and mostly young people, in particular, about issues in solar-terrestrial science.

This was an initiative of Professor Yosuke Kamide, of Nagoya University and originally was produced in Japanese, but now there are nine topics developed and the books are translated into 8 languages, and nine more undergoing translation.

We held various workshops and conferences and the results from those conferences are disseminated through the community and the audience at large through peer review proceedings and there are two books, each are to the CAWSES I, this is Kyoto Symposium 2007 and another one that has just been issues, this is highlights from the priority programme, the German priority programme 2005-2011.

SCOSTEP has a newsletter and each of the CAWSES team groups also have own work. Also we have a website.

So, finally, why we would like to become permanent observers to COPUOS. COPUOS reviews the scope of international cooperation in peaceful uses of outer space, devises programmes in this field and encourages continued research and the dissemination of information. On the other hand, SCOSTEP promotes/provides the necessary scientific framework for international collaboration and dissemination of the derived scientific knowledge and organizes/co-sponsors Space Science Schools which is an important capacity-building activity; future schools in Indonesia, South Africa, and South America.

SCOSTEP has high relevance and synergy to all COPUOS activities as applied to Sun-Earth connections. Therefore, it will be highly beneficial to have a stronger relationship between COPUOS and SCOSTEP, and on this I will thank you for your attention.

The CHAIRMAN Thank you Ms. Shepherd for your presentation. Is there any delegate who has a question for the presenter? No question?

Ms. M. SHEPHERD (SCOSTEP) Copies of this presentation can be found on table by the door for those who are interested.

The CHAIRMAN Thank you very much Ms. Shepherd for your very informative presentation.

Distinguished delegates, I will shortly adjourn this meeting. Before doing so, I would like to inform delegates of our schedule of work for tomorrow morning.

We will meet promptly at 10.00 a.m. At that time, we will re-open our consideration of agenda item 5, "General exchange of views", to hear two statements by delegations. We will also begin our consideration of agenda item 14, "Use of space technology in the United Nations system", agenda item 15, "Future role of the Committee", and agenda item 16, "Other matters", by firstly considering the applications for membership of the Committee and applications for permanent observer status with the Committee.

There will be two technical presentations tomorrow morning: by a representative of Japan entitled "Establishment of the International Center for Space Weather Science and Education at Kyushu University, Japan", and by a representative of India entitled "Megha Tropiques".

Expert group D on Regulatory Regimes and Guidance for Actors in the Space Arena of the Working Group on the Long-term Sustainability of Outer Space Activities will meet tomorrow morning from 9.00 a.m. to 1.00 p.m. in meeting room MOE100.

The Action Team on Near-Earth Objects will hold its third meeting from 10.00 a.m. to 1.00 p.m., this time in room MOE27.

There will be a meeting on the African Leadership Conference, held tomorrow, from 9.00 a.m. to 10.00 a.m. in room MOE13. Delegations of States of the African Group are welcomed to attend.

Also tomorrow, directly after the conclusion of the morning meeting, the Chair of the Working Group on Long-term sustainability of outer space activities will hold an informal briefing for all delegations on the activities of the Working Group on the long-term sustainability of outer space activities, and its expert groups. The briefing will be held in this conference room, following the plenary at 1.00 p.m.

Are there any questions to this proposed schedule? I see none. I will give the floor to Secretary, you have the floor.

Mr. N. HEDMAN (*Secretary*) Thank you Mr. Chairman. Delegations will recall that we will use time efficiently while we are having interpretation services, so immediately after the adjournment of the plenary meeting, Ms. Marboe of Austria will conduct informal consultations here in this conference room, and at 6.00 p.m. delegations are cordially invited to the reception hosted by the United States in the Mozart Room of the VIC Restaurant.

The CHAIRMAN Now, this meeting is adjourned until 10.00 a.m. tomorrow morning. Thank you very much.