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

Script

867th Meeting

Friday, 12 April 2013, 10 a.m.

Vienna

Chairman: Mr. T. Brisibe (Nigeria)

The meeting was called to order at 10.16 a.m.

The CHAIRMAN: Good morning distinguished delegates. I now declare open the 867th meeting of the Legal Subcommittee of the Committee on the Peaceful Uses of Outer Space.

Distinguished delegates, today, 12 April, we celebrate the International Day of Human Space Flight, as declared by the General Assembly. This day commemorates one of the greatest triumphs of human progress, the first space flight by Cosmonaut Yuri Gagarin, that paved the way for worldwide human space flight endeavour and exploration.

This morning we will continue our consideration of agenda item 3, General Exchange of Views, and we will begin our consideration of agenda item 7, National Legislation Relevant to the Peaceful Exploration and Use of Outer Space.

We will also continue our consideration of agenda item 11, General Exchange of Information and Views on Legal Mechanisms Relating to Space Debris Mitigation Measures, Taking into Account the Work of the Scientific and Technical Subcommittee.

At the end of our meeting this morning, there will be a special presentation on the International Space Station by Mr. William H. Gerstenmaier, NASA Associate Administrator for Human Exploration and Operations, and Chair of the Multilateral Coordination Board of the International Space Station.

Today, directly following the conclusion of our meeting this morning, the Office for Outer Space Affairs will launch the second edition of an online autograph album entitled "Messages from Space Explorers to Future Generations", which contains copies of signed sheets with messages from space explorers to future generations. This is a collection which the Office intends to grow in all of the official United Nations languages. The speakers of this launch event will be Madam Mazlan Othman, Director of the

Office for Outer Space Affairs, Mr. Dmitry Gonchar, Head of the Russian delegation to the fifty-second session of the Legal Subcommittee and Deputy Head of the Legal Department of the Ministry of Foreign Affairs of the Russian Federation, and Mr. William H. Gerstenmaier, NASA Associate Administrator for Human Exploration and Operations, and Chair of the Multilateral Coordination Board of the International Space Station.

After these speakers, there will be a screening of a documentary which takes us on a tour of the orbital laboratory of the International Space Station. The duration of the documentary is 25 minutes. This event will take place here in Board Room B directly after our meeting this morning.

I would also like to remind you that the Secretariat has distributed the provisional list of participants in Conference Room Paper 2. Delegations are kindly requested to provide the Secretariat with written amendments to the provisional list of participants by Wednesday, 17 April so that the Secretariat can finalize it.

Distinguished delegates, before we proceed with our work this morning, I would like to inform you of an administrative step that we will take after going through the items listed for deliberations this morning and before the special presentations which I just announced to re-open agenda items 4, 6(a), 6(b) and 8 in order to hear statements from Venezuela and open item 10 on capacity-building in order to hear a statement from China.

General exchange of views (agenda item 3)

Distinguished delegates, I would now like to continue our consideration of agenda item 3, General Exchange of Views.

I do not have any speakers on my list.

Are there any delegations, any speakers on the general exchange of views at this time?

I see none.

We will, therefore, continue our consideration of agenda item 3, General Exchange of Views on Monday morning.

National legislation relevant to the peaceful exploration and use of outer space (agenda item 7)

Distinguished delegates, I would now like to begin our consideration of agenda item 7, National Legislation Relevant to the Peaceful Exploration and Use of Outer Space.

Likewise, I do not have any delegations or speakers on my list.

Before we turn to the list of speakers, I would like to inform delegations that this afternoon under this agenda item, we will consider the revised text of the draft recommendations on national legislation relevant to the peaceful exploration and use of outer space, as contained in document A/AC.105/C.2/L.289.

I would like to give the floor to the distinguished representative of Ukraine.

Ms. N. REDCHYTS (Ukraine) (*interpretation from Russian*): Thank you Mr. Chairman. First of all, let me congratulate all participants in the fifty-second session of the Legal Subcommittee on the International Day of Human Space Flight. We wish you every success in developing international space law for the benefit of all of us.

This delegation would like to speak on the agenda item regarding national legislation on the use of outer space. Space activities in Ukraine are regulated by the Constitution and a number of specialized laws, as well as international treaties to which Ukraine is a Party. The most important legal instrument creating the legal framework for our space activities is Ukraine's Law on Space Activities of 1996. In developing that Law, we took into account the fundamental provisions of the United Nations outer space treaties and the overall Principles of space activities. The Law has been updated on an ongoing basis as space activities evolve. The last update was applied last year.

Let me note also that at present Ukraine has recognized the need for State regulation of certain

aspects of space activities. In this regard, the Ukrainian Space Agency has initiated work jointly with other ministries and government departments as well as interested non-State actors of space activities to draft a new Law with regard to government regulation in the domain of space-based remote sensing of the Earth and regulation of satellite navigation activities. These drafts are being prepared as we speak and in the near future we hope will be enacted by Ukraine's Parliament. Once they are adopted, Ukraine will be happy to submit the texts to the Office for Outer Space Affairs.

Thank you very much.

The CHAIRMAN: I thank the distinguished representative of Ukraine for her statement and give the floor to the distinguished representative to Austria.

Ms. I. MARBOE (Austria): Thank you very much Mr. Chairman. First of all, the Austrian delegation would like to express its appreciation for the possibility to have now under this agenda item on national space legislation the opportunity to further exchange experiences and practices in member countries on national space legislation, including new developments. This would provide a very useful way of continuing the work which has been concluded last year under the Working Group but now we have the plenary and regular agenda. And, as we have seen already at this session, we heard a very interesting technical presentation by Belgium, by Jean-François Mayence, about current developments of amending a proposed amendment has been put together to adapt the new activities into the legal framework so adapt the legal framework to the new activities which have emerged since the enactment and entering into force of the Belgium Space Act which actually is a rather recent document and you keep track with the new developments so it might turn, and it is nothing to be ashamed of, that some things might have been overlooked and perhaps might have developed in a way that was not foreseen at the time of the drafting of the first version of the Act.

We can see now in the Belgian case that there is already after a few years and the need for amendment and this is, of course, this experience can be shared with other delegations. We are very grateful to the Belgian delegation to have this presented to us because it gives, of course, also the Austrian delegation food for thought if our law is still appropriate and will remain so for the next years. Thank you very much for this initiative, for this very interesting presentation.

I have one specific question regarding the definition of space object which should be clarified now in the amendment, namely that any object launched or meant to be launched in an Earth orbit or beyond. This is an interpretation in a way or we can say an adaptation of what is a space object which is an object launched or meant to be launched into outer space, whereas we have not defined outer space so far. So the Belgian solution is here to clarify that the Belgian National Space Act will only be applicable to space objects which are launched or are meant to be launched in an Earth orbit or beyond. So they would circulate at least once around the Earth, enter an Earth orbit or beyond so space exploration activities would also be covered.

But with their result and with the consequence that sub-orbital flights which do not reach an Earth orbit, which do not even once circle around the Earth will not be covered by the Belgian Space Act. This is a decision which was taken deliberately after several, I am sure quite extensive deliberation in the country, and it is notable because, of course, other European States will now have to think how they deal with sub-orbital flights.

And I would like now to put the question, if this is a problem, if other delegations consider this to be a problem, that in the United States a different approach has been chosen. My understanding the Commercial Space Launch Act has been amended to include sub-orbital flights. So it covered by the national space legislation. So I would really like to hear some views of delegations if they think this is a contradiction or if it is a conflict or would create problems in the future, if the European States decide to exclude sub-orbital flights from their National Space Act and the United States have taken a different approach.

Thank you very much.

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

Before I give the floor to delegations, I should also echo the statement of the distinguished representative of Austria with respect to the evolving nature of statutes implementing international obligations, an example of which we were privileged to witness delivered to us by the distinguished representative of Belgium, and in respect of which on the website of the United Nations Office for Outer Space Affairs, we have a schematic document which States are also encouraged to update on a regular basis with their legislative instruments.

I should also take the opportunity before giving the floor to delegations wishing to speak, and this is addressed especially to the distinguished representative of Belgium, that the amendments to the Act which was just referred to in the statement of the distinguished representative of Austria, does it constitute a difference or is it the same reference which is now reflected in the response to the question in the questionnaire pertaining to national legislation and practices concerning definition and delimitation which is currently contained in CRP.8. I think it would be useful to clarify this.

And on that note, I would give the floor to the distinguished representative of Belgium.

