

Scarcity in Space

The Spectrum/Orbit Trading Solution (?)

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Abstract

The spectrum/orbit is one of humanity's most valuable scarce natural resources. Access to orbital positions along with access to radio frequencies is a prerequisite for the operation of a satellite system. The rapid development of the satellite industry has driven a large portion of spectrum/orbit demand. To this effect, it is critical that these resources are managed as efficiently as possible. The fairly recent trend of spectrum/orbit trading allows spectrum users the flexibility to transfer part or all of their rights to third parties. This mechanism contributes to an economically efficient use of the spectrum/orbit resources, as they are to be used by those who value them the most. Allowing trading makes it easier for new players to enter the market and for space technology to develop. An increasing number of countries have adopted, or are in the process of adopting, this concept, in order to give market forces a greater role in the determination of how spectrum/orbit resources should be managed. The European Union (EU) in Directive 2002/21/EC as amended in 2009, obliges the EU Member States to ensure that undertakings may transfer or lease to other undertakings the rights of use of radio frequencies. The present paper studies how the spectrum/orbit trading is regulated from an international, European and national point of view. In this context, this paper explores whether the spectrum/orbit trading is compatible with the Outer Space Treaty, especially with the non-appropriation principle, as well as with the procedures set forth by the International Telecommunication Union.

1. Introduction

Spectrum/orbit trading is a practice, not extensively used, but increasingly growing, whereby operators may transfer or lease their right of use of an orbital position along with the associated radio frequencies, to a third party. This paper examines the legal framework that governs the use of the spectrum/orbit resource as well as the conformity of the spectrum/orbit trading mechanism with the international space legislation.

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1.1. Spectrum/Orbit Resource – It Takes Two to Tango

Orbital position and radio spectrum are natural resources, which are both necessary for a satellite system to work. The orbital position offers a parking lot for the satellite, whereas the radio frequency spectrum makes the communication with the earth possible.

Most commercial communications satellites operate in the Geostationary Orbit (GSO), which provides them with the advantage to revolve at the same rate as the Earth in an eastward direction. Hence, the satellite appears to be stationary from earth and can communicate with approximately one third of the planet.¹ Therefore, the GSO is particularly valuable. Unlike other natural resources like petroleum, the radio spectrum and the GEO are not depletable. They are always available, except for that part that is being used.² However, given the increasing commercialization of space activities, the spectrum/orbit resource is becoming saturated.

The electromagnetic spectrum has the interrelated physical dimensions of space, time, and frequency.³ Thus, if two or more satellites communicate in the same frequency, at the same time and at the same place, harmful interference will be caused. Therefore, the restrictive factor on the number of satellites in the geostationary orbit is not only physical space; rather, it is an issue of electromagnetic interference between satellites using the same frequency band.⁴ As a result, the spectrum/orbit resource is the product of two “limited” resources that interact and depend on each other in order to provide space communication services.⁵

1.2. Spectrum/Orbit Trading Mechanism

Spectrum/orbit trading is a secondary mechanism, by which all or part of the primary assignment may be traded.⁶ Essentially, this means that market forces take the lead in determining how spectrum/orbit resources should be managed. Public administrations have an incentive to allow spectrum trading,⁷ as they consider it to contribute to a more economical and efficient

1 Christian A. Herter, JR, *The Electromagnetic Spectrum: A Critical Natural Resource*, 1985, Vol. 25 at p. 656, see also, Adrian Kopiz, *Scarcity in Space: The International Regulation of Satellites*, 2002, Vol 10 *CommLaw Conspectus* at 207.

2 Herter, *supra* note 1, at 653.

3 *Ibid*, at 655.

4 *Ibid*, at 657.

5 *Ibid*, at 657.

6 Spectrum trading: increasing the efficiency of spectrum usage, available at: <file:///C:/Users/Casual/Downloads/2227_file_Spectrum_trading_increasing_the_efficiency_of_spectrum_usag.pdf> [all websites last visited on 7 Sep 2016].

7 For EU Member States see section 2.2 below. For more information on United States, see Robert B. Kelly and Ann J. LaFrance, *Spectrum Trading in the EU and the US – Shifting Ends and Means*, available at: <<http://www.squirepattonboggs.com/~media/files/insights/publications/2011/10/spectrum-trading-in-the-eu-and-the-us-->

use of frequencies. However, there is a greater reluctance to adopt trading of the spectrum/orbit resource given the “res communis” nature of outer space.

