

The Challenges in Drafting National Law for Space Activities – A Brazilian Experience

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The international space law regime mandates that individual states are both responsible and liable for their respective national space activities. This is one of the most important principles of space law which today faces numerous challenges in the regulation of many serious legal issues that have emerged in recent decades including, *inter alia*, space security, permanent sustainability regarding the use and exploration of outer space, global space governance, and cooperation between states regarding national development in space by the majority of states on all continents. In this context, the participation of all states, whether individually or multilaterally, is essential to achieve more effective advances in the progressive development of international space law. Indeed, international space law is now confronted with subjects as varied as the manufacture and deployment of small satellites, space debris, transfers of ownership of space objects while in orbit, space tourism, and the avoidance of flags of convenience in space activities, among others. While each state has the right to create its national policy and legislation for space activities, such legislation must be drafted in accordance with the requirements of both international space law and general international law. Consequently, nation states such as Brazil that intend to develop their national space industries and become launching states should draft national space legislation which promotes both the safety as well as provide adequate supervision and control of space-related activities within their respective territories. In the case of Brazil, the creation of a new general law regarding space activities in Brazil is outlined in its new National Space Activities Program (PNAE 2012-2021)

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issued by the Brazilian Space Agency in 2012. In order to assist the Agency in achieving this objective, the Brazilian Association of Air and Space Law (SBDA), through its Space Law Working Group, has been working since the beginning of last year (2013) to prepare a proposed project of Brazilian national space legislation in concert with the PNAE which takes into account the salient features of the space legislation of other national states as well as both the Sofia Guidelines and the Assembly Resolution on Recommendations on National Legislation Relevant to the Peaceful Exploration and Use of Outer Space. The objective of this paper is to examine the outcomes of these initiatives and to make recommendations that could incentivize other developing countries to consider undertaking similar programs.

I. Introduction

Answering the call of the Brazilian National Space Program (PNAE 2012-2021) and in accordance with the international responsibility of States for their national space activities and the current challenges faced by nations states to regulate their national space activities, the Brazilian Association of Air and Space Law (SBDA), through its Centre of Space Law Studies (NEDE), has created a Working Group¹ that has been developing a Project of the national law for space activities since the beginning of 2013 under the coordination of Professor José Monserrat Filho. SBDA is a non-profit civil organization founded in 1950 and was declared of public interest in 1952.² The Brazilian Project is, therefore, a non-governmental initiative.³ This paper will provide a broad description of the ongoing Project, analyzing several aspects of the Project and observing in tandem the current Brazilian space program and industry. Although the outcomes are still in progress, they are worth sharing with the international community in order to provide a model for other developing states to follow.

¹ The Members of the Working Group of Brazilian Space Law are specialists from around the world including Brazil, Canada, Italy and the Netherlands. The Members are: José Monserrat Filho (Coordinator), Adyr da Silva (President of SBDA), Alexandre Dittrich Buhr, Álvaro Fabrício dos Santos, Ana Cristina van Oijhuizen Galhego Rosa, Andrea Araújo, Carla Martins, Daniël Konrad Link, Felipe Piletti, Fernando Oliveira Pontes, Juliana Macedo Scavuzzi dos Santos, Olavo de Oliveira Bittencourt Neto, Pedro Ivo Seixas, Paulo Roberto Batista, and Tatiana Ribeiro Viana.

² For more information regarding the SBDA, see online: <<http://www.sbda.org>>.

³ This initiative was also presented at the 53rd session of the Legal Subcommittee of the UNCOPUOS, available online: <<http://www.oosa.unvienna.org/pdf/pres/lsc2014/tech-09E.pdf>>.

II. Current Scenario and Justification For A National Space Law Regime

II.1 *New challenges faced by nations which engage in space activities*

In the first decades of the Space Age, introduced by Sputnik-1 in 1957, space law was one of the most active branches of international law.⁴ However, in the last 35 years, in spite of the efforts of some states, there has been no single binding international space law instrument since the adoption of the Moon Agreement in 1979.⁵ Yet, recent advances in technology as well as the increased commercialization and privatization of space activities have created new types of these activities and introduced new space actors which should be internationally regulated in order to ensure their consistency with, and adherence to, fundamental space law principles.⁶ Consequently, new space activities and actors have been relying on states for regulation, and this reality should be no different in Brazil.

As explained by prominent Argentinian scholar Aldo Armando Cocca, space exploration has provided new opportunities to juridical sciences, through the great innovations linked to space activities.⁷ The economic, technological, political, and juridical implications of space activities oblige states to address at the national level many serious legal issues that have emerged in recent decades such as space security, permanent sustainability of the exploration and use of outer space, global space governance, and cooperation between states regarding the sustainable national development of space-related activities.

One of the primary challenges faced by the international community in this regard is to ensure the commitment of all entities engaging in space activities to respect the overall safety of those activities and their ongoing sustainability for the benefit of all countries and of all humanity; because outer space is the province of mankind, it should be considered as such and protected accordingly.

Since international space law may not provide sufficient tools to accommodate the impressive growth of space activities engaged in by private actors, there is a risk that some private individuals and organizations, due to

⁴ J.A. van Wyk, "Overview of the Implementation Status of the Five United Nations Treaties on Outer Space in African Countries" (October 2008), 12 African Skies/Cieux Africains 90, available online: <http://www.saao.ac.za/~wgssa/archive/as12/van_wyk.pdf>.