Mr. J.-F. MAYENCE (Belgium) (*interpretation from French*): Thank you very much Mr. Chairman. First of all, I wanted to thank the Austrian delegation for the interest it has shown in yesterday's statement. This is a fundamental issue for our work. Before responding to the question, I wanted to answer the Chairman's question which has to do with our reply to the questionnaire on national practices relating to the regulation of space activities.

As I explained yesterday, and this is a fundamental issue and I hope I made it clear, this is a legislative draft currently before us. I have no right to prejudge the final decision of the Belgian Parliament, of course, regarding this amendment to be possibly made to the Law in question. In our reply to the questionnaire regarding space practices, we pointed out that such an amendment is being considered but we would like to wait until it has been adopted by our Parliament because only then shall we be in a position to provide a definitive response.

At this point, on the matter of the definition and delimitation of outer space, we are monitoring the process very closely. Again, this is a process that is underway, not yet concluded, but we expect it to be concluded in the weeks to come or, at worst, in the months to come, but in any case this year.

Mr. Chairman, now with your permission, I would like to come back to the matter of the approach to this proposed revision of Belgium's Space Law. It is about deleting certain aspects such as sub-orbital flights. As my Austrian colleague correctly pointed out, it is a decision we came to after consultations within our Department authorized to monitor air traffic but also as a result of discussions that took place within the European Union. Sub-orbital flights are currently the subject of informal but active discussions in the

European Union to try and figure out how this type of activity must be regulated. Maybe you know that the great difference between air activities and space activities under European law is that space activities cannot be regulated by the European Union within its current existing legal framework. So it is different from air space in that regard.

The reflection that we had in Belgium to sum up the substance of the discussion with regard to sub-orbital flights is as follows. There are certain flights that qualify as such and certain Belgian institutions and agencies carry them out so it is not a theoretical matter but the question was, would it be judicious or advantageous for such sub-orbital activities to subject them to a regime that is the outer space legal regime as we know based on the existing outer space treaties?

For us, the question, therefore, is whether or not sub-orbital flights will benefit from a regime that involves State responsibility, liability for damages, registration of vehicles, freedom of exploration and so forth, everything that goes into outer space law. *A priori*, it would seem that the answer to that question is no. They would not benefit from such a regime being applied. That, without prejudging any of the decisions that will be made regarding the regulation of sub-orbital flights. It does not at all mean that sub-orbital flights are considered to be of no way interest and should not be regulated, just the opposite, in fact.

So that was the first answer I wanted to make. One part of that discussion is to decide whether or not sub-orbital flights will benefit from a space regime being applied to them and, as I said, it would seem to us that the answer to that is no.

The second part of the discussion is how to technically regulate sub-orbital flights or other activities given their specific characteristics because they use technologies that are not the usual or standard aeronautical or aviation technologies, a different type of engine and certain technical characteristics that cannot be inscribed within aviation activities as we know them. So that makes sub-orbital flight a special case, at least for Belgian aviation law. And here some work has been done within the European Union. I have already referred to that and the question really is how to guarantee the safety and security of these activities while we know that this not the type of activity that can be fully inscribed within the framework of aviation and the regulatory framework for aviation. So the matter is not to put it to one side, not to forget about it, but to try and leave it up to the competent authorities and define their competencies in that regard.

So in Belgium, that is the way we are going at the moment. We think that for the time being, that is the most appropriate way to address it.

The conclusion, Mr. Chairman, without prejudging anything regarding the regime that will eventually apply to sub-orbital flights, this is the thinking. Maybe eventually it will be decided that the space regime will apply or it will be a separate regime. All we know for now is that space law, as we understand it in Belgium, does not apply *per se* in its current form to sub-orbital flights.

Thank you.

The CHAIRMAN: I thank the distinguished representative of Belgium for that very detailed statement and also recall the caveat that you have raised with respect to the stage and legislative process has currently reached.

I now give the floor to the distinguished representative of the United States.

Mr. B. ISRAEL (United States of America): Thank you Mr. Chairman and I should thank the distinguished delegate of Belgium for his updates and explanations of the ongoing legislative process in Belgium with respect to its space law and also thank the distinguished delegate of Austria for calling the Subcommittee's attention to the Commercial Space Launch Act in the United States. I am not in any position to speak definitively on the Commercial Space Launch Act as I do not have the text in front of me at the moment, but I would just like to suggest that it does not necessarily embody a different approach than the approach taken by Belgium. My understanding is that the provision of the Belgian draft legislation under discussion relates to a definition of a space object for the purpose of that law and the provisions related to sub-orbital flights in the Commercial Space Launch Act and in the Federal Aviation Administration's Regulations promulgated pursuant to it do not purport to define a space object or to define what international legal regime is applicable, rather it provides for regulatory jurisdiction of the Federal Aviation Administration over sub-orbital flights.

Thank you Mr. Chairman.

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

I now give the floor to the distinguished representative of Spain.

Mr. R. MORO AGUILAR (Spain)
(*interpretation from Spanish*): Thank you Mr. Chairman. We have listened with great interest to the previous statements and comments with regard to manned sub-orbital flights. It is of great interest to this delegation as well. Thus, certain private entities in our country have shown an interest in this type of activity. Given the lack of international legislation or legal instruments governing sub-orbital flights because it is not governed either by space law or air law, it is up to each country to define how to regulate such activities within its own national legislation, space or aviation. In the case of the European Union, as the Belgian delegate pointed out, this would be a mixture of the two, but, of course, it is up to each country to really make these decisions even though there will be a community-wide effort in the European Union.

With regard to the special characteristics of sub-orbital flights such as the use of more powerful engines, elements of space flights, they overlap with some space activities, but, on the other hand, the fact that there are crews and passengers, there are many characteristics that fall within the aviation law category. So again, it is up to each country to define its own norms and legal standards but obviously it has to be in line with the existing international law.

Thank you very much.

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

Are there any other speakers?

I give the floor to the distinguished representative of Brazil.

Mr. J. MONSERRAT FILHO (Brazil)
(*interpretation from Spanish*): Thank you very much Mr. Chairman. I wanted to inform this august assembly of the fact that Brazil last year adopted a new National Programme on Space Activities which is planned for 20 years from 2012 to 2021 and what I would like to highlight here is that this Programme establishes as one of the objectives for our space activities the creation of a single law governing all space activities in Brazil. This work will be carried out in the months to come and by way of contributing to this work, the Brazilian Association of Aeronautical and Space Law has set up a Working Group authorized to create a draft, an outline of this single law governing space activities. This Working Group is considered to be an independent entity and it benefits from the

experience of the existing national agencies and entities with experience in this regard.

The Group will focus, as a first part of this work, on the study of existing legislation around the world currently in force in various countries around the world. So that will be the first task, the first challenge of this Working Group, to compile everything that can be used, the best practices, if you will, that will go into the first draft for the single space law of Brazil.

This work makes full use of existing models, on models being created. One such model is the model of the International Law Association, ILA, which worked for four years and has come up with a very interesting model for countries that look to regulate their space activities through national legislation. Another important reference point which might be very useful to Brazil is the work carried out here in the Legal Subcommittee of COPUOS.

As I said, it is being studied and this year or next year we plan to adopt these models as a foundation for the future draft Law on Space Activities for our country. I thought this information might be of interest to you.

Thank you very much Chairman.

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

Are there any other speakers on this item?

I give the floor to the distinguished representative of Austria.

Ms. I. MARBOE (Austria): Thank you very much Mr. Chairman. Also, our delegation would like to take this opportunity to inform the Legal Subcommittee about the progress for the codification process of a space law in Austria. After the entering into force of the Austrian Outer Space Act in December 2011, we are now in the process of formulating the Implementing Ordinance which is necessary for some provisions which are deliberately kept rather general in law in order to allow a more easy adaptation at a later stage but the first Ordinance is now under consideration, a first draft has been submitted for consideration and discussion in November last year and we hope that we will be able to finalize the discussion on this Implementing Ordinance this year.

Thank you very much Mr. Chairman.

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

At this stage, I should note that whilst we are discussing item 7, National Legislation Relevant to the Peaceful Exploration and Use of Outer Space, given the interventions and statements that have been made, it seems to me that we have now already an idea of the cross-cutting nature of how this implementation of international obligations through national statutes could have ramifications that impact on other items and issues that we are currently discussing such as the question on sub-orbital flights. I find that very interesting.

Distinguished delegates, if there are no further statements under this item, we will continue our consideration of agenda item 7, National Legislation Relevant to the Peaceful Exploration and Use of Outer Space, this afternoon.