2. Regulatory Framework

2.1. Regulation on International Level – ITU

Due to the extra-terrestrial and extra-territorial nature of satellite networks, the regulation of the spectrum/orbit resource has to be coordinated on an international level, to ensure rational and efficient use of the resource and to avoid harmful interference. This coordination role lies with the International Telecommunications Union (ITU).

The ITU is a United Nations specialized Agency⁸ which, inter alia, designates bands of the radio frequency spectra for certain services worldwide and oversees access to the orbital arc.⁹ As per ITU Constitution, the ITU shall “effect allocation of bands of the radiofrequency spectrum, the allotment of radio frequencies and the registration of radio frequency assignments and, for space services of any associated orbital position in the geostationary satellite orbit or of any associated characteristics of satellites in other orbits, in order to avoid harmful interference between radio stations of different countries”.¹⁰ Access to the spectrum/orbit resource is regulated through a two-track approach contained in the Radio Regulations.¹¹ These two separate processes

shifting-_/files/tel12_squire-sanders_ver4/fileattachment/tel12_squire-sanders_ver4.pdf>.

- 8 ITU is governed by the ITU Constitution which it is supplemented by the ITU Convention and Administrative Regulations (of which Radio Regulations are a part). Together these instruments form an international treaty to which ITU Member States are bound. ITU’s governing body is the Plenipotentiary Conference which meets every four years to adopt or amend the Constitution and the Convention as well as to elect officers and set the budget. ITU’s Radiocommunication Sector is supervised by the World Radiocommunication Conferences which meet every 3-4 years to adopt or amend the International Radio Regulations, a highly technical treaty which governs access to radio frequency spectrum and associated orbital resources. See Allison, Audrey L, *The ITU and Managing Satellite Orbital and Spectrum Resources in the 21st Century*, Springer Briefs in Space Development, 2014, at 10.
- 9 The two main areas of ITU regulatory involvement in relation to satellites are: a) frequency allocations (Article 5 of the Radio Regulations); and b) the coordination, notification and recording in the Master Register (Articles 9 and 11 of the Radio Regulations).
- 10 Article 1 para 2 subpara (b) of the Constitution). Moreover, the Constitution states in art. 12.1.1 (78), that the purpose of the Radiocommunication Sector of the ITU is to ensure “the rational, equitable, efficient and economical use of the radio frequency spectrum by all radiocommunication services, including those using the geostationary orbit, and to carry out studies without limit of frequency range”.
- 11 See supra note 9. The latest edition is Radio Regulations 2016. However, they are not yet available online. For Radio Regulations 2012, see <http://www.itu.int/dms_pub/itu-s/oth/02/02/S02020000244501PDFE.PDF>.

are referred to as unplanned bands, which work on a “first come – first served basis”,¹² and planned bands (or a priori).¹³ Under the “first-come, first-served process”, any national administration that proposes to use the spectrum receives the usage right after the completion of the registration procedure.¹⁴ The registration procedure comprises of three different steps.

The first step is the electronic submission of the Advance Publication of Information¹⁵ (API) to the ITU’s Radiocommunications Bureau. This informs all administrations of the intended satellite system, giving them the opportunity to assess whether it is likely to have an adverse effect in their existing or planned satellite systems and their terrestrial stations. The API shall be filed no earlier than 7 years and preferably no later than two years before the intended date for bringing into use the satellite system.¹⁶ This information is electronically published in the Bureau’s International Frequency Information Circular (BR IFIC). In case the administration fails to “bring into use” the satellite system within the 7 year timeframe, then the filing is subject to cancellation by the Bureau.¹⁷

The second step of the process is the so-called Coordination.¹⁸ Within two years of the Bureau’s receipt of the API, the notifying administration must submit a Coordination Request (CR), a document with the complete technical data for the network.¹⁹ The date that the Bureau receives the CR, establishes the system’s priority over later filings. After, the Bureau has electronically published the data, the administration seeking the use of the spectrum/orbit resource shall coordinate with the ones whose existing or planned system may be affected. Failure to send the CR within the two-year period also results in the cancellation of the filing.²⁰ The final step is Notification,²¹ whereby the satellite system is notified and registered in the Master International Frequency Register (MIFR).

