Report of the UNCOPUOS IISL-ECSL Symposium

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On the first day of the 55th Session of the Legal Subcommittee of the United Nations Committee on the Peaceful Uses of Outer Space (UNCOPUOS), the afternoon session was reserved for the joint Symposium of the International Institute of Space Law (IISL) and European Centre for Space Law (ECSL). Following some words of welcome by **Mr. Hellmut Lagos Koller**, the newly appointed Chairman of the Legal Subcommittee, **Prof. Tanja Masson-Zwaan**, outgoing President of the IISL and **Prof. Sergio Marchisio**, Chairman of the ECSL opened the event. This year's Symposium was devoted to the 40th anniversary of the entry into force of the Registration Convention, and examined this treaty in the context of today's practical issues *inter alia* mega-constellations, space debris and space traffic management.

The Symposium began with a presentation by **Mr. Alexander Soucek**, legal officer in the International Law division of the European Space Agency, on the *legal and practical considerations of registering mega-constellations and space debris*. After providing a brief overview of the Registration Convention, Mr. Soucek reminded delegates and attendees that there had been efforts since its entry into force towards a more uniform state practice, as demonstrated through *inter alia* UN General Assembly Resolution 62/101 on Recommendations on Enhancing the Practice of States and International Intergovernmental Organisations in Registering Space Objects (17 December 2007). In addition to the practice already developed by States in establishing and maintaining national registries of objects launched into outer space for which they retain jurisdiction and control, international intergovernmental organisations like the European Space Agency (ESA) have been active in developing internal regulatory frameworks and policies vis-à-vis space object registration. ESA was the first international intergovernmental organisation to declare acceptance of the Registration Convention in 1978 and has most recently updated its registration framework and register through the ESA Space Object Registration Policy. As Mr. Soucek noted, the registration of

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space objects is both a legal and practical matter, especially in light of the developments which have taken place, e.g. mega-constellations, aerospace vehicles and non-orbital objects, launches from orbital platforms like the International Space Station and the increase in space debris. The recent announcement by some operators to develop large satellite infrastructures in low-Earth orbit, commonly referred to as mega-constellations, represents a significant development in the space sector. Not only would these infrastructures require an increase in launch and orbital traffic as well as represent a paradigm change in the way satellites are manufactured and tested, but they raise a number of legal and regulatory questions *inter alia* access to spectrum, responsibility and liability and, importantly, registration. As Mr. Soucek highlighted, the latter point of registration of mega-constellations may be more of a practical issue than a legal one, i.e. would each satellite require to be registered or could there, for instance, be satellite batches. In addition to mega-constellations, a legal and practical issue of registration today is that of space debris. As defined (albeit non-legally) by the IADC, space debris is "all man-made objects including fragments and elements thereof, in Earth orbit or re-entering the atmosphere, that are non-functional". The crux of the question in the context of registration is whether debris can and should be registered, and if so, how. From a legal perspective, Mr. Soucek noted that the question of functionality, as included in the IADC definition, does not have a legal impact on registration nor on the State of Registry's exercise of jurisdiction and control: a registered space object ceasing to be functional while in Earth orbit or beyond remains registered, and objects that are non-functional *ab initio* should still be registered. Mr. Soucek concluded his presentation by discussing the possible legal aspects when fragmented objects are concerned and the registration consequences, as well as the current State practice on debris.

The next speaker, **Ms. Elina Morozova**, Head of International & Legal Services at Intersputnik International Organisation of Space Communications presented on the topic of *currently debated issues: registration of hosted payloads, in-orbit transfer of ownership and the future of notifications and pre-launch notifications*. Hosted payloads refer to a portion of a satellite, e.g. a sensor or communications transponder, which is owned by a person other than the primary satellite operator. As Ms. Morozova pointed out, there are in effect two options when it comes to the command and control of a hosted payload: (i) it can be operated through the host satellite in cooperation with the satellite's owner, or (ii) it can use a completely separate, dedicated system. Hosted payloads began in 1976 with the launch of three American Marisat satellites which were designed to support the needs of the United States navy. Hosted payloads can be distinguished from "dispensed" payloads. These are integrated with the host satellite which following launch then carries them to the desired orbit, ejects the payload so that they can power on and start their