General exchange of information and views on legal mechanisms relating to space debris mitigation measures, taking into account the work of the Scientific and Technical Subcommittee (agenda item 11)

Distinguished delegates, I would now like to continue our consideration of agenda item 11, General Exchange of Information and Views on Legal Mechanisms Relating to Space Debris Mitigation Measures, Taking into Account the Work of the Scientific and Technical Subcommittee.

The first speaker on my list is the distinguished delegate of the United States.

Mr. B. ISRAEL (United States of America): Mr. Chairman, we are pleased that the Subcommittee is continuing to exchange information regarding national mechanisms relating to space debris mitigation measures, as well as international mechanisms, such as those employed by ESA and other international organizations.

The United States has long recognized the importance of managing the creation and effects of space debris and those United States government agencies that participate in, and licence outer space activities, have a robust framework of statutes, regulations and internal policies that take into account space debris mitigation from the design stage of a satellite or space launch system to its end-of-life disposal. We provided a detailed overview of United States mechanisms during the forty-ninth session of the

Legal Subcommittee and I would like to provide an update.

Central to the debris mitigation efforts in United States missions of the United States Government Orbital Debris Mitigation Standard Practices which many will recall served as the basis for the Space Debris Mitigation Guidelines, developed and adopted by the Inter-Agency Space Debris Coordination Committee in 2002, and the COPUOS Space Debris Mitigation Guidelines, approved by the General Assembly in 2007.

The 2010 National Space Policy directs United States government agencies to continue to follow the United States Government Orbital Debris Mitigation Standard Practices, consistent with mission requirements and cost-effectiveness in the procurement and operation of spacecraft, launch services and the conduct of tests and experiments in space. Notably, the National Space Policy requires that the Head of the sponsoring department or agency approve any exceptions to the United States Government Orbital Debris Mitigation Standard Practices and notify the Secretary of State. NASA, the Department of Defence, and NOAA, all carry out this guidance through internal regulatory mechanisms.

In addition, those agencies that licence commercial satellites also have requirements in their licensing procedures that are intended to limit the creation and impact of space debris and these requirements are often complementary. These requirements for non-governmental activities were described in detail in our statement under this agenda item at the Subcommittee's forty-ninth session.

Mr. Chairman, I would like to offer some observations about why we and others invest so much in debris mitigation measures.

The United States is proud of its pioneering role and leadership in orbital debris mitigation. In 1995, NASA became the first space agency in the world to issue a comprehensive set of Orbital Debris Mitigation Guidelines. NASA is a founding member of the IADC and it has played a leading role in discussions of space debris mitigations in the IADC and in the Scientific and Technical Subcommittee of COPUOS since the topic became a standing agenda item in 1994.

In the IADC, NASA continues to play a lead role in researching and developing relevant technical standards. This work will continue to inform the Scientific and Technical Subcommittee so that the

United Nations Space Debris Mitigation Guidelines can be updated as appropriate.

We are encouraged that a number of States and intergovernmental organizations have developed debris guidelines applicable to their respective space activities and believe that the implementation by even more spacecraft operators is vital to the safety and long-term sustainability of space flight.

Let me explain why the United States takes these measures and makes these investments in debris mitigation. We do not do so out of a sense that they are legally required. Rather, we do so because of our strong interest in the safety and long-term sustainability of space activities and our judgement that these practices recommend sound approaches to debris mitigation. This distinction is important because we sometimes hear the view expressed that the solution to the debris challenge is to elaborate the Technical Debris Mitigation Guidelines into international legal obligations.

Based on our experience, we believe States are motivated first and foremost by enlightened self-interest in the safety and sustainability of space activities. We do not believe that the force of legal obligation is necessary for States to take measures to mitigate debris. As delegations are no doubt aware, approaches to mitigating debris are linked with evolving technologies. As technologies change, so do the available methods for debris mitigation as well as the cost-benefit trade-offs of doing so. Given the evolving technical aspects of debris mitigation and the practical, economic reality that existing platforms cannot be replaced overnight, we do not see the wisdom in ossifying debris mitigation standards in international law at this time.

Safety and sustainability in space are of paramount importance for the United States and we will continue to wholeheartedly support international cooperation to further debris mitigation technology and techniques.

Finally, Mr. Chairman, let me describe one more United States legal mechanism relating to space debris mitigation.

The Department of Defence is authorized by statute to share space situational awareness information and services with governmental, intergovernmental and commercial entities to improve the safety and sustainability of space flight. Space situational awareness services are critical to avoiding collisions in outer space that can degrade the space environment for

all. To date, the United States has concluded agreements to facilitate the provision of space situational awareness information and services with 35 commercial entities and negotiations with a number of governments are under way. We encourage all space-faring nations to explore entering into a space situational awareness-sharing agreement with the United States so that we can continue to improve the safety and the sustainability of space flight.

Thank you Mr. Chairman and we look forward to discussions on this issue.

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

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

Mr. P. WENNHOLZ (Germany): Thank you Mr. Chairman, distinguished delegates. Germany welcomes the widening of the scope of the Subcommittee's agenda item on space debris to legal mechanisms in general and the work of the Scientific and Technical Subcommittee.

The serious challenge which space debris poses to the peaceful uses of outer space justifies the broader consideration of regulatory mechanisms beyond the context of national measures relating to space debris mitigation.

Germany also appreciates the interconnection of topics from the Scientific and Technical Subcommittee with topics addressed on the agenda of the Legal Subcommittee. We regard the combined consideration of technical as well as legal aspects as a suitable way for facilitating productive discussions on the issue of space debris.

A recent study of the Inter-Agency Space Debris Coordination Committee, the IADC, the results of which have been presented to the Scientific and Technical Subcommittee in February this year, has shown that the space debris population in low-Earth orbit would be increasing even as the mitigation measures were almost uniformly applied.

Without the effective application of space debris mitigation measures and active debris removal, the availability of certain orbits for the peaceful uses of outer space could be seriously constrained in the long-term perspective. This underlines the high significance of mitigation as well as remediation of space debris for the preservation of the space environment for future generations.

These issues are currently being discussed within the scope of the Working Group on the Long-Term Sustainability of Outer Space Activities of the Scientific and Technical Subcommittee. The Working Group aims at elaborating a set of best practice guidelines in order to enhance the sustainability and safety of space activities. Germany contributes to that goal through its active participation in the Expert Groups of the Working Group.

Mr. Chairman, distinguished delegates, the ongoing work on the long-term sustainability of space activities in the Scientific and Technical Subcommittee has shown that this topic involves a number of regulatory issues that should be addressed by the Legal Subcommittee. Germany is, therefore, ready to work in a constructive manner under this newly-shaped agenda item with a view to identifying legal issues for further examination by the Legal Subcommittee.

In this context, particular attention should be given to the yet-to-be finalized Guidelines on Space Debris Mitigation, Space Operations and Space Situational Awareness, as well as the legal aspects of active debris removal.

The consideration of the eventually identified issues should serve the aim of facilitating the effectiveness implementation of the recommendation of the Working Group on Long-Term Sustainability of Outer Space Activities. The Working Group is scheduled to finalize it works on the Best Practice Guidelines in 2014 with the adoption of the Working Group report. On the basis of this report, we should work to agree on substantive topics, the consideration of which in the scope of the Legal Subcommittee, is essential for the safe and sustainable conduct of outer space activities.

Thank you for your kind attention.

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

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

I give the floor to the distinguished representative of Belgium.

Mr. J.-F. MAYENCE (Belgium) (*interpretation from French*): Thank you very much Mr. Chairman. The Belgian delegation would like to endorse what was said by the United States delegation on the advisability of having an international

instrument. Where we are now, even if the debris issue which is one felt as an urgent issue by governments, we think that a treaty could be counter-productive. Let me just illustrate what I am saying by telling what we are doing in Belgium with mitigation mechanisms for space debris.

What we need for now is an international reference standard. There are standards, there is IADC, there are mitigation guidelines, but there are some differences there so it is not always easy to handle. In Belgium, when we want to have a debris mitigation policy, we look at our national law whereby we can set conditions on operators. So if an operator then finds himself facing conditions, he either accepts them as such, complying, or he objects, he challenges them. And it is perfectly possible in Belgium law for an operator to appeal against any conditions imposed by the Administration. So the Administration's position is strengthened when it can show that its conditions being set on the individual or the operator, actually comply with international standards. I am not saying an international obligation, I am just saying standards. So for a country such as Belgium, with regulation capabilities for space activity but with no capacity to set up technical standards for space debris, imagine the value of international standards, international technical standards, based on the expertise and experience of the space-faring nations, the United States, the European Space Agency, other space agencies have their own standards and have expertise and experience which we would want to benefit from.