In the case of “planned” frequency bands, each Member State has been assigned its own orbital position, bandwidth and operational parameter. This means that all nations have a guaranteed future access to this finite resource.

12 Detailed in Articles 9, 11 and in Volume I of the Radio Regulations, see Audrey L. Allison, *supra* note 9, at 17.

13 Contained in Appendices 30, 30A and 30B in Volume II of the Radio Regulations.

14 Christian Koenig and Martin Busch, Regulation In Outer Space, The Assignment of Rights to Orbit Positions and Frequency Usage By Telecommunications Satellites, ENLR, Volume 1 (2013), at 40, available at <<https://www.zei.uni-bonn.de/dateien/aufsätze-und-fallbearbeitungen/402.pdf>>.

15 Article 9, Section I, Radio Regulations.

16 Allison, Audrey L, *supra* note 8 at 20, (ITU Radio Regulation 2012, No. 9.1).

17 *Ibid.*

18 Article 9, Section II, Radio Regulations.

19 As required by Appendix 4 of the Radio Regulations.

20 Allison, Audrey L, *supra* note 8 at 20.

21 Article 11, Section I, Radio Regulations.

These “Allotment Plans” were initiated as a response to the concerns of the developing countries for equitable access to the scarce spectrum/orbit resource.

Both procedures establish an international recognition of the use of the spectrum/orbit resource by an ITU Member State. In essence, ITU acts as the facilitator²² and assures that the “use” undertaken by one State is recognized by all others and protected from harmful interference. It should be highlighted that ITU only interacts with national administrations.²³ Thus, the national administrations are entrusted with the power to assign the resource to commercial entities. Article 44 of the ITU Constitution sets out the fundamental principles that Member States shall have into mind when assigning the spectrum/orbit resource, namely, efficient use and equitable access:

“In using frequency bands for radio services, Members States shall bear in mind that radio frequencies and any associated orbits, including the geostationary-satellite orbit, are limited natural resources and that they must be used rationally, efficiently and economically, in conformity with the provisions of the Radio Regulations, so that countries or groups of countries may have equitable access to those orbits and frequencies, taking into account the special needs of the developing countries and the geographical situation of particular countries”.

2.2. Regulation at European Level

At European level, the European Conference of Postal and Telecommunications Administrations (CEPT) is entrusted with the task of technical harmonization and standardization of frequency usage. The Electronic Communications Committee (ECC) is CEPT’s expert group that aims to “harmonize the efficient use of radio spectrum, satellite orbits and numbering across Europe”.²⁴

The European Union (EU) is gaining an increasing role in the field of spectrum regulation. Although spectrum management remains within national competence, the EU sets policy goals for member states to achieve when allocating radio spectrum. In 2002, the so-called Radio Spectrum

22 According to Preamble O.6 of the Radio Regulations, ITU shall “facilitate equitable access to and rational use of the natural resources of the radio-frequency spectrum and the geostationary-satellite orbit”.

23 ITU “allocates” frequency bands to one or more services. It then “allots” frequencies to a particular region or group of states. The “assignment” of the frequency band to a private entity is the sovereign right of the ITU Member State. Francis Lyall and Paul B. Larsen, *Space Law, A Treatise*, 2009, at 231-232. See also Koenig and Busch, *supra* note 15, at 41.

24 <http://www.cept.org/files/1047/CEPT%20Leaflet_Nov2015.pdf>.

Decision²⁵ set the grounds for the policy and legal framework on radio spectrum of the (at that time) European Community. The Radio Spectrum Decision's objective is to ensure coordination of radio spectrum policy approaches by facilitating harmonized conditions for the availability and efficient use of spectrum. The Radio Spectrum Decision established the Radio Spectrum Committee, to support the Commission with the more technical implementation measures of its decisions. Additionally, the Radio Spectrum Policy Group²⁶ was created with a mandate to advise the Commission on broad policy issues. The Commission also mandates CEPT to carry out detailed technical work for its harmonization decisions.