⁵ *Agreement Governing the Activities of states on the Moon and Other Celestial Bodies*, signed 18 December 1979, entered into force 11 July 1984, 1363 UNTS 3, 18 ILM 1434 (1979), [hereinafter *the Moon Agreement*].

⁶ Fabio Tronchetti, *Fundamentals of Space Law and Policy* (Springer: New York, 2013), 26 [hereinafter *Tronchetti*].

⁷ A.A. Cocca, "Prospective Space Law" (1998) 26 Journal of Space Law 1.

non-binding mechanisms in the application of space treaties, could follow the model of the naval industry by enrolling their space objects in states that have neglected to control and supervise such activities, generally for the purpose of attracting business. These actions are known as "flags of convenience" in the space sector, which may have serious consequences for the industry including an increase of space debris and the degradation of the space environment, both of which pose a risk to numerous present and future space missions as well as to space tourists. The establishment of national space law must, therefore, be promulgated in accordance with international treaties in order to avoid the occurrence of flags of convenience in space.⁸

III. The National Right to Create National Legislation And Policy For Space Activities

Space activities are regulated by public international law, in particular by the principles and resolutions contained in the five United Nations (UN) international space law treaties⁹ that have thus far been adopted by the General Assembly.¹⁰

Pursuant to Article VI of the Outer Space Treaty (OST), States Parties to the OST bear international responsibility for their national activities in space, including authorizing and continuously supervising the activities of their non-governmental entities. A state can provide the authorization and supervision of its space activities through its national legal system either through the implementation of one specific space act or through application of several different laws.

⁸ Frans G. von der Dunk, "Towards Flags of Convenience in Outer Space?" (Paper presented at IISL/ECSL Symposium, Vienna, 19 March 2012) [unpublished].

⁹ *The Treaty on Principles Governing the Activities of States in the Exploration and Use of Outer Space, Including the Moon and Other Celestial Bodies*, signed 27 January 1967, entered into force 10 October 1967, 610 U.N.T.S. 2015, 6 IML 386 (1967), [hereinafter *the Outer Space Treaty*]; *The Agreement on the Rescue of Astronauts, the Return of Astronauts and the Return of Objects Launched into Outer Space*, signed April 22, 1968; entered into force 3 December 1968, 672 U.N.T.S. 119; 7 ILM 151 (1968), [hereinafter *the Rescue and Return Agreement*]; *The Convention on International Liability for Damage Caused by Space Objects*, signed 29 March 1972, entered into force 1 September 1972, 961 U.N.T.S. 187, 10 IML 965 (1971), [hereinafter *the Liability Convention*]; *The Convention on the Registration of Objects Launched into Outer Space*, signed 14 January 1975, entered into force 15 September 1976, 1023 U.N.T.S. 15;) 14 ILM 43 (1975), [hereinafter *the Registration Convention*]; and *The Moon Agreement*, *supra*, note v.

¹⁰ The United Nations space treaties, principles and resolutions are available online: <<http://www.oosa.unvienna.org/oosa/SpaceLaw/treaties.html>>.

Presently, several states have enacted national space legislation.¹¹ According to Tronchetti, the reasons why a growing number of states have been enacting national space legislation include the dangerous nature of space and the objective of not violating a nation's international obligations or undermine its national security and policy interests.

As noted by Marboe, several issues must be decided by the national legislature in order to comply with a state's international obligation to authorize and supervise space activities such as, for example, the provisions of the United Nations Space Treaties regarding the authorization, registration, supervision and liability of space activities.¹² Apart from these issues, any national space legislation must also be enacted in accordance with the national space policy of its respective country, and indicate the source of competent authority to regulate its national space activities.¹³

The Brazilian Space Agency (AEB), created in 1994,¹⁴ is the competent authority to regulate the space activities in Brazil.¹⁵ It is a civilian public body that is part of the Brazilian Ministry of Science, Technology and Innovation. AEB coordinates the development of civilian space activities in Brazil, and is also in charge of elaborating and coordinating the National Policy for Development of Space Activities (PNDAE),¹⁶ "whose general objective is to further enable the country to solve national problems and benefit Brazilian society through the use of legal space activities."¹⁷ PNDAE establishes objectives and guidelines for national programs and projects related to space.¹⁸ In order to promote the function of the PNDAE, policy was created by the National Program of Space Activities (PNAE).

¹¹ Available online: <<http://www.unoosa.org/oosa/en/SpaceLaw/national/state-index.html>>.

¹² See I. Marboe and F. Hafner, "Brief Overview of National Authorisation Mechanisms in Implementation of The UN International Space Treaties" in Frans G. von der Dunk, ed., *National Space Legislation in Europe: Issues of Authorization of Private Space Activities in the Light of Developments in European Space Cooperation* (Koninklijke Brill, NV: Leiden, The Netherlands, 2011).

¹³ *Ibid.*, at 46

¹⁴ Created by Brazil Law n° 8.854/94, available online (portuguese version): <http://www.planalto.gov.br/ccivil_03/leis/L8854.htm>.

¹⁵ *Ibid.*, at Art.3, III, XIII.

¹⁶ Established by Brazil Decree No. 1,332, of December 8, 1994, available online (Portuguese version): <http://www.planalto.gov.br/ccivil_03/decreto/1990-1994/D1332.htm>.

¹⁷ For a discussion of space activities in Brazil, see Alvaro Fabricio dos Santos and Jose Monserrat Filho, "Toward a National Brazilian Center on Space Policy and Law Studies" (2007) 50th Proceedings of the Colloquium on the Law of Outer Space. 119-126, available online (Portuguese version): <<http://www.sbda.org.br/artigos/anterior/38.htm>>.