Belgium is very much in favour of an instrument, let us call it a legal instrument, one which is visible enough and accessible to justify any conditions the Belgian authorities want to impose on their operators. I am thinking of an ad hoc resolution from the United Nations General Assembly as we have in other areas, and space debris, I believe, should have its own resolution. That might be the ultimate outcome of our discussion on this item on national mechanisms but for Belgium, this is meaningful only if we manage to get uniformity and uniformity would be because any appeals or challenges from any operators against what is imposed by the authorities, there you have the underlying question, why are you imposing such and such conditions on Belgian operators where other countries do not do that? That is a legitimate question from an operator and the Belgian authorities would have to give an answer to avoid technological dumping, in other words, where you have stricter conditions in some areas and less stringent in others.

Today, and we have really thought about this in Belgium, and we have looked at it with other

departments, a treaty would be counter-productive because we are moving from the first phase which is ex-anti-debris reduction, in other words, creating conditions less likely to create debris moving there into removal or evacuation of debris. But we are right in the very beginning now. If we set technical conditions with a treaty, we just might end up not meeting all the needs and we could block things when it comes to reaching the evacuation phase.

While we want an ad hoc resolution for objectivity for once and for all for all States for standards to be applied, and at the same time, we think that a binding instrument at this stage would be pointless.

Thank you.

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

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

I give the floor to the distinguished representative of the Netherlands.

Mr. R. LEFEBER (Netherlands): Thank you Mr. Chairman and good morning colleagues. In different formats, we have been discussing this issue of space debris in the Legal Subcommittee. For a long time we have been waiting for the outcomes of the Scientific and Technical Subcommittee and, of course, we are very much aware that at the present time in Expert Group D, this issue is also discussed in relation to legal instruments and I suppose that we will want to wait for the outcomes of that Expert Group before we can take this matter further in the sense of developing a treaty, which we support and we are very much in support of developing a legally binding agreement on space debris.

However, before we can move to that point because we also know that there is no consensus to develop a treaty at this point in time in the Subcommittee, I was wondering what else we could do that would be useful? Possibly inspired by the seminar last night at ESPI, I think that one thing that the Legal Subcommittee could do is identify rules of general international law that are relevant for space debris and, as was also indicated last night in the seminar is, one particular rule that I consider rather ____ (?) and actually I consider applicable to space debris, and that is Principle II of the Rio Declaration that was adopted at the United Nations Conference on Environment and Development. It is, of course, included in a soft law

instrument but a soft law instrument is generally considered to reflect customary international law and can also be found in jurisprudence of the International Court of Justice as well as the International Tribunal on the Law of the Sea.

So Principle II reads as follows, States have in accordance with the Charter of the United Nations and the Principles of International Law, the sovereign right to exploit their own resources pursuant to their environmental and development policies and the responsibility to ensure that activities within their jurisdiction and control do not cause damage to the environment, of other States or of areas beyond the limits of national jurisdiction.

This is an interesting provision because we were also cautioned last night that we have to be careful in transplanting rules of general international law into space law which is then *lex specialis* of international law. I think the presumption should be though that rules of general international law apply to space law, space law being a *lex specialis* of international law. However, of course, you have to look at the language because the first part of this Principle refers to the right of States to exploit their own resources and when we are talking about resources in outer space, that is not their own resources, those are *res communis* as pointed out by Austria under the Outer Space Treaty and common heritage of mankind, of course, under the Moon Agreement.

But the second part of this Principle II, I think, is highly relevant. It says that States have the responsibility to ensure that activities within their jurisdiction or control do not cause damage to the environment of outer space or of areas beyond the limits of national jurisdiction. And I think we can all agree that outer space is an area beyond the limits of national jurisdiction.

And also if you look at the jurisprudence of the International Court of Justice and the International Tribunal on the Law of the Sea, in particular the International Tribunal on the Law of the Sea, then you will see that they apply this Principle by itself so the second part, the responsibility to ensure that activities are within their jurisdiction are controlled and do not cause damage to the environment or of other States or of areas beyond the limits of national jurisdiction, is applied by itself. It is not linked in that jurisprudence to the first part of this Principle.

I think this could be an interesting exercise by identifying these rules of general international law and then deconstruct them. Is it relevant for space law? Is

it relevant for the management of space debris in particular?

So this is the suggested approach under this agenda item.

Thank you.

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

I take the opportunity to ask that in the course of the very interesting description of ways and means by which this question can be addressed by the Legal Subcommittee, I recall during the meetings of the Working Group on the Status and Application of the Treaties, we touched upon related issues, as it were, because if I understand the statement correctly, not only are we looking at debris issues, for which you have drawn an analogy from the second resolution of the Rio Declaration, but also related to resources and common spaces. So perhaps the questionnaire on the status and application could be an appropriate platform to consider this question, which again, apparently is cross-cutting. And in that respect, it might be interesting to consider also, as a general statement, the Convention on the Regulation of Antarctic and Mineral Resource Activities.

Are there any other delegations wishing to make a statement on this agenda item this morning?

I see none.

We will, therefore, continue our consideration of agenda item 11, General Exchange of Information and Views on Legal Mechanisms Relating to Space Debris Mitigation Measures, Taking into Account the Work of the Scientific and Technical Subcommittee, this afternoon.

Status and application of the five United Nations treaties on outer space (agenda item 4), the definition and delimitation of outer space (agenda item 6(a)), and the character and utilization of the geostationary orbit, including consideration of ways and means to ensure the rational and equitable use of the geostationary orbit, without prejudice to the role of the International Telecommunication Union (agenda item 6(b))

Distinguished delegates, as I indicated earlier, I received information from two delegations to re-open certain items in order for them to make statements. I shall begin by re-opening our agenda item 4, Status and Application of the Five United Nations Treaties on

Outer Space, agenda item 6(a), the Definition and Delimitation of Outer Space, and 6(b) the Character and Utilization of the Geostationary Orbit, Including Consideration of Ways and Means to Ensure the Rational and Equitable Use of the Geostationary Orbit, Without Prejudice to the Role of the International Telecommunication Union, in order for the distinguished representative of Venezuela to make statements on these items.

Mr. M. CASTILLO (Bolivarian Republic of Venezuela) (*interpretation from Spanish*): Thank you Mr. Chairman and good morning to all.

I would like to thank you for bearing with us and allowing us to address this item this morning.

Mr. Chairman, my delegation believes that it is important to continue the review and update of the five United Nations treaties related to outer space and that, with a view to strengthening the guiding principles on space activities for States in that area, and in particular to strengthen international cooperation, making space technology available to our peoples and especially to maintain peaceful uses of outer space.

While the United Nations treaties on outer space have indeed contributed to regulate the legal framework for activity in the area, we must bear in mind the increasing technological progress as well as growing expansion of activities in outer space which shows that these instruments must be reviewed and updated so as effectively to deal with legal aspects related to development and progress in these activities.

Exploration and use of outer space are based on the principle of peaceful utilization of outer space. However, my delegation believes that the 1967 Treaty established a distinction between the Moon and celestial bodies, on one hand, and outer space as such on the other. Article IV not only comprehensively applies peaceful utilization on the Moon and celestial bodies, on such celestial bodies there is prohibition of establishment of military bases, installations, fortifications, testing of any types of weapons and the conduct of military manoeuvres. As to outer space, the obligation of peaceful use is only partial in accordance with Article IV, what you have is prohibition of placing in orbit around the Earth any objects carrying nuclear weapons or any other kind of weapons of mass destruction. Thus, the place or use in space of any other type of weapons is not specifically banned.

Accordingly, the applicable legal framework for outer space in and of itself does not guarantee protection against an arms race in outer space.

Therefore, it is of the essence to adopt adequate and effective measures allowing to prevent an arms race in space.

Furthermore, and as a consequence of technological progress in the area and expansion of activities in outer space, we need regulation on aspects of utmost importance such as space debris, collision of space objects with debris, and especially those with onboard sources of nuclear energy, as well as equitable and rational use of the geostationary orbit and other aspects.

With that prospect, my delegation believes that it is of the essence that this topic be discussed further in this Subcommittee. Lack of definition and regulation on these matters are such that in the future, we will not manage to maintain the peaceful use of outer space and this could become an obstacle for space activities of States.

Thank you.

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

I should give the floor to the distinguished representative of Venezuela and, for the sake of efficiency, it might just be best if the statement on item 6(a) and (b) are read one after the other. Thank you.