The European Framework Directive 2002/21/EC²⁷ and the Authorization Directive 2002/20/EC,²⁸ as amended by Directive 2009/140/EC,²⁹ deal with the harmonization and management of the allocation and assignment of radio frequencies. Directive 2009/140/EC provided for further flexibility in the access to spectrum and spectrum management, to ensure the efficient use of spectrum.³⁰ In particular, Article 9b of the amended Framework Directive obliges Member States to ensure that undertakings may transfer or lease to other undertakings individual rights to use radio frequencies. In accordance with Article 8 (6) of the RSPP Decision³¹ adopted in 2012, Member States

25 Decision No 676/2002/EC of the European Parliament and of the Council of 7 March 2002 on a regulatory framework for radio spectrum policy in the European Community, Official Journal L 108, 24/04/2002, P. 0001 – 0006.

26 Created with a separate Decision namely Commission Decision 2002/622/EC. For more info on RSPG see <<http://rspg-spectrum.eu/about-rspg/>>.

27 Directive 2002/21/EC of the European Parliament and of the Council of 7 March 2002 on a common regulatory framework for electronic communications networks and services, OJ 2002 L.108/33.

28 Directive 2002/21/EC of the European Parliament and of the Council of 7 March 2002 on the authorisation of electronic communications networks and services, OJ 2002 L.108/33.

29 Directive 2009/140/EC of the European Parliament and of the Council of 25 November 2009 amending Directives 2002/21/EC on a common regulatory framework for electronic communications networks and services, 2002/19/EC on access to, and interconnection of, electronic communications networks and associated facilities, and 2002/20/EC on the authorisation of electronic communications networks and service OJ 2009 L. 337/37.

30 Recital 19 of Direction 2002/21/EC as amended by Directive 2009/140/ EC reads as follows: “[...] It is important that the allocation and assignment of radio frequencies is managed as efficiently as possible. Transfer of radio frequencies can be an effective means of increasing efficient use of spectrum, as long as there are sufficient safeguards in place to protect the public interest, in particular the need to ensure transparency and regulatory supervision of such transfers”.

31 Decision 243/2012/EU of the European Parliament and of the Council of 14 March 2012, establishing a multiannual radio spectrum policy programme.

shall allow the transfer or leasing of rights of use of spectrum in the harmonized bands.³²

2.3. Regulation at National Level – the Cyprus Case

In accordance with ITU procedures, orbital position and frequency usage rights are allotted to ITU Member States and not to private entities. Satellite operators need to follow the national licensing procedure and obtain the usage rights from the national administration.³³ An assignment in an unplanned band³⁴ results from an application by an operator for an assignment in a given band, with a specified coverage and a particular orbital position.

2.3.1. Regulatory Assignment Procedure

The competent authority for regulating the spectrum/orbit resource in Cyprus is the Department of Electronic Communications (DEC) of the Ministry of Transport, Communications and Works. DEC's activities are governed by the Radiocommunications Law,³⁵ the overarching national legislation for radiocommunications, and the relevant secondary legislation. The Radiocommunications Law and its subsidiary legislation implement the ITU and the EU legal framework.

According to Cyprus law, an authorization for an individual right of use of orbital/spectrum resources is granted through a negotiation procedure. As per Article 7A(2) of the of the Radiocommunication (Competition and Negotiation) Regulations,³⁶ the company interested for the spectrum/orbit resource has to be firstly evaluated from the Minister as prima facie suitable to be granted the individual right of use. To determine whether the company is prima facie suitable, the operator submits information regarding, inter alia, the company's experience and expertise, a schedule for implementing the project and the method of financing the project. The next step is the evaluation of the company's application from the Director of the DEC, in order to be determined whether the company is indeed suitable to be granted the individual right of use. This evaluation is based on more detailed criteria, such as the business plan of the applicant, key milestones etc. Provided that the company is

32 790-862 MHz, 880-915 MHz, 925-960 MHz, 1 710-1 785 MHz, 1 805-1 880 MHz, 1 900-1 980 MHz, 2 010-2 025 MHz, 2 110-2 170 MHz, 2,5-2,69 GHz, and 3,4-3,8 GHz". In other bands, Member States may also make provisions for undertakings to transfer or lease the rights to use frequencies in accordance with national procedures. See Article 9b of the Directive 2009/140/EC.