¹⁸ *Supra* at note 9, Annex 1, IV.

III.I. *National Program of Space Activities (PNAE 2012- 2021)*

PNAE¹⁹ follows the guidelines of the PNDAE, outlining the priorities and directives that guide the implementation of all space activities in Brazil. This new decennial period program is a result of the review conducted by the AEB of the outcomes of the three previous PNAEs (1996, 1998 and 2005).

The strategic PNAE guidelines, *inter alia*, are: 1) consolidate the Brazilian space industry; 2) develop critical technologies; 3) expand international partnerships by prioritizing joint technological development; 4) encourage funding of public and/or private partnerships; 5) improve domestic space governance integration; and 6) developing capacity building in space activities (such as the Science without Borders federal program). The PNAE also establishes the commitment of creating a general law for space activities. On this basis, the SBDA took the initiative for drafting the Brazilian legislation for space activities.

The PNAE's highest priority is to promote industrial progress. Brazil is a continental country rich in natural resources which need to be increasingly identified, studied, monitored, managed, explored, and protected in the best possible way, and space-related science and technology are essential to this effort. As a result, the industry has both a crucial and historic role to fulfill.

III.II *Brazil as a Launching State*

In 1961, Brazil established the Organization Group of the National Commission for Space Activities (GOCNAE), converted in 1971 to the National Institute of Space Research (INPE).²⁰ The first Brazilian space program – the Complete Brazilian Space Mission (MECB in Portuguese) was created in 1979. It established the construction of a launch vehicle (VLS-1), a launch center (Alcântara), and the manufacturing of two data collecting satellites (SCD-1 and SCD-2), which were launched in 1993 and 1998 respectively.²¹

Since 1964, Brazil has developed a series of sounding rockets called SONDA.²² The sounding rocket sub-program still exists and is now

¹⁹ Available online: <<http://www.aeb.gov.br/wp-content/uploads/2013/01/PNAE-Ingles.pdf>>.

²⁰ It was initially named GOCNAE, renamed in 1963 to CNAE, and finally in 1971 to COBAE.

²¹ Regarding the Brazilian space programme, see Olavo de Oliveira Bittencourt Neto, "Direito Espacial Contemporâneo" (2011) Jurua at 133-38; see also the Brazilian space programme history, available online <http://www.inpe.br/ingles/institutional/about_inpe/history.php>.

²² Regarding the Brazilian sounding rocket programme, see online: <<http://www.oosa.unvienna.org/pdf/pres/stsc2014/tech-44E.pdf>>.

benefiting from technologies developed for the satellite launcher sub-program. VLS-1 was the first Brazilian satellite launcher.²³ Additionally, three VLS-1 prototypes were assembled, and two lift-offs were accomplished from the Alcantara Launch Center (CLA): the V01 and V02 launches, known as Mission Brazil (in 1997) and Mission Almenara (in 1999). In 2003, during the Sao Luis mission utilizing the third prototype, there was a catastrophic accident.²⁴ After this episode, the launch pad was fully reconstructed, and the VLS-1 was modernized in cooperation with Russia. Its first certification launch is planned for 2015.

Brazil has two launch centers: CLA²⁵ and Barreira do Inferno Launch Center (CLBI).²⁶ The CLBI, built in 1965, is located on the Brazilian northeast coast, and maintains close co-operation with the European Space Agency as a tracking station for all Ariane launches from Kourou.²⁷ The CLA, inaugurated in 1990, is capable of launching solid fuel sounding rockets and research vehicles as well as satellites into low Earth orbit. It is also located on the Brazilian northeastern coast near the border with Ecuador. CLA's geographical position increases the Center safety conditions and allows for lower launching costs (which practically allows launches during the entire year)

AEB, created in 1994, coordinates the Brazilian space activities and heads the National System of Development of Space Activities (SINDAE).²⁸ According to the SINDAE, the Brazilian space institutions which are authorized to engage directly or indirectly in space activities are: 1) AEB, 2) the National Institute for Space Research (INPE),²⁹ which has the functions of studying and developing space applications; and 3) the Brazilian General Command of Aerospace

²³ The VLS-1 was designed for a payload up to 250 kg to reach the LEO orbit (up to 700km). It is composed of four solid fuel propulsion stages, and it belongs to the class of small launchers. For additional details, see online: <<http://www.iae.cta.br/site/page/view/en.vls1.html>>.

²⁴ Frans von der Dunk, *Current and Future Development of National Space Law and Policy* (Lincoln: University of Nebraska, 2005) at 44, available online: <<http://digitalcommons.unl.edu/cgi/viewcontent.cgi?article=1011&context=spacelaw>>; see also <http://usatoday30.usatoday.com/news/world/2003-08-22-brazil-rocket_x.htm>.

²⁵ Available online: <<http://www.cla.aer.mil.br>>.

²⁶ Available online: <<http://www.digi.com.br/users/clbi/>>.

²⁷ For additional information regarding CLA and CLBI, see Monserrat Filho, "Brazilian Launch Licensing and Authorizing Regimes" in *Proceedings – United Nations/International Institute of Air and Space Law Workshop on Capacity Building in Space Law* (2003) at 158, available online: <http://www.oosa.unvienna.org/pdf/publications/st_space_14E.pdf>.

