

# A Review Essay on Legal Mechanisms for Orbital Slot Allocation

Jung, Joon-Sik\* · Hwang, Ho-Won\*\*

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\* Ph. D. Candidate in Air and Space Law, Korea Aerospace University; mindthegap@naver.com  
\*\* Professor, School of Air Transport, Transportation Logistics and Air & Space Law, Korea Aerospace  
University; howonhwang@kau.ac.kr

## I. Introduction: Scarcity, the Reason for the Advent of Orbital 'Slot' Concept

The term 'slot' connotes a spatial area in the geostationary orbit (GSO), where an artificial satellite rather squeezes in between pre-occupiers than simply takes a place with ease. The term thus is self-explanatory for its finitude. Had the demands for the parking lots in the GSO been low, the orbital slots would have never been the target of authoritative allocation despite its nature as a limited natural resource. However, the securing of slots in the GSO has functioned as a determining factor in the sustainability of satellite communications on the ground of the operative efficiency which implicates formidable financial advantages as follows.

Firstly, antennas equipped with ground stations do not need to enduringly manoeuvre to face satellites orbiting in the GSO because the rotary angular speed of the Earth synchronises with the revolving angular speed of the satellites around the Earth. Only the GSO can provide that advantage. Unlike the GSO, if an orbital plane of a satellite is any tilted relative to the equatorial plane, the satellite will appear to go up and down repeatedly in the eye of the ground stations. If it is any elliptical, the satellite will be, from the viewpoint of the Earth stations, neither stationary nor moving at a constant speed. This phenomenon can be explained by the Kepler's second law: "A planet moves in a plane, and the radius vector from the sun [or the Earth] to the planet [or the satellite] sweeps out equal areas in equal times"<sup>1)</sup>

Secondly, the minimum required number of satellites to set up in the GSO a network providing complete coverage of the Earth is less than three<sup>2)</sup> whereas that of satellites operating on such less prestigious trajectories as Low Earth Orbit (LEO)<sup>3)</sup> or Medium

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1) MIT, "Open Course Ware: 18.02SC Multivariable Calculus", 2010.

2) Mark R. Chatrand, *Satellite Communication for Nonspecialist*, SPIE: Washington, USA, 2004, p.175.

3) Mark Nogueira, "The Benefits of Low-Earth Orbiting Satellite Technology for the International Community: Can the Potential be Realized?", Vol. 16, *India Journal of Global Legal Studies*, 1998, p. 739, note 1 and 4; LEO is referred by U. S. FCC to as any orbiting system that operates not in the GSO, but normally at an altitude of around 1,000km. The required number of

Earth Orbit (MEO)<sup>4)</sup> need much more to do the same job. Several advantages of the latter two orbits over the GEO should not be overlooked. The LEO and MEO systems cause less communicational delay as the distance at which it transmits or retransmits signal is much shorter in comparison to the GEO system.<sup>5)</sup> They allow use of smaller dishes annexed to smaller transmitters and re-use of frequency with amenable angle. Having considered the fact that the GEO system maintains '24 hours visibility' with a few satellites, they require, however, much more satellites to form a network providing such seamless coverage of the Earth.

Thirdly, the radius of the geostationary orbit around the Earth is the distance at which the centrifugal force of a satellite equals the gravitational force acting upon that satellite, which is about 30,000km above the Earth. The balance of the two counteracting forces means that any satellite in the GSO, in theory, hardly requires additional propulsion to keep the satellite from falling to the Earth. In contrast, satellites on the LEO and MEO have much shorter in-orbit lifetime due to not having such a favourable law of nature the GEO enjoys.

As aforementioned, the advantages over the other types of orbits in regard to the number of satellites that have to be deployed to organise a network for constant coverage, necessity of antenna manoeuvres, and the extra propulsion to maintain the orbital position vest the GEO system with enormous prestige that has brought the scarcity of geostationary orbital slots. From this geophysically derivated commercial standpoint, a thorough examination in regulatory mechanisms for the allocation of the orbital slots is a prerequisite to grasp the extent to which the realization of justice on distribution of common resources in outer space.<sup>6)</sup>

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satellites operating in the LEO ranges from 12 in the case of Odyssey to 66 for Iridium to provide global coverage.

4) International Telecommunication Union, "Regulation of global broadband satellite communication", April, 2012, p. 6.; "A medium earth orbit satellite (MEO) systems with its altitude ranging from 8 000 to 15 000 km above the Earth requires a larger number of spacecraft, typically a constellation of about 10 to 15 satellites to maintain constant coverage of the earth."

5) Ibid., p. 7.

6) The geostationary orbit has a radius of approximately 35,768km from the centre of the Earth. Thus, it is arguably located in outer space, which means the GSO is subject to the 1967 Outer Space Treaty although strategic efforts were made to imbue the GSO with *sui generis* status, i.e.

## II. Anatomy of Legal Mechanisms for Orbital Slot Allocation through the ITU

The International Telecommunication Union allocates orbital slots, *inter alia*, geostationary-satellite orbits.<sup>7)</sup> A step more precisely, its lower operating body, Radiocommunication Sector takes such duty in accordance with the Article 44 of the Convention of the ITU.<sup>8)</sup> The Article 44 states that the use of orbits must conform to the Radio Regulations.<sup>9)</sup> Consequently, the most subordinate but substantive legal instrument for the allocation of the orbital slots is the Radio Regulation (RR).

As the main of goal of the ITU is to obviate harmful interferences in radio communication, it is necessary to determine who should not interfere with whom or, in other words, who can claim protection against whom. The RR refers to such protection as ‘the right to international recognition’.<sup>10)</sup> The moment that an administration obtains the right is when an administration’s frequency assignment coupled with a corresponding orbital slot is entered into the Master International Frequency Register or in conformity with a predetermined allotment plan.

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“outer void space”, in an attempt to render the GSO immune to principles enshrined in the OST. The Article 1 of the Treaty stipulates two double-edged-sword-type principles: province of all mankind *v.* free exploration and use. However, the latter does not include misuse or abuse of outer space. The free exploration and use shall be committed for all including developing states. In addition, non-appropriation principle immediately follows the Article 1 as considering outer space *res extra commercium*, in which only free use without appropriation and, *ipso facto*, prejudice to others’ access to outer space is allowed, and distinguishing the notion from *res nullius* that can be appropriated by ‘first comers’; see Han-Taek Kim, “A Study on the Meaning of Outer Space Treaty in Outer Space”, Vol. 28, No. 2, *Korea Journal of Air and Space Law*, 2013, pp. 228-232; see also Bin Cheng, “Introducing a New Term to Space Law: ‘Outer Void Space’”, Vol. 11, *Korea Journal of Air and Space Law*, 1999, pp. 321-327; Therefore, the review of how rigidly the first-come-first-served rule has maintained in the allocation of orbital slots has vast implication as to the distributive justice.

7) Constitution of the International Telecommunication Union (ITU CS), Article 1, para. 2, a (§11); the drafter of the RR puts in the paragraph ITU’s function to allocate orbital position in the ‘geostationary-satellite orbit’ prior to that of other orbits. The main purpose of such allocative function of is the avoidance of ‘harmful interferences’ between radio stations of different states.

8) ITU CS, Article 12, para. 2 (§78).

9) *Ibid.*, Article 44, para 2 (§196); “Member states shall bear in mind ... that they [, radio frequencies and any associated orbits] must be used ... in conformity with the provisions of Radio Regulations ...”

10) ITU Radio Regulation (RR), Article 8.3.

## 1. A Posteriori System: ‘first come, first served’

The allocation of the bulk of frequency bands which are enumerated in the Table of Frequency Allocation embedded in the RR available for all non-military radiocommunication follows this system that favours the early birds. The Table<sup>11)</sup> merely comparts the frequency bands by types of services<sup>12)</sup> and regions<sup>13)</sup> to be abided by allocatees, which does not have a literal meaning of ‘allocation’ that assumes the existence of recipients to whom it allocates such natural resources, but only delineates what to be allocated for certain purposes in certain geographical areas. Therefore, in a *posteriori* system, any administration all over the world may freely assign frequencies and orbital slots in which they place their space stations upon only the conditions that their assignments accord to the compartmentalized purposes and regions in the Table. In this sense, reduced to the acquisition of the right to international recognition, it is critical for administrations to seek earlier than its contenders for an entry in the Master Register. The reference point to determine who comes first is the dates of receipt by the ITU of notices sent by right-seeking administrations.<sup>14)</sup>

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11) Section IV, Chapter 3, the RR Vol. I; it is the most lengthy part that takes up about a third of the Volume I of the RR and covers frequencies ranging from 8.3KHz to 275GHz.

12) Ibid.; the Table enumerates such types of services as radiocommunication in maritime, aeronautical, mobile, inter-satellite, navigational, broadcasting, space operation or research oriented, meteorological, astronomical, and explorational services. The types bifurcate between ‘primary services’ in majority, the names of which are written in capital letters and ‘secondary services’ which is always subordinate to the priority of primary services to claim protection from harmful interferences.

13) ITU RR Article 5.2; as a rough description, Region 1 refers to European and African continents including Russia and some countries in the Middle East. Region 2 and 3 corresponds to the Americas and the Asia Pacific respectively.