33 Koenig and Busch, *supra* note 14, at 41.

34 This is the procedure used for the majority of satellite networks.

35 The Radiocommunications Law of 2002, L. 146(I)/2002, 26.7.2002, as subsequently amended.

36 The Radiocommunications (Competition and Negotiation Procedures) Regulations of 2002, P.I. 382/2002, 9.8.2002, as subsequently amended.

found suitable to be granted the individual right of use, the Director of the DEC and the company will negotiate the terms of the authorization. Then, the DEC initiates the ITU registration process. The satellite provider has to provide the necessary information for the three-step procedure of the registration process. When a filing to MIFR in favour of Cyprus is made, and thus international recognition is established, the DEC assigns spectrum and the associated orbital position to the applicant by granting the authorisation. This authorization sets out the obligations on behalf of the satellite operator, the technical parameters regarding the satellite systems, the fees to be paid etc.

2.3.2. Spectrum Trading

The management of the usage rights registered in the ITU's MIFR is the exclusive prerogative of the pertinent ITU Member State. Consequently, a potential transfer of these rights can only be made in accordance with the respective national law. An ITU Member State shall always be involved in the process of transferring the rights from the assignment holder to a third party. Article 16A of the Radiocommunications Law, implementing the abovementioned provisions of Directive 2009/140/EU, enables the Director of the DEC to determine the framework, according to which authorized entities will be able to transfer or lease their individual rights of use of radio frequencies. It is important to note that article 16A entrusts the Director with ensuring that competition is not distorted as a result of any transfer or accumulation of rights of use of radio frequencies.

By virtue of Article 16A, the Radiocommunications (Trading of Individual Right of Use) Order was adopted in 2013. This Order specifies the procedures by which individual rights of use for the spectrum/orbit resource may be traded.

According to the Order, a resource can be traded permanently (transfer) or temporarily (leasing). If the trading pertains to the transfer of all or part of the individual right of use, the Director issues a new individual right of use to the beneficiary, setting out the conditions, restrictions, requirements and obligations. The Director also amends the individual right of use of the initially authorized operator accordingly. The validity period of the new individual right of use is the remainder of the duration of the initial individual right of use. If the trading relates to the lease of all or part of the individual right of use, the Director does not issue a new individual right of use to the beneficiary, but amends the existing right of the authorized operator accordingly. The duration of the lease may not be greater than the validity period of the individual right of use. Up to present, Cyprus has only approved one case of temporary transfer of use.

In both cases, the Director, before approving the trade, has to evaluate information by the third party, based on criteria similar to the ones that have to be provided by an applicant on a primary basis.

3. Does Spectrum/Orbit Trading Violate International Space Law?

It is evident, that the spectrum/orbit use is governed by an extensive international legal framework, under the aegis of the United Nations, made up of treaties and conventions governed by international law and implemented into national law. This section will examine whether spectrum/orbit trading contradicts international space law, namely the ITU legal framework and the Outer Space Treaty.

3.1. ITU Framework

As it was already mentioned, all ITU procedures in relation to the spectrum/orbit use, and the regional and national legislation developed to implement those procedures must reflect the principles of efficient use and equitable access. However, neither the ITU nor the EU have the competence to intervene in the national assignment procedures. This has worked both as a blessing and a curse, for it enables different interpretations and affords tremendous flexibility, which can either be beneficial or not, depending on one's interests.

This flexibility has also given rise to the growing phenomenon of "paper satellites", whereby administrations file satellite networks to blog certain spectrum/orbit resource, with no genuine intention for actual future use. This is a particular bad practice that leads to a backlog, as many filings remain for many years just on paper, obstructing the use of the resource by an operational satellite. However, this practice is not expressly prohibited by the ITU. One might suggest that in the absence of clear rules to prohibit such practice, the filing of "paper satellite" networks is allowed.

In this regard, the famous case of Tonga has caused great debate among the different ITU fora. Tonga, a small Pacific island, filed for 16 GSO allotments with the ITU. This angered the international community, as it was believed that it lacked a genuine need for so many GSO orbital positions. It was a fact, however, that Tonga did not break any ITU Regulations. At the end, Tonga withdrew its request for 16 satellites and in 1991 acquired six allotments. International community's discontent was aggravated, when Tonga leased one allotment to Unicom, a Colorado company and actioned off the other five allotments for two million dollars per year per orbit.³⁷