²⁸ It was established by Brazil Decree no. 1953/96, available online (Portuguese version): <<http://prespublica.jusbrasil.com.br/legislacao/112231/decreto-1953-96>>.

²⁹ Regarding INPE, see its website at <<http://www.inpe.br/ingles/>>.

Technology (DCTA)³⁰ and its Institute of Aeronautics and Space (IAE),³¹ which focuses mainly on the development of sounding rockets and launch vehicles. Apart from these official institutions, there are also the following private institutions: 1) SBDA;³² 2) Aerospace Industries Association of Brazil (AIAB);³³ and the Brazilian Aerospace Association (AAB).³⁴

III.III *Brazilian Space Industry*

In 1993, the Brazilian Aerospace Industries Association was established to represent the interests of several Brazilian companies working in aerospace and space engineering, among them AVIBRAS (sounding rockets and missiles);³⁵ Aeroeletronica (avionics and other electronics); CENIC (composite materials);³⁶ Elebra/NORCAL Group (electronics); TECNASA (electronics for air navigation support, radar countermeasures); Mectron (defense systems); Digicon (transducers, precision mechanics), and AKROS (structural analysis and CAD).³⁷ EMBRAER³⁸, leader of the Brazilian aeronautical industry, recently entered the space sector by creating Embraer Defense and Security, which participated in the creation of the company Visiona Space Technologies, a joint venture with the Telecommunication company Telebras under the Brazilian Ministry of Communications.

The first Brazilian Geostationary Defense and Strategic Communications Satellite (SGDC), is currently being constructed by the French-Italian company Thales Alenia Space, under the supervision of *Visiona*.³⁹

In addition, Brazil has space cooperation agreements with other countries. For example, Brazil has an agreement with China regarding the China-Brazil Earth Resources Satellite (CBERS), a program for the research and production of Earth Resources Satellites set up in 1988, with the following satellites launched: CBERS 1 (1998), CBERS 2 (2003), CBERS 2-B (2007), CBERS 3 (launched failed in December 2013), and CBERS 4 (to be launched in December 2014). Presently, Brazil and China are developing and detailing

³⁰ Regarding DCTA, see its website at <<http://www.cta.br/>>.

³¹ See the website at <<http://www.iae.cta.br/site/index.html>>.

³² See the website (Portuguese version) at <<http://www.sbda.org.br/>>.

³³ See the website at <<http://www.aiab.org.br/english/>>.

³⁴ See the website (Portuguese version) <<http://www.aeroespacial.org.br/>>.

³⁵ Available online: <<http://www.avibras.com.br>>.

³⁶ Available online: <<http://www.cenic.blz>>.

³⁷ See Global Security report, available online: <<http://www.globalsecurity.org/space/library/report/2003/brazilspace.pdf>>.

³⁸ See the website at <<http://www.embraer.com/en-US/Pages/Home.aspx>>.

³⁹ See more about *Visiona* online at <<http://www.embraer.com.br/en-us/imprensaeventos/press-releases/noticias/pages/visiona-assina-contratos-com-fornecedores-do-sistema-do-satelite-geoestacionario-brasileiro---sgdc.aspx>>.

a Ten Year Plan of Space Cooperation (2013-2022), a project approved in 2013. In July of this year (2014) the Brazilian and Chinese Space Agencies (AEB-CNSA) signed a MoU⁴⁰ on Cooperation in Remote Sensing by Satellite Data and Applications. Brazil and Argentina are developing the project SABIA-Mar, a oceanographic satellite to be launched in 2019. Brazil also has promising cooperation with Germany (its oldest partner in the space arena), as well as agreements with France, Ukraine, Japan, Russia, Canada, among others.

Brazil is also giving special attention to small satellite programs, notably the AEB program to build them in universities and research centers. Of special note is the Space System for Research and Experiments with *Nanosatellites* (SERPENS) program.⁴¹ The NanoSatC-BR1 was launched this year at the Russian Yasny Launch base by Dnepr launcher. This CubeSat project was developed at the Southern Regional Space Research Center (CRS/CCR/INPE-MCT) in collaboration with the Space Science Laboratory of the Federal University of Santa Maria (LACESM/CT - UFSM), Santa Maria, Brazil.⁴² Three other cube satellites will be launched this year and in the beginning of 2015 from the Japanese Module Kibo of the International Space Station, thanks to a contract signed by AEB and the Japan Manned Space Systems Corporation (JAMSS), partner of JAXA (Japanese Space Research Institute): AESP-14, SERPENS, and UBATUBASAT are all made by students of a secondary school of Ubatuba, a city of the state of Sao Paulo.

IV. The Proposed Draft

The proposed draft of the Brazilian general law for space activities (Brazilian Project) is characterized by the respect for the international agreements adopted by Brazil, UN initiatives, and the introduction of innovative instruments necessary to enable the project to conform with aspects

⁴⁰ This is a Memorandum of Understanding (MoU) in the areas of remote sensing, telecommunications, and technology. The agreement is valid for three years and will be managed by the Center for Resource Satellite Data and Application of China (CRESDA) and the National Institute for Space Research (INPE).

⁴¹ For more information regarding SERPENS, see online at <http://mstl.atl.calpoly.edu/~bklofas/Presentations/DevelopersWorkshop2014/Figueiro_SERPENS.pdf>.