14) ITU RR Article 11.28; “Complete notices shall be marked by the [ITU Radiocommunication] Bureau with their date of receipt and shall be examined in the date order of their receipt [emphasis added]”. See also Article 11.2 and 11.8: ‘Any frequency assignment ... shall be notified to the Bureau ... if it is desired to obtain international recognition for that assignment.’”

## 2. Verification of Rigidity of the ‘first come, first served’ Principle

De Man identified the seven factors that ‘mitigate’ the rigidity of the ‘first come, first served’ rule<sup>15)</sup> and illustrated instances in which the applicability of such antecedence rule is not absolute or pre-emptive in nature and interacts with other important principles such as conformity with the RR and avoidance of harmful interferences.

### (1) The Fetish of Harmful Interference

The rule only applies to assignments capable of causing harmful interference.<sup>16)</sup> The idea the author conveyed is that even late-comers may freely use their frequency assignments coupled with orbital slots so long as the assignments are not capable of causing harmful interference, and the rule thereby becomes allegedly nullified. Juxtaposed herewith is a deciding *raison d’être* of the rule along with the RR: being a standard referred to setting priority over reciprocal harmful interferences. The inevitable manifestation of the harmful interferences, the removal of which against the will of interferers, i. e. the administrations of the next priorities, substantiates the exclusivity serving the formation of the *de facto* property rights,<sup>17)</sup> are presupposed

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15) Philip De Man, “Rights Over Areas Vs Resources in Outer Space: What’s The Use of Orbital Slots?”, Vol. 38, *Journal of Space Law*, 2012, pp. 81-88.

16) ITU RR Article 4.2, “Member States undertake that in assigning frequencies to stations which are capable of causing harmful interference to the services rendered by the stations of another country, such assignments are to be made in accordance with the Table of Frequency Allocations and other provisions of these Regulations”; the ‘other provisions’ here include the ‘first come, first served’ rule.”

17) The term ‘*de facto* property rights’ is used hereafter to display the nature of the rights given to slot bearers as being no worse than *de jure* property rights consisting of privileges to use, exclude, and trade. The right to exclusive possession of slots forms by virtue of the first-come-first-served rule of which the overriding applicability to establishment of the rights is to be verified in this and the following chapters. Transferability of orbital slots for monetary consideration is barely known to the public but prevalent amongst the non-governmental operators using satellites in radio-communication. Transactions of the slots in practice are well evidenced in the news articles as follows: Dylan Bushell-Embling, “NewSat secures rights to eighth orbital slot”, *Computerworld*, March 8 2012, accessed at June 15 2014 at [http://www.computerworld.com.au/article/417987/newsat\\_sec](http://www.computerworld.com.au/article/417987/newsat_sec)

in the proprietary context of this essay. The assertion is herewith irrelevant. Noteworthy is in addition that the achievement of complete electromagnetic compatibility appears far remote from current practices in radiocommunication.<sup>18)</sup> It implies that there exist no assignments capable of causing harmful interference but at the same time not susceptible to such interference caused by subsequent assignments. With regard to the securing of the orbital slot, the ‘first come, first served’ rule dictates, bar none.<sup>19)</sup>

## (2) The Rule of Conformity

The ITU CS elucidates the privilege of radio stations that operate in accordance with the RR. On one hand it imposes obligation not to cause harmful interference upon ‘all’ stations regardless of the date on which the stations put their assignments in the Master Register, and on the other hand grants the right to protection from such harmful interference to only those that conform to the RR.<sup>20)</sup> The author furthered the relative importance of the rule of conformity with the RR that could allegedly

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ures\_rights\_eighth\_orbital\_slot/; Neil Ungerleider, “Ahumanright.org aims to buy commercial satellite for the world poor”, Fast Company, December 28 2010, accessed June 15 2014 at <http://www.fastcompany.com/1712533/ahumanrightorg-aims-buy-commercial-satellite-worlds-poor>; Jeffrey McCracken and Cristina Alesci, “Telesat Said to Seek Buyers, Sale May Bring Up to \$7 Billion”, Bloomberg, November 20 2010, accessed June 15 2014 at <http://www.bloomberg.com/news/2010-11-19/telesat-may-look-for-buyers-in-deal-valuing-satellite-firm-at-up-to-7-billion.html>; see also James E. Dunstan, “Toward a Unified Theory of Space Property Rights: Sometimes the Best Way to Predict the Weather Is To Look Outside”, in *Space: The Free Market Frontier*, eds., Edward L. Hudgins, Cato Institute, Washington D. C., pp. 229-231, 2002.

18) Hong Zhao, et. al., “Research and Technology of Electromagnetic Compatibility Technology”, Vol. 7, No. 9, *Journal of Computers*, 2012, p. 2246; Najett Neji, et. al., “Electromagnetic compatibility: New trends for new standards”, IEEE International Conference on Communication, 2012, p. 2-3; The EMC technologies still remain at the level of spectrum ‘sharing’ and ‘mitigation’ of interference for which the frequency hopping, listen-before-talk, and Dynamic Frequency Selection were developed.

19) ITU RR, Vol. 2, Annex 2, Table 2, p. 69; the nominal geographical longitude on the geostationary-satellite orbit is designated as mandatory information to submit in advance publication, notification in both *a priori* and *a posteriori* allocation systems.

20) ITU CS Article 45; it reads “All stations, whatever their purpose, must be established and operated in such a manner as not to cause harmful interference to the radio services or communications of other Member States, or of recognized operating agencies, or of other duly authorized operating agencies which carry on a radio service, and which operate in accordance with the provisions of the Radio Regulations [emphasis added]”.

render the 'rule of antecedence' even 'moot' by interpreting the definition of the harmful interference within the ITU's legal instruments as that the harmful interference does not even legally 'exist' in a strict sense, although it exists physically, if it is caused to a station that does not operate in accordance with the RR.<sup>21)</sup> The practical implication of the second assertion is that even the late-comers to the Master Register can exercise their rights against the first-comers on the basis of non-conformity of the latter with the RR, which appears to vastly degrade the non-rivalry and absolute applicability of the 'first come, first served' rule to the allocation of orbital slots. However, whilst the factor aforementioned should once be taken into account to examine in theory which principle dominates or how relevant principles interplay with one another in the current allocative regime of the ITU, a question on how often the rule of conformity is actually considered when the ITU decides which administration for an orbital slot in question has priority over its contenders must accompany so as to see the real impact of the rule on the regime. For instance, what could there be an occasion serious enough for a Member State to infringe the RR thus to lose its priority in securing of orbital slots over its competitors? Is it possible in reality for those who once acquired international rights to such scarce resources through exhausting ITU procedures to operate not in accordance with the RR, knowing its non-conformity would result in painstaking loss of the right? An analogy between likelihood of losing administratively created right to airport slot and orbital slot may safely be drawn. As confirmed in practice, the 'use-it-or-lose-it' (a. k. a. '80/20' rule) can hardly be infringed unless air carriers advertently abandon those slots, especially in case that those are so-called 'junk slots'. If an air carrier held slots serving golden time in the sense of lucrativeness, it would almost impossible for us to expect the carrier to lose her right due to sheer non-fulfilment of using up 80 percent or more of the given time slots. Allowing for the fact that geostationary-satellite orbital

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21) ITU CS Annex §1003 and RR Article 1.169; the definitions in the two instruments are identical as those read 'Interference which endangers the functioning of a radionavigation service or of other safety services or seriously degrades, obstructs, or repeatedly interrupts a radiocommunication service operating in accordance with the Radio Regulations.'



positions are regarded highly in scarcity value when it comes to radiocommunication and thereby as the object which the ITU mainly allocates, the likelihood to lose the right to orbital slots simply on the score of non-conformity with the RR would be pretty slim to none in practice. As appeared to have agreed upon this notion, the author acknowledged, despite the alleged interoperability of the conformity rule as a principal norm in the allocative regime, the fact that such rule has too narrow scope to function as an inclusive principle<sup>22)</sup> and that the ‘first come, first served’ rule “re[e]merges as the most reliable and transparent means of settling priority disputes’ and as a ‘determining factor for the use of a slot when a late comer to the spectrum is faced with intransigent first user’.<sup>23)</sup> The overriding aspect of the antecedence rule arises from, at first sight, the non-centralistic but self-regulating nature of the international coordination phase, of which the initiation is a prerequisite to the notification procedure for an entry of an unplanned assignment in the Master Register<sup>24)</sup>, but which ends up with that the ‘first come, first served’ rule comes on the scene as a troubleshooter within the ITU regime. It also results from the functional limit of the Radiocommunication Bureau (ITU BR) in regard to dispute settlement upon harmful interference. In the light of the importance underlying the acquired immunity to interference that forms core part of the international rights, the dispute settlement over the harmful interference can be divided into two phases by timing difference: before and after the actual use of frequency assignments.

The coordination is in essence ‘bilateral and voluntary’<sup>25)</sup> consultation required at an early stage for conflicting States to go through before the use. If the concerned administrations reach, after the consultation,<sup>26)</sup> gridlock in which they conclude no

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22) David M. Leive, *International Telecommunications and International Law: The Regulation of the Radio Spectrum*, p. 21, Sijthoff, 1970, quoted in De Man, supra, p. 89.