Mr. M. CASTILLO (Bolivarian Republic of Venezuela) (*interpretation from Spanish*): Thank you Mr. Chairman. Item 6(a) has to do with the definition and delimitation of outer space. The delegation of the Bolivarian Republic of Venezuela believes that, even though up until the present, there has been no controversy in legal terms regarding the delimitation of outer space. We must take into account the fact that the accelerated technological development and the progressive increase in outer space activities by States, its commercialization and growing participation of the private sector, make it necessary to envisage in a clear and specific way rules that would make it possible to delimit air space and outer space and have a clear-cut legal regime applying to the one and the other.

We are aware that the discrepancies among positions of member States make it more difficult to reach a definition that would be completely satisfactory to all. Therefore, this delegation believes it is necessary to keep the item on the agenda of the Subcommittee to continue analyzing and discussing it so that we might reach a consensus-based agreement that would in the future produce legal instruments that will provide legal certainty to States as to their

sovereignty over air space, guaranteeing full freedom of the use of outer space as outlined in the existing Principles.

In this regard, Mr. Chairman, we would like to thank the Chairman of the Working Group on this agenda item, Professor Filho of Brazil, for the work accomplished by that Group.

Now I am going to read out a statement on item 6(b).

The delegation of the Bolivarian Republic of Venezuela reiterates its support and respect for the principle of free access to outer space based on equality for the benefit of all States without any type of discrimination. In particular, we support the equitable and rational use of various orbital positions used by man-made satellites.

Special attention should be given to the equitable access of all States to the spectrum orbit resource in the geostationary orbit, recognized for its potential to promote social programmes to benefit the most underserved communities for education and medical assistance. Thus, as a way to guarantee access to the information and communication technologies making it possible for them to improve the connection to necessary information sources to strengthen social organizations and to dissemination and exchange knowledge without the commercial intermediaries.

Therefore, this delegation is of the opinion that the various orbital positions are a limited natural resource and, therefore, we must ensure their equitable and rational use and the method used to assign frequencies in that regard is of fundamental importance if we are to guarantee the compliance with international instruments that should not favour the technological powers that because of their capabilities and occupying this limited orbital resource, pushing aside those countries that are in the process of development and do not at the moment have the economic and technological capability to put satellites in orbit.

In this regard, to ensure the peaceful and sustainable use of the geostationary orbit, it is necessary to maintain this agenda item on the table before us so that it is analyzed and discussed within COPUOS in a purely inter-State framework through action teams, working groups or panels as necessary.

Thank you very much Mr. Chairman.

The CHAIRMAN: I thank the distinguished representative of Venezuela for his statements.

Capacity-building in space law (agenda item 10)

And distinguished delegates, I now open our item on capacity-building in space law, item 10, in order for the distinguished representative of China to make a statement.

Mr. Z. HU (China) (*interpretation from Chinese*): Thank you Mr. Chairman. The strengthening of capacity-building in space law is conducive to achieving the rule of law in outer space. The Chinese Government attaches great importance to this and has taken measures in multiple areas.

At present, China has developed a relatively complete and distinctive mechanism in capacity-building in space law. As a nationwide academic body, the China Institute of Space Law is responsible for providing unified coordination among government departments, the space industry and the space law community in their joint involvement and division of labour in academic research in space law, space law legislation and dissemination of knowledge in space law. A good interactive pattern has been created. These players are engaged in a common endeavour to improve the implementation of space treaties and domestic laws and regulations in space activities.

In 2012, the Chinese space law community hosted its first annual Academic Conference. Scholars in space law were active in making recommendations to space legislation and conducted research of such frontier issues as the Space Assets Protocol and the Global Satellite Navigation System.

The relevant government departments encourage and support the publication of “Monographs on Space Law” and have organized many seminars on international space law with the academia.

In 2012, the Chinese space law community participated extensively in international academic exchanges and successfully hosted the ninth Manfred Lachs Space Law Moot Court Competition. There has been a marked improvement in the line-up and performance of the competing teams.

Mr. Chairman, in space law development, I would like to make a special mention of Beihang University where the United Nations Regional Centre for Space Science and Technology Education is planned to be built. Beihang University has a long history of working in space law by setting up the first

Institute of Space Law in China and making periodic publications, *inter alia*, of the special editions of Aeronautics and Space Law and Management. Beihang University is planning to make space law research and teaching a unique and key project and provide customized training service to the relevant countries within the region.

Mr. Chairman, the Chinese delegation is ready to share with the international community China’s experience in capacity-building in space law. We also hope to learn the good practices from other countries and international organizations, strengthen the cooperation in this area and work together to strengthen capacity-building in space law and promote the rule of law in outer space.

The Chinese Government supports the Office for Outer Space Affairs’ active and leading role in this area.

Thank you Mr. Chairman.

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

I now give the floor to the distinguished representative of Luxembourg.

Ms, M. HOFMANN (Luxembourg): Thank you Mr. Chairman. For me it is a great honour to have for the first time the opportunity to represent the Government of Luxembourg. In the relation to our today’s subject, I would like just to inform you that in 2011, there was established a new Chair on Space Communication and Media at the Faculty of Law at the University of Luxembourg. And a special Masters course on satcom and media law is taking part since the time.

At the same time, I would like to add that the University of Luxembourg is organizing the second Conference on Current Issues of Communication Law which the second Conference takes part this May. So by saying that, I would like to thank you for welcoming Luxembourg among the members and observers in this distinguished Committee.

Thank you so much.

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

Technical presentation

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

We will now hear a special presentation on the International Space Station by NASA Associate Administrator for Human Exploration and Operations, and Chair of the Multilateral Coordination Board of the International Space Station, Mr. William Gerstenmaier. The presentation will last around 13 minutes and Mr. Gerstenmaier will be speaking in his capacity as Chair of the Multilateral Coordination Board of the International Space Station. This presentation is a contribution to our deliberations under agenda item 12, Review of International Mechanisms for Cooperation in the Peaceful Exploration and Use of Outer Space.

Furthermore, in relation to the International Space Station, next week we will hear a joint presentation on the "International Space Station: Intergovernmental Agreement" by the Space Agency partners of the International Space Station.

Mr. William H. Gerstenmaier is one of the individuals principally responsible for designing, developing, assembling and operating the International Space Station. The Multilateral Coordination Board of the International Space Station, which Mr. Gerstenmaier chairs was established to ensure coordination of the activities of the partners related to the operation and utilization of the Space Station.

I am very pleased to have Mr. Gerstenmaier with us today. During his career, Mr. Gerstenmaier has been, among other things, the Manager of Operations for the historic Shuttle/Mir Programme. He has also served as Deputy Manager and later Manager of the International Space Station Programme, responsible for the day-to-day management, development, integration and operation of the International Space Station. Currently, Mr. Gerstenmaier directs all aspects of NASA's Human Exploration of Space. In his capacity as Associate Administrator for the Space Operations Division, Mr. Gerstenmaier also directed the safe completion of the last 21 Space Shuttle missions that completed the assembly of the Space Station.

Against this background, I am honoured to welcome you, Mr. Gerstenmaier, to deliver a special presentation on the International Space Station to this Legal Subcommittee.

You have the floor Sir.

Mr. W. H. GERSTENMAIER (Chair, Multilateral Coordination Board, International Space Station): Thank you Mr. Chairman for that kind

introduction. It is my privilege to be here today to represent the men and women scientists and engineers from around the world that support space operations on a daily basis on the International Space Station.

It is a tremendous privilege for me to be here to discuss this topic with this august group today. So, again, thank you and thank for the privilege of my team allowing me to come here to represent on behalf of them.

When I learned recently that the United Nations COPUOS Legal Subcommittee would be starting a comprehensive review of the international legal agreements and other mechanisms for space cooperation, I wanted to come to Vienna myself to speak with you about it. I consider to this to be a very important topic, more important than perhaps you may realize.

I know the delegates in this room focus much of your attention on the treaties and principles that govern the exploration and use of outer space and how well nations are fulfilling their commitments. I am not a lawyer and a lot of people tell me that I am not always very diplomatic. I am an engineer but from my perspective, we are fulfilling our commitments very well and many of the reasons we are able to do so, it relates to the words behind me.

In four years, we will be celebrating the fiftieth anniversary of the Outer Space Treaty. The very first sentence of that very first Article of this Treaty states that space exploration and use shall be carried out for the benefit and in the interest of all countries irrespective of their degree of economic or scientific development. While these words may seem clear, it took a lot of us, the teams of engineers and scientists who run the actual space programmes, many years to appreciate those words and what they really mean and how important they are. Over time, we learned that international space cooperation is indispensable. We also learned how it really works and that these lessons were reflected in a United Nations Declaration that COPUOS adopted nearly 30 years later.