own operations. There are numerous examples of hosted payloads' registration with the United Nations, most recently cubesats and "pocket cubes" being hosted by the UniSat 5 and UniSat 6 satellites registered by Italy in 2013 and 2014 respectively. Following this discussion on hosted payloads, Ms. Morozova proceeded to examine the question of registration in the context of in-orbit transfer of ownership. She provided three scenarios of such a transfer: (i) transfer within the State of Registry, (ii) transfer from the State of Registry to another launching State and (iii) transfer from the State of Registry to a non-launching State. The final issue addressed by Ms. Morozova was that of pre-launch notification, which is aimed at ensuring the safety and security of launches, improving space traffic management and the exchange and sharing of information among States as well as increasing the overall confidence and transparency in space activities. Ms. Morozova pointed to the Cosmic Study on Space Traffic Management carried out by the International Academy of Astronautics in 2006 which underscored the need for an effective pre-launch notification system. In addition to this, the report of the Group of Governmental Experts on Transparency and Confidence-Building Measures in Outer Space Activities in 2013 noted that pre-launch notifications are an example of some of the transparency and confidence-building measures which have already been implemented for space activities, and that States should continue to develop the practice of providing such notifications.

The next speaker was **Dr. Simonetta Di Pippo**, Director of the United Nations Office for Outer Space Affairs (UNOOSA) whose presentation on *registration of space objects with the Secretary-General* provided an insight into this question from the institutional perspective. Since the first register was established in 1961 in accordance with UN General Assembly Resolution 1721B (XVI), voluntary registration information has been provided by numerous States, the most recent at the time of the Symposium being from Azerbaijan on 7 December 2015. Dr. Di Pippo reminded delegates and attendees that as of 1 April 2016, there were 62 Parties and 4 Signatories to the Registration Convention as well as three international organisations – ESA, EUMETSAT and EUTELSAT – which have declared acceptance of the rights and obligations of the Registration Convention. It was noted that there are two UN registers which operate in a complementary way: the Resolution Register and the Convention Register (between both, 92% of all functional space objects have been registered). Some States have re-registered all of their space objects under the Registration Convention. As of 1 April 2016, 6,772 functional space objects had been registered under the Registration Convention and Resolution 1721B (XVI) since 1961. Dr. Di Pippo proceeded to provide some updated information on the extent of registration practice. She noted that of all "space nations", 74% had provided the Secretary-General with information on their space objects, and that there is a growing

divergence between "space nations" and "States of registry". The driving factors in this regard were also remarked which include the cost of launchers, cubesat development and the impact of the private sector. The question of unregistered space objects was also addressed: in effect, only 7% of functional space objects had not been registered between 1957 and the time of the Symposium which equated to only a few functional space objects not being registered each year. Linked to this, the reasons why space nations may not register was discussed. Such reasons may include the fact that the State in question is not a party to the Registration Convention, that even if the State is a party to the Convention, there may not be national regulation or legislation in place or perhaps because there has not been agreement on the State of registry when multiple launching States are involved. Dr. Di Pippo concluded her intervention by discussing UNISPACE+50 and the need for a stronger notification procedure. Additionally, she reminded delegates and attendees of UNOOSA's web-based treaty monitoring and verification tool developed in 2001 which allows States to identify whether a space object has been registered and ascertain the State of registry. She also explored the topic of national space object registries in the context of Article II of the Registration Convention, and provided some perspective on the future of registration practice. In this regard, she noted that the increase of activities such as LEO satellite operators will have a bearing on the previously mentioned divergence between "space nations" and "States of Registry". Further, attention should be had to the increasing trend of transfer of ownership, and the risk of confusion which may arise particularly as concerns legal matters like international responsibility.

Following Dr. Di Pippo's overview of the UN perspective on registration, **Mr. Clayton Mowry**, formerly of Arianespace and now at Blue Origin, provided the industrial perspective in his presentation on *launch providers: role and practice*. Mr. Mowry gave an overview of the global launch market, including the number of launches which had recently taken place with topic launch service providers like Arianespace. As Mr. Mowry pointed out, registration is not a major concern for launch service providers, but more directly affects the operators of the space object(s) within the payload of the launcher. This being said, it was clear that dialogue between the launch provider and space object operator remains important and will continue to be so as new developments take place in the space sector. This may be illustrated, for instance, by the previously cited example of mega-constellations. In addition to raising legal questions like registering such a large number of space objects, these infrastructures have a bearing on both the type of launcher used (and consequent legal aspects like Launching State(s)), as well as the rate of launches required to operate the constellation.