23) De Man, supra, p. 88-90; the word ‘remerge’ may be a typo for ‘re-emerge’ since the ‘antecedence rule’ ultimately surfaces as a last resort to settle the disputes over harmful interference.

24) ITU RR Article 9.6; frequency assignments which an notifying administration must coordinate with relevant counterparts include, amongst others, those related to use of geostationary-satellite orbit, those required to initiate coordination or seek agreement with other administrations in the footnote of the Table of Frequency Allocations, and those operating in opposite direction of transmission.

25) De Man, supra. p. 90.

26) Through procedures for the coordination are enumerated in the ITU RR Article 9.

agreement upon the projected use of radio frequency and orbital slots attached thereto, the ITU BR preliminarily communicates to the parties a conclusion including its recommendations based on the information it mandatorily gathered from them,<sup>27)</sup> then, if the disagreement remains unsettled, undertakes to examine the notice submitted by the party that initiated the coordination, and lastly registers the notice in the Master Register upon ‘favourable’ findings on the review of the probability of harmful interference.<sup>28)</sup> That the concerned administrations enter into the coordination phase means the time they take the rule of conformity under consideration has already lapsed for the reason mentioned above. As an overwhelming feature of a legal principle enshrines in its finality which cannot be altered by the objects of such rule, the ‘first come, first served’ rule prevails as the conflicting parties arrive at the stage in which the examination on ‘the probability of harmful interference’ takes place if they fail to settle the disputes on the harmful interference through the fully autonomous procedure in which they may upon agreement rule out the antecedence rule.

After the use of frequency assignments, a different part of the RR from the provisions for the coordination procedure governs the conflicts over harmful interference.<sup>29)</sup> To sum up the procedure for dispute settlement on harmful interference in the Regulation, the procedure is advised to be reviewed in several respects the author of this article suggests: time frame before and after the determination of cause and characteristics of the harmful interference, actors defined in the procedure, and obligations directly and indirectly imposed upon the actors. The actors formally structured in the procedure are three administrations having jurisdiction respectively over ‘transmitting’, ‘receiving’ and ‘interfering’ stations. Again, to decide who interferes and who is being interfered largely hinges on who has preceding use of a frequency assignment and an associated orbital position where the interference arises. The wording adopted in the procedure implies that the procedure merely details how

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27) ITU RR Article 9.63.

28) Article 9.64 and 9.65.

29) ITU RR Article 15, Section VI: ‘Procedure in case of harmful interferences’ governs status quo post the assignment and subsequent use thereof.

to identify the existence of harmful interference and what steps need to be taken in sequence amongst ‘predetermined’ aggressors and victims.<sup>30)</sup> Therefore, the procedure governs the dispute in which there is no room for the rule of conformity to meddle in but the ‘first come, first served’ rule has already prevailed.

Putting aside the matter of priority setting or reciprocal exclusivity between the rule of conformity and that of antecedence, the dispute settlement procedure reviewed above favours so-called space-faring Member States for which the ‘first come, first served’ principle works favourably. This notion can be confirmed by, as suggested earlier, the obligations of the defined actors before and after the determination of cause and characteristics of harmful interference. This argument should proceed with the premise that the administrations having jurisdiction over ‘transmitting’ and ‘receiving’ stations are deemed the space-faring States, hereinbelow referred to as ‘the developed’ in this paragraph, whilst the others, the administrations whose jurisdiction is over ‘interfering’ stations, are deemed those, referred to as ‘the developing’, with poor resources for space activities in radio communications. Logical grounds for this premise lies on that in the ITU regime States that ‘interfere’ are later comers, the status of which may sometimes be of the space-faring States in conflict with another developed players but mostly of the developing in broad view of the argument over the *de facto* private property rights established in the air and space laws that appear to lack ‘equity’, ostensibly reflected in those laws but actually abandoned by the mechanism that only favours who comes first to the natural resources with which late comers can legitimately share.<sup>31)</sup>

In the stage of the determination of cause and technical feature of harmful interference, pinpointing the source of harmful interference in question places in the top priority of the developed to use their privileged positions. To fulfil the prerequisite

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30) This interpretation is buttressed by the complementary descriptions of the actors as ‘the transmitting station whose service is being interfered’ and ‘the receiving station experiencing the interference’. See *ibid.*, Article 15.30, 15.31, 15.32, 15.33, 15.34, 15.36, 15.38, and 15.39.

31) Treaty on Principles Governing the Activities of States in the Exploration and Use of Outer Space, including the Moon and Other Celestial Bodies (Outer Space Treaty, OST), Article 1, 2 and 9; ITU CS Article 44, 2 (§196).

purpose, legal obligations are distributed to all actors involved. As a common denominator, all the actors have the duty to endeavour to settle the dispute over harmful interference in the form of cooperation and mutual assistance in furnishing all the information available and technical solutions.<sup>32)</sup> The cooperation, in the detection of an epicentre, between the developed, the administrations having jurisdiction over transmitting and receiving stations, must be completed as soon as possible.<sup>33)</sup> Even before the concrete determination of particular interfering stations, the ‘suspects’ are legally burdened to submit the latest locational information<sup>34)</sup> of their space stations when requested by the developed. Having determined specific stations causing the harmful interference, one of the developed, the genuine space-faring administration whose jurisdiction is over the ‘transmitting’ station, must communicate the interference to whom still remains as a ‘suspect’ whose jurisdiction is believed to cover the ‘offender’ station.<sup>35)</sup> The suspect has the obligation to acknowledge such complaint.<sup>36)</sup> Contrary to the compulsory nature of the determination of source of the harmful interference and the party-and-party settlement out of the regulatory body, there is in the procedure no embedded provision that enforces the developing to eliminate the harmful interference but only two ‘voluntary’ steps to facilitate the elimination in case that the dispute remains unsettled: sending a report to the interfering administration as a preliminary measure, and forwarding the case to the BR as a last resort. Where the latter is the case, all the legal duties of the BR to address the disputes are rather ‘facilitative’ than authoritative as it is bound only to ‘help’, ‘seek’, ‘prepare’ and ‘conduct’ in the pursuit of the identification of the source of the harmful interference and trespassers of the RR, and as the last

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32) ITU RR Article 15.22-15.27; the only explicit duty imposed on the actors is to cooperate in determination and elimination of harmful interference. However, diplomatic wordings such as ‘utmost goodwill’ and ‘due consideration’, and such provisions obscuring obligors as ‘it is essential’ and ‘full particulars shall be given’ were employed to underpin the general purpose of the procedure with flexibility spared for the complicated nature of the dispute settlement.

33) *Ibid.*, Article 15.29-15.32.

34) “current ephemeral data necessary to allow determination of the positions of the space stations when not otherwise known”, *Ibid.*, Article 15.33.

35) Article 15.34.

36) Article 15.35.

the issuance of a report to the Radio Regulation Board, of which the nature of the main function is advisory.<sup>37)</sup> In the view of the implied premise that the dispute settlement procedure after the use of frequency assignment is based upon the ‘first come, first served’ principle from its initiation, the procedure merely delineates procedural steps about how the developed determines the ‘liable’ administration for harmful interference in question as quickly as all the involved States can, brings the administration into an autonomous arena of dispute settlement at first and later seeks internationally official confirmation of who has interfered whom.

Having reviewed the coordination procedure as a means prepared for the dispute settlement over harmful interference before the use of frequency assignment, and the general procedure as a means for the same purpose after such use, the rule of conformity with RR is overwhelmed in practice by the ‘first come, first served’ rule which generally favours the space-faring States, and is following the autonomous party-and-party procedure in which the principle of private autonomy, fisticuff law in other words, is likely to outweigh the pursuit of equality of which the principle is enshrined in the ITU CS.

### (3) Registrations Immune to the Rule

De Man called attention to that the fact that non-conforming radio frequencies can even be registered in the Master Register on certain conditions supports the interoperability between the rule of conformity and the ‘first come, first served’ rule. In the notification procedure, if an assignment under examination by the BR does not conform to the Table of Frequency Allocations and Rules of Procedure thereby forming ‘unfavourable’ findings, it may nevertheless be registered for ‘information purposes’ which means that the notifying administration is neither allowed to cause harmful interference to any other stations operating in accordance with the all the ITU instruments, nor privileged to claim protection.<sup>38)</sup> The other conditional

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<sup>37)</sup> Article 13.1-13.3.

<sup>38)</sup> ITU RR Article 11.31, 11.36, and 4.4.

registration the author referred to is the 'provisional' entry into the Master Register when the notifying administration fails in an assessment on the probability of causing harmful interference.<sup>39)</sup> However, the relevant article does not mention the literal word indicating 'provisional registration' which as a matter of fact refers to the case in which an assignment may be 'registered provisionally in the Master Register' if the notice of such assignment does not conform to 'planned' allotment of frequencies.<sup>40)</sup> In the case of the 'provisional' registration the author suggested, the BR has to put the assignment into the Master Register 'with an indication of those administrations whose assignments were the basis of unfavourable finding [emphasis added]'. Both of the two irregular registrations are obviously tagged with 'unfavourable finding' and not entitled to the 'right to international recognition' on their assignments since the RR explicitly stipulates that only the entry into the Master Register with 'favourable finding' has such right.<sup>41)</sup> Therefore, the exceptional registration is irrelevant to the supportive idea of the interoperability of the two principles in terms of the actual exclusive effects thereof.