The 1996 Declaration on International Space Cooperation begins by repeating the words from Article I of the Outer Space Treaty that I just quoted but the next two paragraphs which you see on these slides provide some very clear practical explanations of what those words mean. States are free to enter into space cooperation agreements on terms they themselves consider fair and reasonable. States with relatively advanced space programmes should seek

ways to cooperate with States whose programmes are less advanced. They should also seek ways to cooperate with developing States.

At NASA, we take those words very seriously.

NASA is currently conducting cooperative activities with under 556 agreements with 120 countries and four international organizations. Why is international cooperation so important to NASA?

The demands of space flight, especially human space flight, require that we work as a team and use innovative and creative technology to allow us to operate in the harsh environment of space. We have learned that nations with less advanced space capabilities can find ingenious ways of using technology that we may have overlooked. For example, NASA may have a particular approach to a technical challenge that we have used for a long time. A developing nation could find a more innovative approach because they are not wedded to the past practice and they can take a fresh look at the challenge. This can result in what I like to call “disruptive innovation”. It is often a very good thing. The challenges we face in space exploration every day require us to collaborate in order to succeed. While NASA cooperates with other countries across the entire range of civil space activities, including Earth observation, space telecommunications, space science, like the Hubble Space Telescope and the Curiosity Rover, now exploring the surface of Mars, I want to focus our attention today on one of the best-known missions, human space flight.

NASA secured its place in world history with the Apollo Programme and its success in placing 12 astronauts on the surface of the Moon over a course of six landings. However, what is significant about Apollo for our discussion today is that it represented one of the last times NASA conducted a human space flight programme without significant international cooperation.

In March 1970, only nine months after Neil Armstrong set foot on the Sea of Tranquillity, President Nixon declared the future direction of the United States Programme would include six specific objectives. One of these was the following.

President Nixon was the first of many Presidents who set NASA on a course of sharing space exploration and space applications through international cooperation. Nixon said “our progress will be faster and our accomplishments will be great if

nations will join together in this effort, both in contributing the resources and enjoying the benefits.”

Since the end of the Apollo Programme, NASA has sought increasingly to involve other countries in human space flight activities. One of the best known early examples occurred in 1975 with Apollo-Soyuz, the docking of two spacecraft in Earth Orbit. The Shuttle was NASA’s first human space flight programme to involve extensive international cooperation, not only in the activities conducted on-orbit but in the design of the vehicle itself.

The prime example of such cooperation was Shuttle’s robotic arm. It was built and contributed by Canada. The Shuttle needed a robotic arm to move cargo in and out of the cargo bay. Another critically important contribution to the Space Shuttle was designed and developed by the European Space Research Agency, ESA’s predecessor. It was the orbital research laboratory called Spacelab.

Spacelab also represented cooperation among the 18 nations who developed hardware, conducted research and provided flight crew members. Spacelab components flew on 22 Shuttle missions between November 1983 and April 1998. In 1984, international cooperation in human space flight was taking on an entirely new level, one that was not possible without these previous cooperative activities.

That year, in his annual address to Congress, President Reagan announced that the United States would build and launch a Space Station with participation from Europe, Japan and Canada. For the first time, NASA would cooperate with international partners in designing, developing and especially operating an orbiting spacecraft. Space Station Freedom did not come to fruition as originally envisioned, but in designing and developing it, we learned many important lessons that made possible the vehicle and the programme that we have today, the International Space Station.

Most of these lessons involved engineering challenges but an equally difficult challenge was to develop a firm but flexible, legal foundation on which the Space Station Programme could be built. And in this respect, Space Station Freedom was an important pathfinder in 1988. The United States and 11 other States signed an Intergovernmental Agreement containing the legal arrangements for the Space Station. NASA also signed bilateral agreements with ESA, Japan and the Canadian Space Agency detailing how the Programme would be run.

What I found most striking about the 1988 agreements, was that the rules and mechanisms they provided were so encompassing and so flexible, they could be transferred with surprisingly few changes to the new agreements needed for the International Space Station. This was true, even though the partnership had been expanded to include Russia. Thus, as the International Space Station used much of the existing hardware designs of the Space Station Freedom Programme, it could also embrace the same legal framework.

As my career evolved from designing spacecraft to designing space programmes, I began increasingly to appreciate the need to not only get the engineering right but also to get the legal framework right. I was so impressed by the fact that NASA and its Freedom partners could transition to developing a completely different Space Station under entirely new agreements with an entirely new major partner, Russia, yet retain most of the provisions of the earlier legal framework. How was that possible? The answer lies in understanding that the legal framework agreements for space cooperation, like the Intergovernmental Agreement and the Space Agency Memorandums of Understanding for the Space Station Freedom and the International Space Station are most effective when they serve two purposes. First, they must remove legal uncertainties. Agreements needed to resolve difficult questions about legal authority, funding, exchanging of technical data and goods, intellectual property protections and so on. Programme officials need the assurance that such issues have been taken care of so they can focus on conducting the technical aspect of the space missions.

Second, the agreements need to give programmes a flexibility to make decisions based on data and experience and to respond quickly to challenges. In other words, do not establish a rigid, overly prescriptive legal framework. Let me explain by what I mean by returning to the story of how the International Space Station came into being.

At the beginning of this presentation, I noted the language from the 1996 Declaration urging States with varying capabilities to cooperate with each other and to negotiate agreements on fair, reasonable and mutually acceptable terms. This is what NASA sought to achieve with the Space Station Freedom. As you can see, initial work on Freedom began in 1982 and by 1992, it became clear that Space Station Freedom cannot be completed as planned. President Clinton directed that the Station be redesigned and Russia included as a new partner. But even political direction and the will to make it happen cannot change the laws

of physics. The truth is that neither Russia nor the United States and its Space Station Freedom partners knew exactly how to design, operate and re-supply a Space Station of this size and complexity with 15 partner States. But Russia knew how to conduct long-duration space flight on its Space Station Mir. NASA knew how to conduct shorter duration, highly complex space activities using our Space Shuttle to launch very large structural elements into low-Earth orbit and as Apollo-Soyuz proved, both of us knew how to dock with each other in space.

So we were confident that together we could launch and assemble a very large complex Space Station and that this cooperation would yield tangible benefits to the United States, Russia, Japan, Europe and Canada, and ultimately to humankind itself. So NASA and ROSCOSMOS initiated a complex new phase of international cooperation, the Shuttle-Mir Programme.

The Programme involved nine Space Shuttle flights that docked with Mir, eight Russian cosmonauts flying on the Shuttle and seven NASA astronauts flying onboard the Mir for long-duration increments.

As NASA and ROSCOSMOS gained experience working together in space, a new International Space Station was being designed using Russian-built modules to provide the initial foundation for power and communications. On this foundation, the partners added laboratories, robotics and support systems originally designed by NASA, Europe, Japan and Canada for the Space Station Freedom Programme.

We also had to develop totally new ways of operating. Control Centres around the globe need to cooperate seamlessly in order for the International Space Station to function every day.

In this way, Space Station Freedom and the Shuttle-Mir Programmes paved the way for the International Space Station. But this was a crucially important difference between these cooperative programmes and the International Space Station Programme. Freedom and the Shuttle-Mir were considered to be national programmes with international participation. In the International Space Station, each of our national Space Station Programmes is completely dependent on the others. For example, the partners currently rely on the Soyuz for crew rotation, while the Station could not have been assembled without the Space Shuttle.

Operating the International Space Station is like running a small city in the harsh environment of

outer space. Multiple countries are involved in operational decisions every day on a daily basis.

Let me take a moment to show you the magnificent achievements in space cooperation that the International Space Station represents.

I chose this picture to give you a sense of scale and this shows a football stadium or a soccer stadium depending on which country you are from, in Spain, and it gives you a feel for how large the Space Station is that we have actually constructed in space. The dimensions are huge and just amazing.

Next, I will show you a picture of the actual Space Station itself and I especially like this picture and the reason I do is because throughout my career, I started with NASA in 1977. I got to see many artists renderings of what the hardware was going to look like in space. I got to see many conceptual drawings but none of those are as worthwhile or as satisfying to me as the actual picture of the hardware in space that this represents.

This picture is also special and the fact that it shows the automated transfer vehicle from the European Space Agency docked with the Space Station. You can see it right here. And then you can see the Japanese cargo module also attached to the Space Station up on top. So at this moment in time, this is truly international cooperation. Russian vehicles bringing crew up, a Russian Progress Vehicle attached and a cargo vehicle from Japan and another cargo vehicle from the European Space Agency.