Similarly, ITU documents do not address the issue of spectrum/orbit trading, leading to the conclusion that this practice does not violate the letter of ITU. As a matter of fact, during the World Radiocommunication Conference 201243 (WRC-2012), it was recognized that "an administration can bring into use, or continue the use of, frequency assignments for one of its satellite networks by using a space station which is under the responsibility of another administration or intergovernmental organization". By analogy, this might

³⁷ Kopiz, supra note 2, at 208.

lead to the conclusion that by allowing the operation of a satellite that is owned by someone else in one's "own" orbital position, ITU admits also the possibility of the opposite situation, whereby one's "own" satellite uses someone else's orbital position.³⁸

Therefore, the question that arises is whether spectrum/orbit trading violates the spirit of ITU and the principles of equitable access and efficiency. There is no definite answer to this and has to be assessed by the administration, on a case by case basis.

As regards the principle of efficiency, the burden is on the national administration to perform due diligence on the operator seeking to either file a satellite network or to transfer/lease its existing one to a third party. The administration shall be able to assess if the operator has the resources and the plan to actually bring into use the spectrum/orbit resource. In fact, spectrum/orbit trading can contribute to the efficient use of the resource, as it can be used by operators that value them the most. For example, paper satellites can be traded and be used by companies that have the capacity but not the resource. In that way, the new company will be able to avoid the time-consuming and bureaucratic ITU procedures.

Likewise, spectrum/orbit trading can significantly contribute to the equitable access principle. More users, which are neither big space players, nor from a space-faring nation can have access to the spectrum/orbit resource on a "secondary basis". Therefore, allowing trading can make it easier for new players to enter the market and for space technology to develop.

However, the administrations must assure that no irrational exploitation of this mechanism is undertaken by the companies involved.

3.2. Outer Space Treaty – Non-Appropriation Rule

The next legal question is whether spectrum/orbit trading violates the non-appropriation principle of the Outer Space Treaty (OST).³⁹ Article II of the OST states that "outer space, including the moon and other celestial bodies, is not subject to national appropriation by claim of sovereignty, by means of use or occupation, or by any other means". The non-appropriation rule is the fundamental principle that governs space activities from the beginning of the space age. It considers outer space as *res communis omnium*, i.e. as an area free for exploration and use by all States which is not subject to national

38 Elina Morozova, Legal Regulation of Radio Frequency Spectrum, IAC-15-E7.4.11, 66th International Astronautical Congress, Jerusalem, Israel, 2015, 12 – 16 October, at 4.

39 Treaty on Principles Governing the Activities of States in the Exploration and Use of Outer Space, Including the Moon and Other Celestial Bodies, opened for signature January 27, 1967, in force since 10 October 1967 18 U.S.T. 2410, T.I.A.S. No. 637, 610 U.N.T.S. 205.

appropriation.⁴⁰ This has safeguarded outer space freedom from sovereignty claims and international conflicts.

At the same time, Art. I OST provides, inter alia, that “outer space, including the Moon and other celestial bodies, shall be free for exploration and use by all States without discrimination of any kind, on a basis of equality and in accordance with international law, and there shall be free access to all areas of celestial bodies”.

Therefore, OST allows the “use” of outer space, but prohibits the “appropriation by use”. Given the growing commercialization of outer space, it is becoming more difficult to assess whether an activity can constitute appropriation or not. The main principle is that no action, whether this is undertaken by a State or a private legal or natural person, can ever give rise to a right of ownership over any part of outer space, including the moon and other celestial bodies.⁴¹ A unilateral action to place the spectrum/orbit resource under one’s sole control and possession, without any limitations, can amount to appropriation.

However, ITU procedures, as detailed in the Radio Regulations, allow all States equitably to use (not to appropriate) this international finite resource.⁴² It concerns ‘a right of use’ which does not grant any permanent priority to any individual country or group of countries. It is subject to limitations imposed by ITU legal framework, e.g. limited period of validity, use-it-or-lose-it principle, etc.

Some authors suggest that spectrum/orbit trading violates the non-appropriation rule, without however providing further argumentation.⁴³ It is difficult to comprehend the reason why the primary assignment of the resource does not confer ownership rights, while accessing the resource on a secondary basis does. During the period that the right of use applies, the notifying administration is still the holder of the specific spectrum/orbit resource, including all the rights, obligations and liability that stem out of it,

40 Fabio Tronchetti, The non-appropriation principle under attack: Using Article II of the Outer Space Treaty in its defence, IAC-07-E6.5.13, 58th International Astronautical Congress, Hyderabad, India, 2007, 24 – 28 September, at 2.