#### (4) The Hierarchy of Services

The author introduced another factor in determination of priorities about harmful interference: the hierarchy of services, other than the type of service. In the Table of Frequency Allocations, the 'primary' services written in 'capitals' have absolute priority over the 'secondary' services that are printed in 'normal characters'.<sup>42)</sup> In priority conflict between the two, the antecedence of entry into the Master Register has no bearing. However, in such conflict within each service, the first comer still has definite advantage. The race for gold medals in a variety of events is still ongoing. If a slow runner won the race over his fore counterparts on the same track in the

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39) De Man, *supra*, p.84; ITU RR Article 11.32A, 11.33, 11.38 and 11.41.

40) ITU RR Article 11.39E; this is applied to the allotment Plan for coast radiotelephone stations in the exclusive maritime bands between 4,000KHz and 27,500KHz; see Appendix 25, Vol. II, ITU RR.

41) Article 8.3.

42) Article 5.24-5.26.

same event, the author's concern over the degradation of the 'first come, first awarded' rule would justify itself. However, the track or event differs from one another or even the difference amounts to the distinction between the Olympics and Paralympics.<sup>43)</sup> It is merely a two-tier system which does not disturb the argument over whether the prevailing 'first come, first served' principle could be significantly affected.

### (5) The Procedural Measure against the Predominance of the Rule

There is a seemingly explicit provision that debilitates the 'first come, first served' principle in the Rules of Procedure.<sup>44)</sup> The Rule H40 stipulates that 'no administration enjoys any particular priority as a result of being the first to either the advance publication procedure or to request coordination'. However, the author admits that the Rule ironically reaffirms the unfading nature of the 'first come, first served' principle for it omits the 'notification' procedure that consummates the status of being 'served'. It is stated that the 'ITU Radio [Regulation] Board has explained in its rules of procedure in applying Article 9 [Procedure for effecting coordination with or obtaining agreements of other administrations]'<sup>45)</sup> the Rule H40. Having solely considered the preceding statement of the Board, the application of the Rule H40 is limited to the advance publication and coordination phases thereby it seems that the omission of the notification procedure was not a legislative blunder otherwise the intent of the ITU would have clearly looked as "[to] mitigate the impact of the

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43) See footnotes of the Table of Frequency Allocation embedded in Article 5, ITU RR; the types of services allocated on the secondary basis include mobile, fixed, radiolocation, space research, space operation service (Earth to space), radio astronomy, radio altimeters, land mobile service, earth exploration-satellite, radio determination, meteorological aids, weather radar, and amateur in particular. The secondary service covers no economically meaningful ones such as broadcasting, aeronautical mobile, aeronautical radio-navigation, mobile-satellite (space to Earth), and etc. Frequency bands used for military purposes, of course, are not included in the secondary services.

44) Joseph Wilson, "The International Telecommunication Union and the Geostationary Orbit: an Overview", Vol. 23, *Annals of Air and Space Law*, 1998, p. 241, 262-263, quoted in De Man, *supra*, p. 85.

45) Federal Communications Commission, "Second Order on Reconsideration", FCC-10-188A, footnote 26, November 2010, p. 5.

antecedence rule wholesale”.<sup>46)</sup> Contrary to this interim conclusion, it needs to be taken into account that the advance publication and coordination are prerequisite steps for a right-seeking State to advance to the notification phase. Consequently, the Rule H40 virtually applies to the notification phase, thus reinforcing the alleged linkage between the Rule H40 and the mitigation of the antecedence rule. For the aforesaid reasons, the implication of the Rule becomes equivocal and hinges on actual influence valuation of the Rule.

From the perspective of the impact, it should be noted that the only space-competent States are capable of initiating the advance publication upon which a variety of technical particulars, i.e., date of bringing the frequency assignment into use, location of the transmitting and receiving antennas, etc.,<sup>47)</sup> have to be furnished. In combination with this, it should also be taken into consideration that several States, mostly the developed,<sup>48)</sup> have registered the so-called ‘paper satellites’ since an early age of satellite communication. The ITU defines the practice of over-filing orbital slots as follows:<sup>49)</sup>

deliberate and routine ‘over-filing’ – in shorts, requests *for coordination* for orbital positions and frequencies that are not actually needed, with a view to ‘reserving’ those positions and frequencies for possible future use, or *for commercial resale to another user* at a later day [emphasis added]

In this perspective, the Rule H40 could have been devised to cope with the ‘paper satellite’ problem upon the request of displeased Member States, mainly the developing, but calculated to have dropped the notification procedure in it in order

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46) De Man, *supra*.

47) ITU RR, Vol. II, Appendix 4, Annex 1, Table 1; those items are designated as mandatory items to be included in the advance publication.

48) Ram Jakhu, “Legal Issues Relating to the Global Public Interest in Outer Space”, Vol. 32, No. 1, *Journal of Space Law*, 2006, p. 74.

49) ITU, “Paper Tigers: The Scramble for Space Spectrum”, a Feature Story prepared for Media Information at ITU Plenipotentiary Conference 2002. at [http://www.itu.int/newsarchive/pp02/media\\_information/feature\\_satellite.html](http://www.itu.int/newsarchive/pp02/media_information/feature_satellite.html); Jakhu described it as ‘not actual satellite in orbit but early registration with the ITU that blocks the placing of other satellites in the same location in the GEO’, see *ibid*.



to set up actual bringing the frequency assignment and associated orbit into use as the most critical standard for the entitlement of the international right. De Man thoroughly examined how the international right attached to the assignment of orbital slots in planned services, amongst others the broadcasting-satellite service (BSS), is actually acquired, and found that the date of receipt by the BR of assignment notice is ‘not’ decisive as to the entitlement by comparing provisions<sup>50)</sup> coded in the BSS plan. Based on this analysis and the application of the analogical reasoning, he shed light on the interpretation of the Rule H40 that “the date of receipt is less decisive in the general procedure for unplanned bands as well”<sup>51)</sup>, which is contrary to his preceding review of the Rule<sup>52)</sup> but consistent with the point he made to set forth the ‘actual’ and ‘continued’ use of the assigned frequencies and orbits as the most critical standard for acquiring the international right. In conclusion for the interpretation of the Rule H40 after the literal and impact assessment, the Rule was designed to serve the interests of the developed, which tipped the argument toward the retention of the ‘first come, first served’ rule.

## (6) The Technical Factors and Equity Norm

The author added two factors that allegedly work in determination of priority on the same footing with the antecedence rule: the relevant technical factors and coordination process.<sup>53)</sup> At first, the technical elements<sup>54)</sup> he referred to are, however,

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50) ITU RR, Vol. 2, Appendix 30, Article 5.2.2 and Article 5.1.8; the Article 5.2.2 reads, “In relation between administrations, all frequency assignments brought into use in conformity with the appropriate Regional Plan and recorded in the Master Register shall be considered to have the same status irrespective of the dates of receipts entered in the Master Register for such frequency assignment. [emphasis added]”. On the contrary by appearance, the Article 5.1.8 states “Complete notices shall be examined in order of receipt”. Upon this comparison, De Man concluded that examination ‘in order of receipt’ is rather ‘an administrative rule’ than ‘a factor for determining priority among competing assignments.’ De Man, *supra*, pp. 93-94, footnotes 176-178.

51) *Ibid.*

52) *Ibid.*, p. 85-86, “The fact that the provision stops short of referring to the notification phase, however, rather appears to confirm the general applicability of the antecedence rule.”

53) De Man, *supra*, p.86.

54) ITU RR, Article 15.23; the factors include adjustment of frequencies, characteristics of transmitting and receiving antennas, time sharing and change of channels.

those used for confirming the ‘interfering’ stations, which have already been deemed of less priority, in the context of dispute settlement amongst the three predetermined actors: States having jurisdiction over the ‘transmitting’, ‘receiving’, and ‘interfering’ stations, as discussed in early part of this chapter. In the second place, he asserted that all relevant factors should be taken into consideration by setting forth the reason that conflicting parties coordinate in the forum in which the legalities of ‘equity’ in both domestic and international laws intermingle. However, the application of ‘equity’ norm to any dispute settlement between contracting States both of which are parties to ITU instruments can be of uniform and unambiguous nature. The Permanent Court of Arbitration (PCA) affirmed this notion as stating:<sup>55)</sup>

The words ‘law and equity’ used in the special agreement of 1921 ... are to be understood to mean general principles of justice as distinguished from any particular system of jurisprudence or the municipal law of any State

In addition, Gourgourinis clarified the fact that the ‘equity’ should be regarded as an expression of ‘corrective’ justice enshrined in positive international laws, not as ‘distributive’ justice embodied in the Article 38 of the ICJ Statute saying ‘ex aequo et bono’.<sup>56)</sup> In this sense, conflicting States in conflict over priority are bound by unified principles, in terms of equitable access to scarce natural resources like orbital slots, within the ITU RR under the umbrella of the ITU CS and subsequent instruments thereof. Therefore, the ‘first come, first served’ rule is not compromised by other factors suggested above.

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55) PCA, Norwegian Shipowners’ Claims (Norway v. The United States), 1922, p. 25, quoted in Anastasios GourGourinis, “Delineating the Normativity of Equity in International Law”, Vol. 11, *International Community Law Review*, 2009, p. 331.