Another way to look at the complexity of the Space Station is to look at this chart. Since I am an engineer, I enjoy this chart. You may not enjoy this chart but it has lots of words. It does not have intricate legal terms associated with it but it has lots of modules and pieces. But if you take a look at what is in space, not only is it as large as a football field but it really has an unbelievable research capability. You can see the various modules that are up there. Now there's an Italian permanent module attached here which has some capability to it that was added later. There is the European module, the Columbus module that does research for the European Space Agency, the Japanese modules are here. It includes a back porch-type device where experiments can be taken outside and operated in the vacuum of space and the United States Laboratory is in here.

So, again, if you take a look at this, this is a tremendously complicated, sophisticated spacecraft and the other unique thing is that each country really

got to pursue the research that they wanted to pursue in their own way. They were not prescribed on how to do that.

A good example is the Japanese. They felt they wanted an exposed facility on the outside of the Space Station so they put a small airlock in their module so they can move modules from the inside of the Space Station to the outside to take advantage of the unique vacuum properties in space. That exists in no other research facility or module on board the Space Station but the Japanese, for their own reasons, chose to add that unique research capability, but the entire partnership can benefit from using that cargo capability.

And on this chart is what it is actually like on the inside of the Space Station and I think this is an important chart as well. This is what occurs every day in space and requires all the cooperation that occurs. We do space walks. We are getting ready to go and do a space walk in the next couple of weeks, a Russian space walk pretty soon. This is a United States space walk where we are reconfiguring the outside of the truss.

The other thing that is also amazing about this facility is all these modules. Many of them did not see each other until they go on-orbit so the basic standards, the basic engineering practices we put together were verified and tested on the ground and the first time we plugged these two components together was in space and, as you know, sometimes how difficult it is when you plug your computer into a new network, imagine the amount of practice that this occurred and how well this worked by this international team.

This is, again, some activities going aboard the Station. We actually replaced the insides of the computers onboard the Station. There are about 70 or so computers. Instead of replacing the entire computer, we are actually doing low-level card change-out(?). Here is Sineeta Williams who we will see later today in the video. She is operating some research on the outside of the Station.

And to me this is also another amazing picture for us. This is the Canadian arm and it is picking up a commercial private space vehicle, the Dragon Space Capsule from the Space Exploration Corporation in the United States.

So when we put together those original legal frameworks, could we have ever imagined that this arm would be grabbing a free-flying spacecraft developed by a private company in the United States? I do not

think anybody could envision that but yet our framework was flexible enough, was amble enough that we could actually accomplish this in space. And not only that, the arm was really not technically designed to pick up a free-flying spacecraft. It was more designed to actually move modules around from one fixed location to another so we had to work with the Canadian Space Agency to add additional redundancy(?) and additional capability into the module.

These are the countries that made it all possible and you can see that the different types of agreements here. Foreign ministries signed the IGA but space agencies and other government ministries are charged with implementing the cooperation. Implementation is done differently in each country, as you can see on this slide. So again, flexibility is important as we move forward, even in our legal frameworks.

This slide illustrates how the International Space Station partners have made the Station available for the benefit of developing countries and developed countries with limited space programmes. They gain access to the International Space Station through separate cooperate or commercial agreements with one or more of the partners on mutually agreeable terms. To date, 68 countries participate in research activities onboard the Space Station. This is an amazing list of countries.

Finally, I want to show you the transportation systems that launched the International Space Station and keep it operating.

As of today, government and commercial vehicles have flown to the International Space Station 133 times for construction, research and crew rotation. Moreover, flights to the International Space Station represent a significant portion of the global space transportation marketplace. While the flight rates vary from year to year, in 2012, of the 78 launches that occurred to space worldwide, 12 of those launches, or 15 per cent, were to the International Space Station, again, driving a tremendous amount of the launch market.

As you can see, the International Space Station represents an achievement of international space cooperation that is unmatched in terms of complexity and inter-dependence. As a result, the International Space Station that orbits the Earth today has changed considerably from the facility we envisioned when the agreements were signed in 1998.

This slide notes many of the key changes. For example, NASA did not provide the Habitation Module originally envisioned in the IGA. Instead, crew living quarters were positioned at locations in other modules. We and the other partners altered the design and sometimes the number of elements originally intended to be provided. The Space Shuttle Columbia was lost and for three years only the Soyuz crew vehicle could be used could reach the Space Station. But to me, from the perspective of NASA Programme Manager and today as Chairman of the Multilateral Coordination Board, they must accommodate and integrate these changes. Here is one of the most impressive things. The partners have made all these changes without changing a single word of the IGA or MoU. Tremendous foresight, tremendous insight was put in putting these basic agreements together that allowed us to continue to operate the way we do today with very little changes.

Instead, we worked to negotiate further agreements among ourselves to adjust for programme challenges and we can do this again because the legal framework agreements provided that flexibility. They give us the authority to do it and they recognized that we would need to do it. Indeed, the International Space Station legal framework has even enable some of the partners to use it by mutual agreement to leverage their International Space Station cooperation into the realm of exploration beyond the International Space Station.

For example, this past January, the European Space Agency and NASA announced a new Implementing Agreement under their existing MoU by which the European Space Agency would meet its share of the International Space Station operating costs in the 2016-2020 timeframe by designing and providing a service module for our Orion crew vehicle, part of NASA's new exploration programme now in development. This new cooperation provides yet another illustration of how important the international space cooperation has become as our world becomes more inter-dependent. It also underscores the central message that I want to leave with you.

As NASA's experience with international cooperation has grown, and as my own career has evolved from an engineer who worked exclusively with United States colleagues to one working with colleagues from around the world nearly every day, I have also grown to appreciate the importance of the legal structures that make space structures, like the International Space Station, possible. While I am no expert on the Outer Space Treaty or the other treaties, conventions and principles that you all deal with, I

recognize that these instruments provide the legal foundation for our national achievements in outer space but I also know that space cooperation has largely replaced space competition and a cooperation is pursued through the kinds of bilateral and multilateral agreements recognized in 1996 Declaration.

I, therefore, want to underscore the increasing importance of space cooperation agreements within the larger context of the international space law. Legal framework agreements, like the IGA, are so important in furthering the work being done by space agencies worldwide. To achieve this purpose, however, they need to be structured in ways that nurture and support this work rather than hinder it. We are learning that cooperation agreements work best when their primary aim is to remove obstacles and provide greater certainty for the conduct of space endeavours. They tend to fail when they intrude into technical issues or they prescribe how programmes should be run, or worse, seek advantage for one party over another, or simply put, limit the flexibility to grow and change as time goes on.

I am sure the International Space Station agreements represent only a few among the many examples successful international space cooperation agreements and mechanisms you will encounter in the course of your review. I hope you will have gained an increased appreciation as I have of the important role, not only in anchoring the legal principles embedded in the Outer Space Treaty, but also in facilitating programmatic and even technical solutions to difficult issues that can exist at the international level.

So I will end these remarks with an International Space Station salute to the Legal Subcommittee.

There you are. This picture was taken by the crews about a year ago and this where we are located today here in Vienna.

I am grateful for this opportunity to share these perspectives with you and I thank you for your attention and I will be happy to answer any questions that you might have.

Thank you.

The CHAIRMAN: I thank Mr. Gerstenmaier for your presentation.

Are there any delegates with questions for the presenter? Any delegations? This has been a very interesting presentation.

Distinguished delegates, allow me then to put a question to you. We will come back to the International Space Station, I suppose, but what types of other cooperative activities, to your knowledge, does NASA engage in besides the International Space Station, given that we have listened in context of our work programme are discussing a review of international mechanisms for cooperation in the peaceful exploration and use of outer space?

Mr. W. H. GERSTENMAIER (Chair, Multilateral Coordination Board, International Space Station): As I showed in the charts, we have an extensive number of agreements internationally with very many partners and cooperative activities. There are quite a few outside of human space flight in the scientific area. The Mars Curiosity Rover carries equipment and investigations on it from several countries. That is an excellent example of agreements and inter-relationships with each other. As we look to other countries for programmes, Chandrayaan-1 was an Indian programme that essentially was a lunar orbiter. We flew a small synthetic aperture radar on that spacecraft as well as a multi-spectral device and again we were able to actually with the Indians to get a very timely launch to get our hardware to space. So that is a prime example where they were the lead for the spacecraft. They did the lead for the development activities and we provided two small instruments that allowed us to get unique research in that aspect. So there are numerous examples we could go through and we can give you some details of what those are, but as I described throughout the talk, as I look forward, I cannot imagine a world where there will not be more and more international cooperation in all activities of space as we move forward.