The penultimate speaker of the Symposium was **Prof. Olavo de Oliveira Bittencourt Neto**, of the Catholic University of Santos, Brazil, whose

presentation *registration and space situational awareness* again highlighted the breadth of practical issues raised by registration and the importance of the Registration Convention in international space law. According to the Space Safety and Sustainability Working Group in 2012, space situational awareness (SSA) is defined as "the comprehensive knowledge of space objects and the ability to track, understand and predict their future location". In essence, the purpose of SSA is to safeguard space-based system which, as Prof. de Oliveira Bittencourt Neto highlighted, represent fundamental assets to the sustainable development of all States. SSA today currently refers to the tracking of three main things: (i) space objects and debris; (ii) space weather such as solar storms, and (iii) near-Earth objects like asteroids. As Prof. de Oliveira Bittencourt Neto reminded the delegates and participants, SSA is critical to the long-term sustainability of outer space activities. Indeed, it allows for the provision of information on current space activities and their environmental impact, it contributes to the efficiency and safety of space activities and it enables the protection of valuable satellites and space-based systems. It also serves an important legal function: by increasing transparency, it in turn encourages compliance with international law. In practice, there is a growing number of governmental and non-governmental SSA initiatives, e.g. the US Joint Space Operations Center (JSpOC), the Russian International Scientific Optical Network (ISON), the European Space Agency's SSA programme and Brazil's Embrace programme. Moreover, there are several SSA bilateral agreements relating to collaboration and data-sharing. Prof. de Oliveira Bittencourt Neto highlighted that States and international intergovernmental organisations play an important role and should continue to provide applicable registration information to the United Nations in the context of SSA. Indeed, identifying space objects and ascertaining the relevant Launching State(s) is important for SSA initiatives. However, currently, problems arise due to the fact that several space-faring nations are not State parties to the Registration Convention, because many States do not maintain national registers or due to the fact that insufficient information is provided internationally. Prof. de Oliveira Bittencourt Neto concluded his presentation by underscoring the need for further international cooperation and joint efforts in developing SSA and comprehensive registration practices. He was also of the view that in addition to the Legal Subcommittee, a useful forum to encourage dialogue on these points would be the UNCOPUOS Scientific and Technical Subcommittee's Working Group on the Long Term Sustainability of Outer Space Activities (LTSSA).

The final presentation of the Symposium was given jointly by **Prof. Stephan Hobe** of the University of Cologne and member of the boards of both the IISL and ECSL, and **Dr. Peter Stubbe,** lawyer at the German Aerospace Centre (DLR) on the topic of *lessons from other regimes (telecommunications, aviation, maritime)*. A comparative analysis was given to the rationale for

registration under international law in light of the regimes governing space, maritime, aviation and telecommunication activities. Under space law, jurisdiction and control arises from national registration under Article VIII of the Outer Space Treaty 1967 and the Registration Convention. Under both maritime law (Article 91 of the UN Convention on the Law of the Sea) and aviation law (Article 17 of the Chicago Convention), nationality is derived from national registration. For international telecommunication regulation, the legally protected right to use an orbital/spectrum resource arises from the recorded assignment at the International Telecommunication Union (ITU). The speakers reminded delegates and participants that there were similarities across these four regimes as far as transparency and public awareness of registration. For space activities, this is the publicly accessible UN register. For the ITU, this is the Master International Frequency Register. Under maritime law, this is the flying of the flag of the State of nationality, while in aviation law this includes the Aircraft Registration System (ARS) and reports of registration as provided for under the Chicago Convention. In addition to discussing the divergence between jurisdiction and operation across all four regimes and with a view to ascertaining possible lessons to be learned for registration in the context of space law, the speakers addressed the question of the use of limited resources and current issues in this respect. For instance, in telecommunications, "paper satellites" continue to be a challenge for ensuring the equitable management of spectrum and ensuring that filings are actually used. To ensure the rational and conflict-free use of space, there needs to be greater risk management through effective collision avoidance which may be achieved through a SSA regime as Prof. de Oliveira Bittencourt Neto had discussed. The speakers concluded by hypothesising possible solutions, including amendments of the Registration Convention and the creation of a separate SSA regime with a link to the existing registration regime.

Following the presentations, delegates and participants were invited to provide questions and observations. **Mr. Hellmut Lagos Koller**, Chairman of the Legal Subcommittee closed the Symposium, thanking the IISL and ECSL for organising a very useful and insightful symposium and expressed his appreciation to all the speakers for their contributions. **Prof. Tanja Masson-Zwaan**, outgoing President of the IISL and **Prof. Sergio Marchisio**, Chairman of the ECSL offered concluding remarks. It was agreed that both the IISL and ECSL are valuable resources in the field of space law education and capacity-building, while the output from this symposium continues to be a helpful contribution to the work of the Legal Subcommittee. The presentations delivered during the symposium were made available on the website of UNOOSA at: www.unoosa.org/oosa/en/ourwork/copuos/lsc/2016/symposium.html.