⁴² Regarding the NanoSatC-BR1 project, see online at <<https://directory.eoportal.org/web/eoportal/satellite-missions/n/nanosatc-br1>>; see also Nelson Jorge Schuch & Otavio Cupertino Durao, "The Brazilian INPE-UFSM NANOSATC-BR Cubesat Program", available online at <<http://mtc-m19.sid.inpe.br/col/sid.inpe.br/mtc-m19/2013/07.01.11.40/doc/Paper%20-%20IAA-CU-13-09-02%20-%20Nelson%20Jorge%20Schuch.pdf?metadataarepository=&mirror=iconet.com.br/banon/2006/11.26.21.31>>.

particular to the Brazilian model as well as the current challenges faced by space-related activities heretofore discussed.

IV.I *Sources of the Draft*

IV.I.I *International Space Law*

One of the most important sources of law for the Brazilian Project were the international space agreements ratified by the country, especially the UN Treaties and Principles on Outer Space, and related General Assembly Resolutions and Recommendations.⁴³ In addition to the space law treaties, resolutions, and other agreements adopted by Brazil, other international regimes also were considered such as the International Telecommunication Union (ITU) treaties, which also govern certain outer space activities⁴⁴.

Brazil has ratified four of the five major space law treaties;⁴⁵ adopted various UN resolutions and recommendations, and is also a Member State of the ITU and is thus bound by its regulatory regime. The obligation to respect the ITU regulatory system is a key aspect of the Brazilian Project. The country has a long history of compromise with the UN initiatives, and this tendency is even stronger regarding space activities. Indeed, the very first article of the Brazilian Project, which deals with the scope of application and jurisdiction of the law itself, states Brazil's commitment to, and adherence with, the international law regime adopted by Brazil, particularly the one established by the United Nations.⁴⁶

⁴³ *Supra*, note X.

⁴⁴ The ITU treaties regulate the radio frequencies and orbital positions that are essential to satellite communications.

⁴⁵ The Outer Space Treaty was signed by Brazil in 1967. It was approved in Brazil by Legislative Decree n. 41/1968. The National Decree 64.362 promulgated the treaty, and it was published in the Official Journal of the Union on 22 April 1969. The Rescue Agreement was approved in Brazil by Legislative Decree n.80/1972. It entered into force in Brazil in 1973 with the publication of the Decree n. 71.989/1973. The Liability Convention was promulgated in Brazil by Decree n. 71.981 and came into force in the country after its publication on 23 March 1973. The Registration Convention was adopted by Brazil in 2006, and approved by the Senate by Legislative Decree n. 1/2006 and n.120/2003 in the Deputies Camera.;see also José Monserrat Filho, "Brasil adere, enfim, à Convenção de Registro de Objetos Espaciais", available online: <<http://www.sbda.org.br/artigos/anterior/26.htm>>. The Moon Agreement was never ratified by Brazil, but was adopted by United Nations General Assembly Resolution n. 34/68 of 5 December 1979, being open for signature on December 18 of the same year, and entered into force internationally on 11 July 1984.

⁴⁶ According to the Brazilian Constitution, it is the exclusive competence of the National Congress to make decisions regarding treaties, agreements, or international acts which may create charges or burdensome commitments to the national patrimony. Therefore, depending on the time of its adoption in the country following the national

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Brazil is a peaceful country, and to illustrate its compromise with the peaceful exploration and use of outer space and the OST, the Brazilian Project introduced a broad concept of National Security into the Project, which was defined as the commitment “to the peaceful exploration and use of outer space and to the scientific, technological, industrial, economic, social and cultural development of the country as well as to protect the legitimate interests of protection, peace and welfare of the Brazilian population.” The link between national security and the commitment with peaceful national space activities reflects the national history of peaceful solutions of controversies and international cooperation. This national history of peace validates the idea that all Brazilian national space activities are undertakings of national security, either civilian or for defense. In this regard, civilian and defense space projects should intensively cooperate to promote Brazilian economic, social, political, and cultural development with transparency and commitment to peaceful purposes.

The Draft also introduced an actual and broad concept of ‘global security in outer space’, defined to include international treaties, public policies, programs, and international actions based on the Charter of the United Nations and its organs. This concept was designed to promote the permanent stability of international relations as well as international cooperation in the areas indispensable to the protection and preservation of the Earth, the space environment, and the sustainable national development of all nations.⁴⁷

Regarding the solutions of potential controversies, the international agreements adopted by Brazil and its domestic law will be used to resolve any dispute. By way of example, the Project specifically mentions utilization of the Permanent Court of Arbitration Optional Rules for the Arbitration of Disputes Relating to Outer Space Activities⁴⁸ as a viable option to resolve conflicts.

The Liability Convention was also used, together with the OST, in order to determine the responsibility and liability regime applicable in case of damages caused by a space object. The Brazilian Project went further than the provisions of this agreement by establishing the right of recourse of the

legislative procedure, some agreements took longer than others from the time of Brazil’s signature to the moment it comes into force in accordance with the Brazilian national law. Several provisions of the international space agreements adopted by Brazil were used in the Draft with the objective to establish general rules to be applied in the country regarding space activities, facilitating the application of the treaties, and promoting the rule of law in domestic space law, which is believed to create a safer environment to boost the development of the national space industry and to promote the attraction of international investors to the country.

⁴⁷ Brazilian Project, Articles. 1, 2, XVIII, XIX and Article 9.

⁴⁸ The Permanent Court of Arbitration Optional Rules for the Arbitration of Disputes Relating to Outer Space Activities.

Brazilian government against private operators in those cases where Brazil would be considered as a launching state.