The CHAIRMAN: Distinguished delegates, if you will allow me, I have a natural _____(?) for what you just described, how, considering that we are looking at mechanisms for international cooperation, how can a State that is just embarking on a space programme cooperate, for instance, with NASA?

Mr. W. H. GERSTENMAIER (Chair, Multilateral Coordination Board, International Space Station): I think that the thing that is important for a State that does not have an extensive experience in space exploration, to discount their ability to actually contribute. I think that is the biggest mistake they can make. They may not have a unique technology capability that we have. They may not be as sophisticated in certain areas as the more developed space-faring nations are, but they can still add tremendous expertise in areas that may augment what

we are doing. I mean, they have manufacturing capabilities that are better. They may have labour that is actually better for us and they may do things in different way. As I talked about with the Indian satellite to the Moon, that was a very different programme than NASA would have done. The satellite was designed to operate for just a very short period of time. It was not a classic NASA programme that had a tremendous amount of investment, a tremendous amount of testing prior to launch, but we actually learned a tremendous amount from the Indians in that activity where we would test things, probably more than required. We would drive up cost to make sure that we could ensure success one hundred per cent. Because they were resource-limited, they were very effective in picking just the critical test that needed to be done to make sure the spacecraft would operate. It gave us a chance, again, to see things in a different way, to see in a perspective from someone who came fresh into the new system and they did not come with the bias that says "we've always done it this way, we can't do it a different way". The developing countries can bring a new perspective, reinvigorate us, get us excited about what we are doing and actually help us move forward.

I think sometimes also as a developed space-faring nation sometimes we grow tired of what we are doing. We start to lose that enthusiasm for what we are doing. We do not marvel at what we see. The Space Station that you just saw here is phenomenal but we have lost that excitement. But then a new developing country that has not had a chance to see that for their people and their population to see something and to think that they are part of this bigger thing, what a tremendous inspiration that can be to that developing country. So it benefits us because we get excited from that enthusiasm. We are reinvigorated to go and do the challenging test and I also believe it helps the country. I think the strongest thing is do not discount what you can contribute and what your country can provide, even though you are not maybe as technology advanced, you still have a tremendous capability to really push and we need the best throughout the world to continue these activities we seen on these screens and things we talked about.

The CHAIRMAN: Thank you very much.

Are there any questions?

I see the distinguished representative of Mexico and then the distinguished representative of Venezuela and then Austria.

Ms. R. M. RAMÍREZ DE ARELLANO (Mexico) (*interpretation from Spanish*): Thank you very much for that excellent presentation. I will spare you my pronunciation of your last name. There are many opportunities for international cooperation. The Mexican Space Agency, where I work, recently signed an Institutional Bilateral Agreement with NASA related to training for human capital. We are referring to scientists, technical experts, technology and the Agreement is very important for us because it means that, since the Mexican Space Agency was only recently created with limited scientific and academic experience, this means steps forwards because it is bilateral cooperation and international cooperation. The Agreement for Human Resource Development and Training involves very interesting projects. It is fundamental, after all. The Curiosity, of course, is one of the big angles and I would like to thank you ever so much for that presentation.

Mr. W. H. GERSTENMAIER (Chair, Multilateral Coordination Board, International Space Station): Thank you. You have given a good example of the benefit of international cooperation. Thank you.

The CHAIRMAN: And I should give the floor to the distinguished representative of Venezuela.

Mr. M. CASTILLO (Bolivarian Republic of Venezuela) (*interpretation from Spanish*): Thank you Mr. Gerstenmaier for your presentation. It was terribly interesting and I am thinking of the comment that you made regarding contributions from developing countries in seeking new inspiration for any activities under way or to be carried out at the International Space Station.

I saw a list of countries that are in cooperation with the Space Station and I was wondering, is that information that is publicly available or is this information that you have to have access through a specific channel?

Thank you.

Mr. W. H. GERSTENMAIER (Chair, Multilateral Coordination Board, International Space Station): In terms of the number of countries participating in the basic activities, that is openly available and we can share that with you or have a representative share that information with you.

In terms of how a country participates with the International Space Station, we can also help you with that as well. The partners can sponsor participants and there is, again, the basic legal framework allows

that to occur and we can show you some of those agreements and how those activities occur if you are interested in participating in the Station and we can provide you some more detailed information on any of those areas if you are interested.

The CHAIRMAN: We have a question from the distinguished representative of Austria.

Ms. I. MARBOE (Austria): Yes, thank you very much. I would like to join my predecessors and congratulate you on this fascinating and inspiring presentation indeed which is very well placed at this point in time because we are just starting to discuss this new agenda item and I was indeed very well positioned here to inspire and motivate our discussions. Thank you very much for this.

I have a question because we here in the Legal Subcommittee are concerned, of course, primarily with the legal framework and drafting and crafting a legal regulatory regime of international cooperation. However, legal rules are also there for preventing conflicts but are not always successful in this. So my question refers to dispute settlement. Have you ever had disputes and have they been solved on the basis of the legal framework you mentioned? What is your experience with disputes? Thank you.

Mr. W. H. GERSTENMAIER (Chair, Multilateral Coordination Board, International Space Station): Yes, I can give you one example. Earlier in my career when I was Space Station Programme Manager, I was in charge of the Space Station Control Board which was a lower level implementation board. We just had the Columbia tragedy. We were not going to be able to assemble the Space Station the way the partnership had originally envisioned. We were going to have to alter the sequence of when modules went up. We were going to have to alter the way they were attached and assembled on-orbit and then we ultimately ended up with a different final configuration for the Space Station that did not include the Habitation Module. So technically we had to figure out, first of all, how all those things could work, what our degrees of Freedom were. We had many discussions on how to put all that together. We then technically came up with the plan of moving forward, we thought, but then the legal framework gave me, as Chairman of the Board, the legal framework basically said that I was to seek mutual consensus for agreement but it gave me the authority that if I could not receive mutual consensus, I had the authority as the Senior Integrator for the International Space Station to declare a configuration.

So that was in the basic framework of the agreement. So we had a multiple week discussion on what the final configuration was. We could not agree on the final configuration so I instructed my partners at that point I was going to use this clause in the legal framework and I was going to declare the final configuration.

I did that in the meeting and my partners said "wait a minute, we will talk to you about it later". So then I withdrew that final authority that I had and I worked with them on Saturday and Sunday and on Monday and by Tuesday we had final mutual consensus and we never had to resort to that actual implementation that was called on in the legal framework. The message there was it gave me the ability to move forward when we had to make a difficult technical decision. I was concerned if we could not agree as a technical community what the Station should look like, how could we ever get our politicians and Heads of Agencies Meeting to actually agree what the configuration was. So to me, this was fundamental. We needed to make this decision. I needed to move forward. I had the authority to do but I did not actually have to use that authority. I was able to get mutual consensus which is the way we wanted to operate.

But that is an example of where there was enough dispute resolution(?) in the documentation. I could use it appropriately but still achieve a coordinated responsive answer which is much more healthy than us just agreeing a particular configuration.

The CHAIRMAN: Are there any other questions for the presenter from delegations?

Distinguished delegates, then, on your behalf, I should once again express our appreciation for this excellent presentation which we have been privileged to learn from today. And thank you again Mr. Gerstenmaier.

Distinguished delegates, I will shortly adjourn this meeting of the Subcommittee.

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

We will meet promptly at 3.00 p.m. At that time, we will continue our consideration of agenda item 7, National Legislation Relevant to the Peaceful Exploration and Use of Outer Space, and agenda item 11, General Exchange of Information and Views on Legal Mechanisms Relating to Space Debris Mitigation

Measures, Taking into Account the Work of the Scientific and Technical Subcommittee.

We will also begin our consideration of agenda item 13, Proposals to the Committee on New Items for Consideration by the Subcommittee.

Are there any questions or comments on this proposed schedule?

I see none.

I should remind delegates that right now we will commence an event marking the International Day of Human Space Flight. The Office for Outer Space Affairs will launch the second edition of an online autograph album entitled "Messages from Space Explorers to Future Generations" and this event will take place here in Board Room B. The speakers of this launch event will be Madam Mazlan Othman, Mr. Dmitry Gonchar, and Mr. William H. Gerstenmaier. After these speakers, there will be a screening of a documentary which takes us on a tour of the Orbital Laboratory of the International Space Station.

The meeting is adjourned until 3.00 p.m.

The meeting closed at 12.25 p.m.