56) Gourgourinis, *Ibid.*, p. 332-335; the author based this on several international court and arbitration cases such as Iron Rhine Railway arbitration (*Kingdom of Belgium v. Kingdom of Netherlands*, 2009), Aroa Mines Case (1903), North Sea Continental Shelf Case (ICJ), and The Indo-Pakistan Western Boundary (Rann of Kutch) between India and Pakistan (*India v. Pakistan*) case.

## (7) Change of Basic Characteristics

The author lastly instantiated the susceptibility of the acquired priority to dissolution: a change of basic characteristics of an already registered assignment, a repeat of ‘the same procedure as is required for registering a new assignment’ in case of the change, and a treat of overdue resubmission of the change as a new notification.<sup>57)</sup> However, the argument lacks an important question to assess the validity of its grounding from the *de facto* proprietary point of view: is going back to the tail of the queue for the notification phase really affecting the ‘first come, first served’ rule? First of all, it is not the same whole new procedures as required for registering a new assignment. The change is solely examined ‘by the BR’ as if it were a new ‘notification’ that has skipped the anterior procedures which a new assignment has to go through.<sup>58)</sup> It implies that if the change is readily assimilated to the existing system and put into normal operation as immediately as the notifying administration files the change, the overarching nature of the ‘first come, first served’ rule will be intact. Most of all, as the author also mentioned, if the change merely conforms to the Table of Frequency Allocations or Plan and ‘the BR’ finds the change favourable in terms of the probability of causing harmful interference and conformity with the procedures relating to coordination, the assignment safely retains the original date of entry in the Master Register.<sup>59)</sup> Therefore, the argument all comes down to one question in reality: who dares to file a change that is likely to cause harmful interference knowing that it would be the basis of unfavourable finding, thus endangering her prerogative obtained through the exhausting formalities? In addition, the ‘basic characteristics’ subject to the conditions above do not include the identity of the satellite network, earth station or radio astronomy station and the symbol of notifying administration.<sup>60)</sup> This exceptional clause paves the road for making the

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57) De Man, *supra.*, p. 87.

58) ITU RR Article 11.43A.

59) ITU RR Article 11.43B.

60) ITU RR, Vol. 2, Appendix 4, Annex 2: Characteristics of satellite networks, earth stations or radio astronomy stations, Table A.2.a and A.1.

best use of the ‘first come, first served’ principle by means of ‘trading’ slots or forming a ‘joint venture’ between slot bearers and plutocratic corporations. It is evidenced by the case of ‘Europe\*Star’. To begin with, a history of Korean space activity should be briefed. The first satellite of the R. O. K. was launched in August 1995. Unfortunately, the launch vehicle failed to place the satellite in an assigned geostationary orbital position.<sup>61)</sup> The wrong delivery constrained the satellite to consume its built-in propellant. It resulted in a curtailment of the expected lifetime of the satellite. However, the accident turned into blessings, in the reported words, for both R. O. K. and EuropeStar. The latter company ‘rented’ at a cost the satellite from R. O. K. to fill its registered orbital slots in the fear of confiscation, in the similar fashion air carriers fly so-called ‘ghost planes’ to defend their take-off and landing slots to the last.<sup>62)</sup> The outcome of such rental strategy unfolded in the ways they both wished; R. O. K. earned the unexpected extra income for which the company managed to preserve their valuable slots.<sup>63)</sup> From the space-born to retirement, the actual proprietor of the satellite is believed to have been KT Corporation, a chosen

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61) Jaeseob Gim, “Mugunghwa-1 Satellite Still in Operation”, The Hankyoreh, April 27 2004, accessed September 2013 at <http://legacy.www.hani.co.kr/section-010100007/2004/04/010100007200404271917215.html>; the Koreasat-1, known as ‘Mugunghwa-1’ by its satellite name, underwent the separating malfunction of an auxiliary booster, a part of the Boeing’s Delta 2 vehicle, due to the exposure to extreme heat. As a result, it fell about 6,100km short of the intended altimeter.

62) Chris Forrest, “Europe\*Star on the Move and Seeking Extra Capacity”, Via Satellite, October 18, 2000, accessed September 2013, <http://www.satellitetoday.com/publications/st/feature/2000/10/18/europestar-on-the-move-and-seeking-extra-capacity>; Europe Star was a joint venture between French Alcatel and American Loral Space. The company, working in close connection with multiple partners, ambitiously registered to the Master Register in 1991 three orbital positions, 43, 45, and 47.5 degrees East, in order to serve customers on the basis of ‘one-stop shopping’ concept which was intended to enable the European stakeholders to ‘reciprocally’ communicate not only between themselves but also with those in the other regions. However, the company had to have the slots occupied with satellites until July 23 2000 as the ITU only tolerates the disuse of the slots for the maximum period of 9 years. However, the delivery of satellites was delayed due to the power-supply problem. As a stopgap measure, the company borrowed the Koreasat-1 located in 116 degrees. It relocated the Koreasat-1 to their slot point, 45 degrees East, at the very moment of the deadline and shifted it again to another slot in 47.5E in October of the same year.

63) Gicheol Lee, “Mugunghwa-1 Retired to Space”, The Seoul Shinmun, December 12 2005, accessed September 24, 2013, <http://www.seoul.co.kr/news/newsView.php?code=seoul&id=20051212011003&keyword=%B9%AB%B1%C3%C8%AD%201%C8%A3>; R. O. K. was paid about \$16 million dollars. The company retained the slots in 45E and 47.5E whereas the other one in 43E was abandoned for it is of less priority according to the CEO, Alain Roger. See *ibid*.

instrument as an operating agency in R. O. K.<sup>64)</sup> The point is that the same satellite had operated in the name of satellite network as ‘Koreasat-1’, ‘Europe\*Star B’<sup>65)</sup> and even in the different type of the orbit.<sup>66)</sup> Asia Broadcast Satellite employed almost the same tactic but the only difference was that ABS rather ‘bought’ than ‘borrowed’ KT’s satellites.<sup>67)</sup> So this was the case with GT&E and Canada.<sup>68)</sup> To be sure, the general policy on reassessment of vested priority due to change of basic characteristics of a registered assignment can hardly affect the ‘first come, first served’ principle in the context of establishing private property right to orbital slots in reality.

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64) The Yonhap News, “Mugunghwa-1 Retired”, December 11 2005, accessed 24 September 2013, <http://news.naver.com/main/read.nhn?mode=LSD&mid=sec&sid1=105&oid=001&aid=0001170853>; It was reported that ‘KT’ had planned to de-orbit the satellite for 4 days from 13 to 16 December 2005.

65) UNIDROIT, “The Preliminary Draft Space Assets Protocol to the Cape Town Convention on International Interests in Mobil Equipment: An Opportunity for Government and Industry to Compare Notes in the Run-up to the Intergovernmental Consultation Process: Summary Report, Appendix I”, October 2003; the ‘Europe\*Star B(a. k. a. Koreasat-1)’ was presented in 47.5E of GEO at the figure of Commercial Communication Satellites, which proves that the satellite moved again from 45E to 47.5E. See *supra*, note 227.

66) Brian Harvey, et al., *Emerging Space Powers: The New Space Program of Asia, the Middle East and South-America*, Springer and Praxis Publishing: United Kingdom, 2010, p. 568; The authors mentioned the satellite, “[Koreasat-1 was] Sold in inclined orbit to Europe\*Star to start to operate in Central Europe under the name of Europe\*Star B [emphasis added]”. However, the satellite was not ‘sold’ as many reports provided the counterexample that it was ‘rented’. The reason why the satellite was operated in the inclined orbit was to prolong the life expectancy of the satellite which was already half-crippled in mobility. See also Gim J., *supra*, note 276; the angle of inclination of the orbital plane with respect to the Earth’s equatorial plane is one of the ‘basic characteristics’ of which the change affects the date of notice. ITU RR, Vol. 2, Appendix 4, A.4.b.4.a.

67) Yeonjin Choi, “Satellites in the sky are tradable”, The Hankookilbo, 12 November 2009, accessed 24 September 2013, <http://news.hankooki.com/lpage/economy/200911/h2009111202404621540.htm>; according to the article, Mugunghwa-2, which had been used under the name of ‘Koreasat-2’, was sold to ABS for the purpose of ‘slot holdout’ when the days of the satellite has almost expired. Ten months later, Koreasat-3 faced the same fate as her senior’s. What KT expected from the trade was operational fee for TT&C (Telemetry, Tracking and Control). For your information, one of the shareholders of ABS is Lockheed Martin Intersputnik (LMI), which manufactured the traded satellites.

68) Harvey J. Levin, “Trading Orbit Spectrum Assignments in the Space Satellite Industry”, Vol. 81, No. 2, *American Economic Review*, 1991, p. 45.

### 3. Verification of the Purposefulness of the Planned Allocation

The purpose of the planned allocation is to ensure the developing to secure orbital slots for their future use on the ground that they lack technical capacity to use the slots at the moment the plan was concluded. In order to fulfil the purposefulness, the effects of the plan should actually guarantee the developing immunity to any interceptive use of the allotted slots by administrations of which the capacity is conceived so predatory in laissez faire environment that scarce but communal resources are prone to monopolization. However, the legal instrument to find a shape that suits the purpose of the plan does not correspond to its fundamental nature. It actually dovetails with the fallacy of the ‘first come, first served’ rule to which the rigid adherence might well end up with the rich-get-richer and the poor-get-poorer in space activities.