The Registration Convention's obligations concerning the national registry of launched space objects and the provision of information to the UN Secretary General are both included in the Brazilian Project. AEB is in charge of managing and operating the national registry in cooperation with the Center of Special Operations (COPE), under the Ministry of Defence, and provides this information to the United Nations in coordination with the Ministry of Foreign Affairs.⁴⁹ The Brazilian Project also provides that the conditions of the national registry will be defined by specific regulation that still has yet to be created.

Several principles, declarations, and resolutions adopted by different UN General Assembly Resolutions were also considered in the project such as, but not limited to, the following:

- a) Declaration of Legal Principles Governing the Activities of States in the Exploration and Use of Outer Space (Resolution 1.962 (XVIII), 1963). These Principles were the basis of the OST and are, therefore, mentioned directly and indirectly several times in the Brazilian Project including the concern with the peaceful uses of outer space, respect of international law, national responsibility for Brazilian activities in space, the liability of launching states, and international cooperation, among others.
- b) Principles Relating to Remote Sensing of the Earth From Outer Space (Resolution 41/65, 1986). These principles encourage that the use of remote sensing activities be carried out for the benefit of all. This is especially true of developing countries, and the Draft has thus proposed, in accordance with current Brazilian policy on the subject, to grant free access to nationals to receive remote sensing images from public satellites.
- c) Declaration on International Cooperation in the Exploration and Use of Outer Space for the Benefit and in the Interest of All States, Taking into Particular Account the Needs of Developing Countries (Resolution 51/122, 1996). One of the objectives of national space activities, according to the Brazilian Project, is to promote international cooperation that prioritizes joint scientific, technological, and industrial development in projects of mutual interest. The idea is to stimulate international cooperation among countries in all levels of development pursuant to the provisions of the Declaration.

In terms of other UN recommendations and documents related to space, it is important to include the "UNGA Resolution 62/101 of 17 December 2007: Recommendations on enhancing the practice of States and international intergovernmental organizations in registering space objects", which

⁴⁹ Brazilian Project, Article 17.

proposed that states be required to report to the UN the transfer of ownership and control of a satellite in orbit. Although this is a current practice mainly in the geostationary telecommunications satellites area, there is presently no established international regulatory framework to deal with this subject, notwithstanding the potentially grave consequences that can result from satellite activities pertaining to responsibility, liability, and registration. States need to begin to deal with this problem, and the Brazilian Project included one article to regulate transfers of ownership and control of a satellite in orbit, requiring that such transfers be reported to the United Nations in accordance with the aforementioned Resolution.

IV.I.II Other National Space Laws

Several national space laws and regulations from other states were studied and used as a model to create the Brazil Draft. The initial idea was to establish a general body of space law in Brazil with basic principles and in accordance with those aspects of the international space law regime that had been adopted by the country and which could be used as a guide in domestic courts and the space sector. Although there has already been a law in force since 1994 which created the AEB,⁵⁰ as well as other administrative acts regarding licensing and authorization, there is thus far no general Brazilian space law in existence which regulates space activities in the country. Therefore, the national laws used most often as legal sources in the Draft were those that possessed the same principles of generality and simplicity in order to promulgate general rules for space activities in the country. The national database of the UN Office of Outer Space Affairs was an important tool in this regard, facilitating the research, exchange, and discussion of several documents among the members of the working group.⁵¹ Examples of national laws that were utilized include, but were not limited to, Australia, Austria, Belgium, France, Kazakhstan, Russia, South Africa, and Ukraine. In accordance with the Australian legislation,⁵² another relevant aspect of the draft was the delimitation of the legal boundary between air and space whereby outer space was defined to begin around 100 km.⁵³ This subject has been under discussion for many years at the oldest specialized Working Group

⁵⁰ Lei 8.854, de 10 de fevereiro de 1994, available online at: <http://www.planalto.gov.br/ccivil_03/leis/L8854.htm>.

⁵¹ National Database of the United Nations Office of Outer Space Affairs, available online: <<http://www.oosa.unvienna.org/oosa/en/SpaceLaw/national/state-index.html>>.

⁵² Australian Space Activities Act 1998, available online: <<http://www.comlaw.gov.au/Details/C2010C00193>>.

⁵³ Olavo Bittencourt has published a doctoral thesis on the subject: “Limite Vertical à Soberania dos Estados: Fronteira entre Espaço Aéreo e Ultraterrestre”, São Paulo: USP, 2011.

of the Legal Subcommittee of United Nations Committee on the Peaceful Uses of Outer Space (UNCOPUOS) with still no consensus among nation states. The chairman of this Working Group at UNCOPUOS is also the coordinator of the Brazilian Project, Professor José Monserrat Filho.⁵⁴ What was unique about the Brazilian approach is that the delimitation was promulgated in a specific article rather than in the definitions, as was the case with the Australian Act. The Group decided that the approach to establish a clear boundary between the air and space legal regimes could facilitate discussions regarding new space technologies that are able to fly in both areas and thus pose challenges regarding the applicability of the appropriate legal regime.⁵⁵

In this regard, the delimitation of outer space will also help to solve legal issues that currently exist concerning space tourism when it becomes necessary to regulate such activity in Brazil. International space law, as presently conceived, does not respond to a series of specific questions such as the definition of a space tourist, liability for customer damage, insurance, or resolution of space tourist controversies, and these are other important questions that must be addressed by national laws, at least until international space law undertakes its natural duty to regulate space tourism's global issues which can affect a number of countries.