41 Steven Freeland & Ram Jakhu, Cologne Commentary, in Stephan Hobe et al., eds, Cologne Commentary on Space Law (Cologne: Heymanns, 2009) vol 1, Article II OST, p. 53.

42 *Ibid*, at 61.

43 See e.g. Jannat C. Thompson, Space For Rent: The International Telecommunications Union, Space Law, and Orbit/Spectrum Leasing, 62 J. Air L. & Com. 279 1996-1997, at 309 in which it is suggested that the spectrum/orbit trading violates the OST at least in spirit as it creates property rights over the resource; Lyall & Larsen, supra note 24, at 243 in which it is argued that to auction space frequencies with accompanying satellite orbits would amount to appropriation of space. However it is recognised by the authors that it may be the way forward for the future; see also, Kopiz, supra note 2, at 222.

irrespective the exact manner and by whom the resource is being used.⁴⁴ The entity that accesses the resource on a secondary basis has to use it respecting all the restrictions and limitations imposed by the ITU and the national administration. This use cannot amount to appropriation, as it does not confer ownership on the resource. Indeed, it can be considered as a commercial use of the resource. Yet, to commercially and economically exploit the resource does not amount to appropriation.

In reality, the majority of space activities involve commercial use and sometimes some form of ownership. A launching party owns anything that it launches into outer space (see Art. VIII OST). There are property rights attached to this objects and the owner(s) can be held liable for damage caused by these objects.⁴⁵

It is the author's opinion that to trade the right of use of the spectrum/orbit resource does not violate the non-appropriation rule, in principle. However, national administrations must ensure that abusive practice is discouraged.

3.3. The Role of National Administrations

The role of national administrations in safeguarding the respect of the relevant international law cannot be overvalued. This is because the administration has the final say in the process of assigning the resource. The regulatory framework that governs the access to the spectrum/orbit resource intends to ensure the continuity of the legal link between the private entities and the administration, which is a key in safeguarding that international obligations are met.

Also, in the process of trading of rights of use on a secondary market, the national administration must always be involved for two main reasons: firstly, due to the fact that the national administration is entrusted with the management of the usage rights registered in the MIFR of the ITU, and secondly to avoid possible misuse of the mechanism and distortion of competition.

According to Resolution 49 of the ITU Radio Regulations, national administrations shall submit due-diligence information of their satellite networks. The primary reason for requiring such information is to avoid the reservation of spectrum and orbital resources without actual use. Consequently, before registering a prospective network with the ITU Bureau, it is incumbent on an administration to be satisfied that there is a genuine intention and realistic likelihood that the operator will launch the satellite. It is also obligatory on an administration to monitor progress against pre-

44 See Morozova, *supra* note 39, at 3.

45 H.R. Hertzfeld, F. von der Dunk, *Bringing Space Law into the Commercial World: Property Rights without Sovereignty*, *Chicago Journal of International Law*, v. 6, no 1 (Summer 2005), p 82.

specified milestones for the deployment of the satellite network.⁴⁶ It has to be considered that the ITU validates this information only as to completeness (i.e. all the mandatory boxes are filled in). Hence, the burden lies with the administration.

In case of trading, the national administration should require the submission of this information by the third party. The national administration should be satisfied with the content of the management and the technical deliverables provided by the third party, before approving the transfer.

As it was already mentioned, administrations should authorize trading on a case-by-case basis. They should be sceptical to allow trading, if it seems that an entity intends to hoard the resource by acquiring orbital slots and spectrum greater than their foreseeable technical needs or for speculative reasons (so called “speculative hoarding”). This attitude is not within the spirit of the pertinent international law.

4. Conclusion

The spectrum/orbit resource is becoming scarcer as the demand for its use is constantly increasing. Can the spectrum/orbit trading mechanism constitute a solution to this problem? It is the author’s opinion that this practice does not violate international space law, in principle. However, careful regulatory actions are required in the framework of both international and national law, to avoid abuses of legal rights.

46 Ofcom, Procedures for the Management of Satellite Filings, 30 March 2016, at 14, available at: https://www.ofcom.org.uk/__data/assets/pdf_file/0027/63495/new_procedures.pdf.