#### (1) Broadcasting Satellite Service

Here is a brief description of how the ‘Procedures for modifications to Regional 2 Plan [American continent] or additional uses in the Regions 1 and 3 [Europe and Asian continent]’ in the broadcasting-satellite system (BSS) work. At first, it is proclaimed that any administration applying for a modification or an additional use has to agree with those identified as affected due to the application.<sup>69)</sup> It seems to have been designed to protect those whose pre-allotments are included in the Plan for the moment. However, the proposing administration can file a request<sup>70)</sup> regardless of whether the agreement has been ‘obtained’, and it is immediately followed by the co-ordination procedure<sup>71)</sup> led by the BR which in this stage determines administrations<sup>72)</sup> with which the agreement must be ‘sought’. The bargaining bodies

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69) ITU RR, Appendix 30, Article 4.1.1 and 4.1.2.

70) This must be in full detail in accordance with the Appendix 4 of the RR. Ibid., Article 4.1.3.

71) Ibid., Article 4.1.5 to 4.1.25.

listed in the official Circular by the BR must comment within four-month period otherwise they are deemed to agree with the filing.<sup>73)</sup> Where the problem lies is that if they feel that the proposed assignment will interfere with their future use of the allocated slot thereby using its veto to block the proposal, they have to offer ‘technical reasons’ upon request of the administration seeking the agreement.<sup>74)</sup> This means that the Plan itself is not of explanatory nature to serve its original purpose allowing those who are not capable of using the allocated slot to secure their portion until they are. It rather requires them, at the moment their share is challenged, to put themselves in a circumstance in which they can provide technical specifications; its actual use is only what we can safely assume. Even if they managed to state the technical reasons to disagree, the proposing administration can coercively and provisionally put their assignment in the List of the Plan for Regions 1 and 3 in the case that the assignment in question is not derived from the Plans for 1 and 3 or for Region 2, or in the case that modification procedure to Region 2 Plan has been initiated.<sup>75)</sup> When the provisionally registered assignment holds out only for four-month period without being claimed or causing harmful interference, its status will advance from provisional to ‘definitive’ recording in the List. Therefore, any attempt to incorporate an assignment outside the realm of the Plan is legally open and viable. In addition, it is advisable to read carefully a provision below:<sup>76)</sup>

Where an administration already having included in the List two assignments ..... in the same channel and covering the same service area, proposes to include in the List a new assignment in the same channel over this same service area, it shall apply the following in respect of another administration which has no assignment in the List in the same channel and which proposes to include in the List a new assignment:

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72) The determination is based on the limits in Annex 1 to Appendix 30 that specifies the extent to which the power flux densities in proportion to geocentric orbital separation in degrees are allowed to co-exist with a space station intended to be used by the proposing administration.

73) Article 4.1.5, 4.1.6 and 4.1.10.

74) Article 4.1.16.

75) Article 4.1.18.

76) Article 4.1.25

- a) if the agreement of the former administration *is required* following the application of §4.1 *by the latter administration*, in order to protect the new assignment proposed by the former administration from interference caused by the assignment proposed by the latter administration, both administrations shall make every possible efforts to resolve the difficulties by means of mutually acceptable adjustments to their networks [emphasis added];
- b) in case of continuing disagreement, *and if the former administration has not communicated to the Bureau the information specified in Annex 2 to Resolution 49 (Rev. WRC-2000)*, this administration shall be deemed to have given its agreement to inclusion in the List of the assignment of the latter administration [emphasis added].

According to the Article 4.1, the administration proposing a new assignment is the one that has obligation to initiate the agreement procedure by asking administrations having an assignment which is included in the Plan and identified as affected by the assignment of the proposing administration. However the quoted paragraph above skilfully alludes that the latter requires the agreement of the former in order to protect the new assignment of the former whilst it is unclear that which of the parties propose first in the context of the provision. In the case of continuing disagreement, the former, in other words of the subparagraph b), can overwhelm the will of the latter to oppose the proposed assignment as long as it provide the information detailed in Annex 2 to Resolution 49, which specifies particulars of its space station<sup>77)</sup> that arguably gives weight on the capacity of space-faring nations like the former that have already included two assignments in the List.

Almost the same procedure as aforementioned applies to the modification to Plan for Region 2. As the title of the provision, the Article 4, reads ‘modifications to the Region 2 Plan’ and ‘additional uses in Regions 1 and 3’, the underlying purpose

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77) The Annex 2 to Resolution 49 includes the identity of the satellite network, spacecraft manufacturer, and launch service provider.



of the provision would be for administrations in Region 2 to encroach on the predetermined orbital slots for those located outside their territory for the sake of expansion of their satellite network. This notion is buttressed by the notification procedure enshrined in the same instrument which will be explained in the following paragraph. Moreover, for those who had not participated in the establishment of the Plan, the provision left the door open to the possibility for them to insert *ex post facto* their assignment in the List. However, it has them go through the same co-ordination procedure as applied to the existing participants in the Plan to do so.<sup>78)</sup> Thus the 'first come, first served' principle remains effective to them.

Once a notification of an assignment to a space station in the BSS is placed, the BR examines the notification with regard to those in the following:<sup>79)</sup>

- a) its conformity with the Constitution, the Convention and the relevant provisions of the Radio Regulations (with the exception of those relating to §b), c), d) and e) below);
- b) *its conformity with the appropriate Regional Plan or the Regions 1 and 3 List, as appropriate; or*
- c) the coordination requirements specified in the Remarks column of Article 10 or Article 11; *or*
- d) its conformity with the appropriate Regional Plan or the Regions 1 and 3 List, however, having characteristics differing from those in the appropriate Regional Plan or in the Regions 1 and 3 List, in one or more of the following aspects:  
... ; *or*
- e) *its conformity with the provisions of Resolution 42 (Rev. WRC-03) [emphasis added].*

As shown above, the common denominator of the examination of notification in

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78) *Supra*, Article 4.1.26.

79) Article 5.2.1.

general is only the coherency test with the ITU rules ranging from the RR at the bottom to the Constitution on the top whereas the other assessment components of the examination are elective in accordance with circumstances. Noteworthy are the subparagraph b), d) and e) when the exceptional function of the Plan for BSS against its original purpose is reviewed. The elective elements in practice allow assignments based in the Plan for Region 2 to be utilised within the arena of the Plan for Regions 1 and 3 with application of its effecting provision below:<sup>80)</sup>

In the case of Region 2, where the Bureau reaches a favourable finding with respect to §5.2.1 a) and 5.2.1 c), but an unfavourable finding with respect to §5.2.1 b) and 5.2.1 d), it shall examine the notice with respect to *the successful application of the provisions of Resolution 42 (Rev. WRC-03). A frequency assignment for which the provisions of Resolution 42 have been successfully applied shall be recorded in the Master Register with an appropriate symbol to indicate its interim status.* The date of receipt of the notice by the Bureau shall be entered in the Master Register. In relation between administrations all frequency assignments brought into use following the successful application of the provisions of Resolution 42 (Rev. WRC-03) and recorded in the Master Register *shall be considered to have the same status irrespective of the dates of receipt entered in the Master Register for such frequency assignments.* (WRC-07) [emphasis added]

The provision afore-quoted paved the road to non-conforming use with the Plan. It accommodates assignments which are not derived or having different characteristics from those specified in corresponding Regional Plan to each assignment by the adoption of Resolution 42 that introduced the so-called ‘interim system’. The purpose of the system is clearly enumerated in the preamble of the Resolution stating that administrations in the Region 2 may alternate their initially defined use from an early stage of implementation of the Plan. To offset this exceptional use that arises imbalance between administrations in the Region 2 and the others, several safeguarding clauses<sup>81)</sup> such as the limits on the number of assignments, requirement

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80) Article 5.2.2.2.

to fix their assignments on ‘their’ orbital slots and obligation to obtain agreements of those affected by the interim use are equipped within the instrument. Moreover, the Resolution prevents assignments derived from the interim system from enjoying priority over the registered assignments of administrations in the Regions 1 and 3 in the List.<sup>82)</sup> Despite the ostensibly safeguarding clauses, administrations filing later than those of the interim system, however, must undergo the co-ordination procedure in which the latter can disagree with the former. In addition, the suspended assignments in replace of those of the interim system must still be taken into account when the former seek agreements in their co-ordination phase as a part of the normal conversion process.<sup>83)</sup> Therefore, administrations in the Region 2 can expand their use to the other Regions but the other way around is not possible. This can be carried out in technically advanced ways without physically using the orbital positions allocated to the former.<sup>84)</sup> Lastly, the period for the use of the interim system is initially limited to ten years but can be extended to fourteen years.<sup>85)</sup> In the light that any assignment upon the BSS Plan cannot survive in the List for no longer than 15<sup>86)</sup> years, the possible operation of the interim system for 14 years may encroach the future use of orbital positions specially secured administrations in the Regions 1 and 3.

## (2) Fixed Satellite Service

The FSS Plan also requires that administrations wishing to bring their allotment into use undergo the conversion procedure that ultimately favours the first comers

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81) ITU RR, Vol. 3, Resolution 42, Preamble e) to g).