The Brazilian Project, in Article 14, assured the protection of life in national activities that involve space transportation of passengers or space tourism. Additionally, both activities will be the subject of a new specific regulation to be created as part of the Brazilian National Space Regulation.⁵⁶

Article 14 also deals with the investigation of space accidents. While other national space laws provide rules for such investigations, the concern of the group was to protect Brazil's national space activities, taking into consideration the tragic accident in 2003, but simultaneously ensuring that the investigation of an accident should have as its primary objective the promotion of safety and security for national space activities.

IV.I.III Sofia Guidelines for a Model Law on National Space Legislation

The 75th Conference of the International Law Association (ILA), held in 2012 in Sofia, Bulgaria, adopted the Sofia Guidelines for a Model Law on

⁵⁴ The question of delimitation of outer space was included on the agenda of the Legal Subcommittee following a proposal made by France to the General Assembly in 1966. *Historical summary on the consideration of the question on the definition and delimitation of outer space*, Report to the Secretariat, at 2, available online: <http://www.oosa.unvienna.org/pdf/reports/ac105/AC105_769E.pdf>.

⁵⁵ Ram Jakhu, Tommaso Sgobba, Paul Dempsey, *The Need for an Integrated Regulatory Regime for Aviation and Space: ICAO for Space?* (Studies in Space Policy), ESPI (Springer New York, 2012).

⁵⁶ Brazilian Project, Article 14 (Commercial Space Activities).

National Space Legislation. This Model was used as a framework by the Working Group in order to facilitate discussions and delimit the number of subjects to be included in the draft, and was adjusted to conform to the national reality and necessities of Brazil.

The Group identified the desirability to improve coordination among all public institutions involved in space activities in the country, such as better integration between the National Telecommunications Agency (ANATEL) and AEB, for example. ANATEL is the authority that represents Brazil at the ITU, while⁵⁷ AEB is the central authority to coordinate civil national space activities. The Project improves the coordination between ANATEL and AEB⁵⁸ in order to better represent the needs of the country at ITU in terms of radio frequencies and orbital positions while respecting the boundaries of ANATEL jurisdiction previously established.⁵⁹

Additionally, the Brazilian program for small satellites was also included in the draft. Small satellites are open to a wide diversity of actors from states to students or amateurs, which represent a great opportunity for Brazil, but with possible serious implications for the space security and space debris issues, and these issues need to be addressed. However, in spite of the fact that there are many small satellite programs around the world for civilian and defense purposes that involve universities, research centers, and national, public and private companies, there are no specific regulations for this activity, nor is there even any certainty that a specific legal regime should be designed internationally or nationally. This matter is currently being studied by the Group.⁶⁰ For this reason, the Brazilian Project elaborated a provision, which mentions generally its small satellites program.

Finally, relevant examples of subjects which were present in both the Sofia model and the proposed draft include, but are not limited to the following: the scope of application, definitions, liability, and registration, among others.

⁵⁷ Law 9472/97, article 19, II, available online: <<http://legislacao.anatel.gov.br/leis/2-lei-9472#livroII>>. ITU is responsible for the international protection from harmful interference and distribution of orbital slots of registered assignments.

⁵⁸ AEB has the competence to issue legal opinions, and is represented at international forums in consultation with the Ministry of Foreign Affairs and the Ministry of Science and Technology in accordance with Law 9954/94, VI.

⁵⁹ *Supra*, note lvi.

⁶¹ For example, Resolution 757 of the ITU invited the World Radio Conference – 18 (WRC-18) to consider whether modifications to the regulatory procedures for notification of satellite networks are needed in order to facilitate the deployment and operation of these satellites, and to take appropriate actions based upon the particular characteristics of nanosatellites and picosatellites given their short development time and their low-cost. Resolution 757 (WRC-12) – Regulatory aspects for nanosatellites and picosatellites.

IV.I.IV Assembly Resolution on Recommendations on National Legislation Relevant to the Peaceful Exploration and Use of Outer Space (A/68/423)

In 2013, the UN adopted a General Assembly Resolution recognizing the importance and necessity of States to promulgate their national laws for space activities. The resolution established a few relevant recommendations, such as the desirable scope of application of respective national laws, including the launch of objects into and their return from outer space, the operation of a launch or re-entry site, and the operation and control of space objects in orbit.

The first Article of the Brazilian Project establishes the scope of application of this law, and it applies to all national space activities. National space activities are defined in Article 2 as the space activities carried out from the national territory or from abroad (partner countries) when promoted by national entities that are duly authorized and licensed. The Project doesn't mention citizens, since according to present domestic regulations, only entities, and not individuals, can be granted authorization to carry out space activities.

The Resolution further emphasized the requirement of states to regulate the authorization and licensing of different kinds of space activities by a competent national authority. Such an authorization, according to the General Assembly, should be carried out in accordance with UN treaties and recommendations in order to minimize risks to persons, the environment or property, and to avoid causing harmful interference with other space activities aligned, in particular, with the Space Debris Mitigation Guidelines of the Committee on the Peaceful Uses of Outer Space. Moreover, in accordance with the commitment to protect the space environment, property and persons, Article 3 of the Brazilian Project defends and promotes the UN initiatives regarding sustainable, safe, secure, and peaceful exploration of outer space for the benefit of all mankind. In terms of authorization of national space launchings, it is worth mentioning that such activity has already been regulated in the country since 2002 by '*Portaria*' n. 5.⁶²

The Resolution also mentioned that appropriate procedures should be included in the national laws to provide continuous supervision and monitoring of national space activities, including on-site inspections and enforcement mechanisms to encourage compliance of authorized activities. The proposed Draft vests the AEB with the supervision and control of the national space activities in accordance with Article 6 of the OST. Infractions against the draft

⁶² Portaria n. 5 Portaria n. 5, de 21 de fevereiro de 2002, sobre Autorização para Operações de Lançamento Espacial no Brasil. Licensing is granted in accordance with Portaria n. 27 de 20 de junho de 2001, sobre Licenciamento de Atividades de Lançamento Espacial no Brasil.

law and the other regulations of the Brazilian regulatory system for national space activities are mentioned in Article 19, which refers to specific new legislation to be created regarding this matter, irrespective of the criminal or civil sanctions that could apply in accordance with the domestic law.