82) *Ibid.*, Annex to Resolution 42, §3.

83) *Ibid.*, §2,

84) *Ibid.*, §1.1 and 1.2; according to the provisions, an administration may use the interim system in order “to use an increased e. i. r. p. in any direction relative to that appearing in the Region 2 Plan ... to use modulation characteristics different from those appearing in the Annexes to the Region 2 Plan and resulting in an increased probability of harmful interference or in a wider assigned bandwidth; to change the coverage area by displacing boresight, or by increasing the major or minor axis, or by rotating them from an orbital position which shall be one of the corresponding positions appearing in the Region 2 Plan; to use a polarization different from that in the Region 2 Plan.”

85) *Ibid.*, §16.

86) *Supra*, Article 4.1.24.

who do not even have an initial allotment pursuant to the Plan whilst jeopardising the use of the allotments initially ‘planned’.<sup>87)</sup> To grasp the regulatory mechanism that makes the aforesaid practice become reality, the brief description of the procedure therein is as in the following. As steps to pursue one amongst the conversion, addition, and modification, an administration at first files to the BR very detailed information<sup>88)</sup> of an assignment which it proposes to be registered in the List. The BR at this stage only examines the information in regard to its technical conformity with the TFA and how strongly the signal of the intended space station is radiated into the Earth.<sup>89)</sup> However, the conformity to be fulfilled is not only with the TFA. The provision refers to the ‘other provisions of the Radio Regulations, except those provisions relating to the conformity with fixed-satellite service Plan’.<sup>90)</sup> It dictates that the ‘other provisions’ be identified by the Rules of Procedure (RoP) which is approved by the ITU Radio Regulations Board.<sup>91)</sup> The concern here is that the RoP is not open to the public and, importantly, may contain untold clauses having implication on this argument. When the BR sees the first test ‘favourable’, it undertakes to identify, amongst those who have allotment in the Plan or even the first-comers to the List regardless of whether they initially derived their assignments from the Plan,<sup>92)</sup> administrations considered to be affected by the proposed assignment.<sup>93)</sup> The BR has the names of identified authorities circulated then requires that the notifying administration seek and obtain the agreements with the administrations listed in the circular.<sup>94)</sup> The notifying administration thus sets in a co-ordination phase. The

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87) *Supra*, ITU RR, Appendix 30B, Article 6; the provision allows ‘additional system’ to or ‘modification’ of the assignments registered in the List.

88) Appendix 4 to the RR specifies the details.

89) ITU RR, Appendix 30B, Article 6.3; the extent to which the space stations radiate signals to the any portion of the Earth is called ‘power flux density’ and examined in accordance with the Annex 3 to the Appendix.

90) *Ibid.*, Article 6.3 a).

91) *Ibid.*, footnote 6.

92) Administrations which have allotment in the Plan or assignments appearing in the List or assignments that the BR has previously examined but not yet registered it in the List; *ibid.*, Article 6.5.

93) *Ibid.*, Article 6.6.

94) Article 6.7-6.8.

4-month period given to the affected parties to comment is the same as in the BSS Plan. However, the legal effect is reverse when the parties remain silent beyond the time limit: disagreement.<sup>95)</sup> This ‘positive’ system is apt to protect the parties who are, in particular, recklessly unaware or inappropriately not informed to comment when they need to, or has little negotiation power. However, the system changes its nature to ‘negative’ when the notifying administration asks the BR for help in letting the parties open their mouth. Upon receipt of a reminder from the BR, the parties are advised to comment anyway within 30 days otherwise they are deemed to ‘agree’ with the filed assignment.<sup>96)</sup> The BR thereby enters into the second examination with regard to the conformity with the TFA, intensity of the signal, and ‘the requirement for the notifying administration to seek [, not to obtain,] the agreement [emphasis added]’.<sup>97)</sup> The BR of course reviews in its third examination whether the affected administrations whose agreement has not been provided are still considered affected by the proposed assignment. In the case that the BR finds the third review unfavourable, the notice has to be returned but it is not the end of the story. Should the notifying administration resubmit the assignment in question and insist on reconsideration of it, the BR becomes mandated to register the assignment in the List on the only condition that such registry is of provisional nature and not in a position that enjoys protection from harmful interference caused by other assignments for which agreement remains to be obtained.<sup>98)</sup> Therefore, it is virtually possible for those who have capacity to encroach the allotment based on the Plan. Moreover, the ‘first come, first served’ principle still prevails because even the provisionally registered assignments are the ones for which agreement has to be sought by late comers.<sup>99)</sup> This practice is buttressed by that fact that an assignment of a

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95) Article 6.10.

96) Article 6.15.

97) Article 6.19.

98) Article 6.25, 6.26 and 6.29.

99) Article 6.5 and 6.21; “the Bureau shall use the Annex 4 to determine administration whose ... assignments which the Bureau has previously examined under this paragraph after receiving complete information in accordance with §6.1 of this Article, are considered being affected by any assignment in that notice.”

new member state which did not participate in the conclusion of the Plan has priority in the order of examination by the BR over competing administrations, only provided that the examination for their submissions have not yet started.<sup>100)</sup>

### III. Conclusion: The Advent of De Facto Property Rights to Orbital Slot

The use of geostationary orbit (GEO) implies the formidable monetary prestige derived from the three geophysical reasons the other types of orbit cannot render: the advantages over the other types of orbit in regard to the number of satellites that have to be deployed to organise a network for constant coverage, necessity of antenna manoeuvres, and the extra propulsion to maintain the orbital position. This necessitates the examination of the allocative mechanisms for the slots in the GEO for the sake of the fact-finding that serves a further debate on distributive justice in outer space.

In the a posteriori system, De Man opined that the ‘first come, first served’ rule only applies to assignments capable of causing harmful interference. However, this turns out to be void in the proprietary context of the overarching argument of this essay, and amongst others, the securement of the orbital slots. Secondly, the rule of conformity interplays with the antecedence rule, discolouring the dominant role of the latter as to the determination of the priority in the slot allocation. The rule of conformity is, however, overwhelmed in the end by the rule due to the nature of the co-ordination phases and reality that ends up with the sole reliance on the rule. Thirdly, no such irregular registrations as those for provisional or informational purposes fall under the beneficiary of *de facto* property right backed by the ‘first come, first served’ rule within the context of this argument. Fourthly, the dichotomy

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100) Article 7.3, 7.5d) and 7.7.

between the primary and secondary services is a far cry from the one of the factors in abating the impact of the rule. The rule still thrives on allocation in each service. The significance in commercial value of the secondary services falls behind that of the primary ones. So does the portion of the TFA designated to the secondary services. Fifthly, the Rule H40 appears to prevent administrations from taking advantage of the rule. However, it omits the reference to the notification phase, weighing by implication actual use of assignment that favours the space-faring States, thus rendering the Rule H40 nominal. Sixthly, the technical factors and equity norm were put forward as the elements leading to the attenuation of the impact of the rule. The former turns out to be nothing more than the facilitator to pinpoint the source of interference in the context in which aggressors and victims have been predetermined by the rule. The latter is interpreted as a retributive norm rather than as distributive in nature. Therefore, it takes on a different character from the alleged factor as degrading the rule. Lastly, asserted is the vulnerability of a registration to the loss of prestige derived from the rule provided that such registration has any ex post facto changes in the basic characteristics. However, the changes just force the applying administration to repeat merely the notification phase. Should the changes readily be assimilated to the existing system, the assignment in question retains the original date of notification. In sum, the application of the 'first come, first served' principle cannot be disregarded as a determining factor for the securement of the right to international recognition in a posteriori system.

In the BSS Plan, an archetypal a priori allotment scheme, the omission of the obligation to 'obtain' agreements with affected parties by, and technical requirement for dissenting administrations in, additional or modifying assignments to the initial Plan transmutes the Plan in nature from planned distribution to a variant of the 'first come, first served' system in disguise. This perversion is furthered by the unfettered record of disagreed assignment and upgradability thereof from provisional to definite right. The structural imbalance between the-haves and have-nots in the List is found as the former has only to provide certain information at its hand to veto a registration

by the latter of an assignment in conflict with itself. Authorities in the Region 2 can even encroach on the allotments of those in the Regions 1 and 3 under the 'interim system'. Mechanisms enshrined in the system bear similarity to those in the case of additional or modifying assignment aforesaid: the unhampered record of a non-conforming assignment to its own Plan, using frequencies allotted to the other Regions; the equal status given to such provisional registration to which the subsequent assignments even in conformity with the Plan should be subject; the overlapping valid period of the system with the BSS Plan. The FSS Plan has the same mechanisms. It artfully rules out the obligation to 'obtain' the agreement, thereby paving the road to the unfettered provisional registration with which later assignments should seek co-ordination: the 'first come, first served' principle hides in concealment.

From all these considerations based on the analysis of legal mechanisms enshrined in both a posteriori and a priori system for the allocation of the orbital slots, the 'first come, first served' principle matters most, serving the advent of the *de facto* property right to common resources invaluable for radio communication using space stations. Therefore, it leaves much room to be filled with distributive justice on activities in outer space.