Regarding liability claims, the recommendation was to guarantee appropriate coverage for damage claims caused by private national space activities; states could introduce insurance requirements and indemnification procedures as appropriate.

Finally, in cases of transfer of ownership of space objects while in orbit, the General Assembly recommended that continuing supervision and authorization requirements must be properly maintained in order to track any changes in ownership and control.⁶³ This provision has also been introduced by the Brazilian Project.

V. Conclusions

V.I The Challenges of the Draft

The most difficult challenge faced by the Working Group was to balance the international obligations of the international agreements adopted by Brazil with the Brazilian national space policy and the need to promote a national space industry as well as a safe environment for space activities. International space law has left to states regulation of many current issues in which international consensus has not been achieved. Therefore, the Group attempted to identify the new space activities, space actors, and space challenges which should be addressed by current general legislation for space activities in the country, and in accordance with the feasible space activities that could or at least should be carried out nationally in the near future. There was a clear concern to not create barriers to the development of the national space industry, and to be connected with current reality. Accordingly, the Draft dedicated one article to commercial space activities and their actors.

Brazil is a country that holds great future promise in the realm of space activities, including the possibility of becoming a launching state. However, it has not yet achieved some of these objectives. Although most of them are technologically and economically feasible, it is very difficult to regulate activities that will occur in the future, even when the future is near. Small satellites, for example, represent an important opportunity for the country to be among the major space faring nations. This industry has been stimulated

⁶³ Resolution adopted by the General Assembly on 11 December 2013 [on the report of the Special Political and Decolonization Committee (Fourth Committee) (A/68/423)] 68/74; see also Recommendations on national legislation relevant to the peaceful exploration and use of outer space area, available online: <http://www.oosa.unvienna.org/pdf/gares/A_RES_68_074E.pdf>.

in Brazil, and the Brazilian Project reflects this approach. However, small satellites are also a subject still being studied in several forums, such as the ITU, and which may lead to different conclusions regarding how they should be regulated. In this regard, the Project did not propose the establishment of a legal regulation for their regulation, at least not at present. This subject is just one example of a current challenge faced by any group which attempts to venture into the domain of creating national legislation for regulation of space activities.

Other matters, such as the threats to the Earth posed by asteroids, were included in the studies and discussions, but not in the Draft. Such topics can be revisited in the near future depending on the reception of this first initiative that tried to be factual and balanced, but also feasible. This project has a considerable distance to travel before being promulgated as actual legislation.

The Brazilian Project must be submitted to the National Congress to be approved by the national legislative proceedings. The following steps represent the expected way forward for the Draft: the SBDA will present the AEB, which in turn will submit it to the Ministry of Science, Technology and Innovation. The Ministry will then pass it to the Cabinet of the President of the Republic. The President of the Republic has legislative initiative power, and can submit any project of law to the National Congress. The Group anticipates that the President will eventually submit the project to the National Congress for approval, yet this will only represent the beginning of the discussions at the legislative houses in the country. Once finally approved, the Group truly hopes that the Draft will still represent the intent of the group, which is to propose a general law for space activities, to regulate such activities in Brazil, and to stimulate the development of a Brazilian space industry through the promotion of a safe environment created by the rule of law.

V.II *Recommendations*

Finally, when taking into account the Brazilian Project, it is noteworthy that some recommendations could act as an incentive for other states that are also drafting their respective national space legislation. Indeed, the Project could be considered as a revised version of the text regarding recommendations of national space legislation relevant to the peaceful explorations and use of outer space as drafted by the Legal Subcommittee Working Group on National Space Legislation of the UNCOPUOS.⁶⁴ The Draft basically addresses the following elements that should be considered by States when enacting their national space laws in accordance with their law and specific

⁶⁴ UN Doc. A/AC.105/2012/CRP.21, available online: http://www.unoosa.org/pdf/limited/I/AC105_2012_CRP21E.pdf.

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needs: 1) Scope of Application; 2) Authorization and Licensing; 3) Safety; 4) Continuing supervision of space activities; 5) Registration; 6) Liability and Insurance; and 7) Transfer of ownership or control of space objects in orbit.

In addition, national space legislation should be based on the principle of cooperation and mutual assistance amongst states, taking into consideration the interests of all nations involved. This approach would also help to prevent the laws of space faring countries from applying to countries that do not have their own national space law, and where international law is silent about certain aspects of space related activities⁶⁵.

In this regard, we certainly hope that sharing this initiative will be useful to other states, especially those whose economies are still in the developing stage.

⁶⁵ José Monserrat Filho “Por que e como criar uma legislação nacional sobre o espaço?”, available online: <<http://www.aeb.gov.br/por-que-e-como-criar-uma-legislacao-nacional-sobre-espaco/>>.