## References

- Chatrand, M. R., *Satellite Communication for Nonspecialist*, SPIE: Washington, USA, 2004.
- Nogueira, M., "The Benefits of Low-Earth Orbiting Satellite Technology for the International Community: Can the Potential be Realized?", Vol. 16, *India Journal of Global Legal Studies*, 1998.
- Kim, H., "A Study on the Meaning of Outer Space Treaty in Outer Space", Vol. 28, No. 2, *Korea Journal of Air and Space Law*, 2013.
- Cheng, B., "Introducing a New Term to Space Law: 'Outer Void Space'", Vol. 11, *Korea Journal of Air and Space Law*, 1999.
- De Man, P., "Rights Over Areas Vs Resources in Outer Space: What's The Use of Orbital Slots?", Vol. 38, *Journal of Space Law*, 2012.
- Federal Communications Commission, "Second Order on Reconsideration", FCC-10-188A, November 2010.
- Gourgourinis, A., "Delineating the Normativity of Equity in International Law", Vol. 11, *International Community Law Review*, 2009.
- Harvey, Smid, and Pirad, *Emerging Space Powers: The New Space Program of Asia, the Middle East and South-America*, Springer and Praxis Publishing: United Kingdom, 2010.
- International Civil Aviation Organization, "Annex 10 to the Convention on International Civil Aviation: Aeronautical Telecommunications, Volume II - Communication Procedures including those with PANS status", Sixth Edition, October 2001.
- International Civil Aviation Organization, "Priority Definitions within Annex 10 and the Relationships to the ATN SARPs", ATNP WG2/WP139, July 1995.
- International Telecommunication Union, "Regulation of global broadband satellite communication", April 2012.
- Jakhu, R., "Legal Issues Relating to the Global Public Interest in Outer Space", Vol.

- 32, No. 1, *Journal of Space Law*, 2006.
- Leive, D. M., "Regulating the Use of the Radio Spectrum", Vol. 5, *Stanford Journal of International Studies*, 1970.
- Leive, D. M., *International Telecommunications and International Law: The Regulation of the Radio Spectrum*, Sijthoff, 1970, quoted in De Man, "Rights Over Areas Vs Resources in Outer Space: What's The Use of Orbital Slots?", Vol. 38, *Journal of Space Law*, 2012.
- Levin, H. J., "Trading Orbit Spectrum Assignments in the Space Satellite Industry", Vol. 81, No. 2, *American Economic Review*, 1991.
- Nogueira, M., "The Benefits of Low-Earth Orbiting Satellite Technology for the International Community: Can the Potential be Realized?", Vol. 16, *India Journal of Global Legal Studies*, 1998.
- UNIDROIT, "The Preliminary Draft Space Assets Protocol to the Cape Town Convention on International Interests in Mobil Equipment: An Opportunity for Government and Industry to Compare Notes in the Run-up to the Intergovernmental Consultation Process: Summary Report, Appendix I", October 2003.
- Wilson, J., "The International Telecommunication Union and the Geostationary Orbit: an Overview", Vol. 23, *Annals of Air and Space Law*, 1998.
- Dunstan, J. E., "Toward a Unified Theory of Space Property Rights: Sometimes the Best Way to Predict the Weather Is To Look Outside", in *Space: The Free Market Frontier*, eds., Edward L. Hudgins, Cato Institute, Washington D. C., pp. 229-231, 2002.
- Zhao, Li, Wang, Zheng and Yu, "Research and Technology of Electromagnetic Compatibility Technology", Vol. 7, No. 9, *Journal of Computers*, 2012.

## Abstract

### A Review Essay on Legal Mechanisms for Orbital Slot Allocation

Jung, Joon-Sik · Hwang, Ho-Won

This paper analyses from the perspective of distributive justice the legal mechanisms for international allocation of orbital slots, which are of co-owned nature and thereby limited natural resources in outer space.

The allocative function is delegated to the International Telecommunication Union. The Radio Regulation, amongst such other legal instruments as the Constitution and Convention, by which the ITU and contracting States thereof abides, dictates how the orbital positions are distributed. Thus, the RR is thoroughly reviewed in the essay. The mechanisms are in a broad sense categorized into two systems: ‘a posteriori system’ where the ‘first come, first served’ principle prevails; and ‘a priori system’ designed to foster the utilisation of the slots by those who lack space resources and are, in especial, likely to be marginalised under the former system.

The argument proceeds on the premise that a posteriori system places the under-resourced States in unfavourable positions in the securement of the slots. In contrast with this notion, seven factors were instantiated for an assertion that the degradation of the distributive justice derived from the ‘first come, first served’ rule, which lays the foundation for the system, could be either mitigated or counterbalanced by the alleged exceptions to the rule. However, the author of this essay argues for counterevidences against the factors and thereby demonstrating that the principle still remains as an overwhelming doctrine, posing a threat to the pursuit of fair allocation. The elements he set forth are as in the following: 1) that the ‘first come, first served’ principle only applies to assignments capable of causing harmful interferences; 2) the interoperability of the principle with the ‘rule of conformity’ with the all the ITU instruments; 3) the viability of alternative registrations, as an exception of the

application of the principle, on the condition of provisional and informational purposes; 4) another reference that matters in deciding the priority: the types of services in the TFA; 5) the Rule of Procedure H40 proclaiming a ban on taking advantage of coming first to the Register; 6) the technical factors and equity-oriented norms under international and municipal laws along with; 7) the changes of 'basic characteristics' of registered assignments.

The second half of this essay illustrates by examining the relevant Annexes to the Regulation that the planned allocation, i.e., a priori system, bear the structured flaws that hinder the fulfillment of the original purpose of the system. The Broadcasting and Fixed Satellite Systems are the reviewed Plans in which the 'first come, first served' principle re-emerges in the end as a determining factor to grant the 'right to international recognition' to administrations including those who has not the allotted portions in the Plan.

**Key Words** : ITU, Geostationary Orbit, Distributive Justice, Orbital Slot, Radio Regulations, A Posteriori System, A Prior System, Allocative Mechanisms, First-Come-First-Served Principle

## 초 록

### 정지궤도슬롯의 법적 배분기제에 관한 논고

정준식 · 황호원

본 논문은 인류가 공유해야 할 유한한 우주자원인 정지궤도(*geostationary orbit*)의 국제적 배분기제를 분배적 정의의 관점에서 분석한 것이다.

배분의 주체인 국제통신연합(ITU)은 계약국이 합의한 현장 및 협약의 하위규정인 무선규칙에 의해 주파수와 궤도자원을 분배하고 있으므로 논문은 무선규칙을 세밀히 검토하는데 중점을 두었다. 현행 배분메커니즘은 크게 두 가지 원칙에 따른다. 하나는 먼저 등록한 행정청에 우선권을 주는 선착순 원칙('first come, first served' principle)에 의한 사후배분체제(*a posteriori system*)이고, 다른 하나는 선착순원칙을 적용할 경우 배제될 수 있는 국가(행정청)를 위해 미리 계획을 통하여 배분하는 사전배분체제(*a priori system*)이다.

논의는 우선 사후배분체제가 우주후진국에 불리하다는 확립된 관점을 전제로 출발한다. Philip De Man은 사후배분체제의 기저에 있는 선착순원칙에도 예외가 있다면서 이에 관한 7가지의 예를 들어 선착순원칙에 의한 배분적 정의의 형해화 가능성이 배제될 수 있음을 보여주려 시도한다. 하지만 본 논문은 그가 주장하는 각각의 논거에 대해 반박하고, 이를 근거로 여전히 선착순원칙이 대부분의 우주자원배분에 적용되고 있으며 따라서 배분적 평등의 실현에 걸림돌이 되고 있음을 보여준다. De Man이 주장하는 근거는 다음과 같다: 1) 선착순 원칙은 유해간섭을 일으키는 할당에만 적용된다; 2) 선착순 원칙 외에도 국제적 권리의 형성에는 규정합치성원칙(*rule of conformity*)이 상호 적용된다; 3) 선착순 원칙에 반해 정보목적 및 임시로 등록이 가능하다; 4) 선착순 원칙 외에도 서비스의 종류에 따른 우선순위가 존재한다; 5) 먼저 등록했다는 사실만으로는 이득을 볼 수 없도록 선언한 절차규정(*Rule of Procedure*)이 있다; 6) 선착순 원칙과 동등하게 적용되는 기술적 요소의 고려와 국제 및 국내법에 따른 평등원칙이 있다; 7) 할당의 기본성격(*basic characteristics*)에 변경이 있을 경우 선착순 원칙이 배제된다.

논의의 또 다른 부분은 우주후진국을 위한 사전배분체제마저도 그 본래의 목적을 달성할 수 없으며, 이를 가능케 하는 구조화된 메커니즘을 관련 무선규칙과 그 부속서의 면밀한 분석을 통해 밝혀낸다. 분석대상은 방송위성계획(Broadcasting-Satellite System) 및 고정위성계획(Fixed-Satellite System)에 따라 각 행정청이 자신의 할당을 국제적으로 등록하는 세부절차이며, 이 사전배분체제 에서도 선착순원칙이 압도하고 있음을 드러내면서 본 논문의 주장을 뒷받침한다.

**주제어 :** 국제통신연합, 정지궤도, 배분적 정의, 궤도슬롯, 무선규칙, 사전배분, 사후배분, 배분기제, 선착순원칙