

# ITU Framework: A Model for an International Regime of Space Resources?

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## 1. Introduction

Recently, the question of an international regime of space resources activities has been subject of extensive debates in various fora - in the UN COPUOS, international non-governmental groups such as the International Institute of Space Law and The Hague Space Resources Governance Working Group, and on the national level. Undoubtedly, the central role in these discussions belongs to the Legal Subcommittee of the UN COPUOS; however, the discussions in other bodies are preparing the floor for a global debate by collecting know-how and opinions, which can be taken into account in the later stage.

One of the questions which can be raised in this context is whether in these debates, the experience of other international regimes administrating common goods can be useful. There are several models that can be used as analogs. There is, for example, the experience of the International Seabed Authority that concludes contracts for exploration of sea-bed minerals.<sup>1</sup> However, it seems to be justified to argue that the practice of the International Telecommunication Union (ITU) in coordinating the uses of the radio spectrum and space orbits is a better example in this context. The ITU model is attractive not only for its pragmatism in managing diverging interests, but primarily for the number of successfully coordinated satellite systems, as well as cases of harmful interference which could be settled amicably, without once using the ITU Arbitration Procedure provisions.<sup>2</sup>

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1 [www.isa.org.jm](http://www.isa.org.jm); until now, the International Seabed Authority has entered into contracts with 29 contractors.

2 Srinivasan Venkatasubramanian, ITU and its Dispute Settlement Mechanism, in Mahulena Hofmann (ed.), *Dispute Settlement in the Area of Space Communication*, Nomos/ Hard 2015, 23-32.

This contribution shall examine which elements of the ITU framework would be transferable to the future international regime of space resources activities. First, it will give a short description of space resources activities that shall then be followed by an overview of the main characteristics of the ITU regime, which may be relevant from the perspective of space “mining”. Furthermore, it shall describe the provisions of the document published by The Hague Space Resources Governance Group, the Building Blocks,<sup>3</sup> which show several close resemblances with the ITU regime. Finally, the contribution shall evaluate whether and to what extent the ITU regime can serve as a model for the space resources area. It shall not deal with the question of the allocation of specific frequency bands for space resources activities; this is another open issue but must be analysed separately.

## 2. Space Resources Activities

In the wording of the Building Blocks of The Hague Space Resources Governance Group, space resources activities are understood as activities conducted in outer space for the purpose of searching for space resources, the recovery of those resources, and the extraction of raw mineral or volatile materials therefrom, including the construction and operation of associated extraction, processing and transportation systems.<sup>4</sup>

It is obvious from this definition that these activities may provoke situations with legal implications: potential operators under different jurisdictions may be interested in the same area containing minerals; they might wish to establish safety zones; they may interfere with space resources activities of anyone else; they might be responsible for deteriorating the environment on a celestial body; or they might damage an object belonging to someone else, leaving aside the legal problems of the less probable consummation of a whole celestial body by an operator.<sup>5</sup>

If the activity would affect the legal position of a natural or legal person from the same jurisdiction, the issue will be solved primarily on the basis of a national law of the State which authorized the space activity. If the operators would belong to different jurisdictions, the UN space law regime would be applicable, together with general international law. Their provisions are, however, of relatively general nature. It seems to be worthwhile to examine how analogical, transboundary situations would be solved on the basis of the ITU framework.

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3 The Hague Working Group Draft Building Blocks on Space Resources Activities 2017, September 2017.

4 Building Block (BB) 2.

5 To these plans, see Scott Anderson, Korey Christensen and Julia LaManna, *The Development of Space Resources in Outer Space*, *Journal of Energy and Natural Resources Law*, 2018, 15-17.

### 3. Scope of the ITU Framework

It has to be underlined that the principal purpose of the modern ITU – an international intergovernmental organisation and a specialised agency under Article 57 of the UN Charter – is to administer specific natural resources – radio-frequency spectrum and associated orbits, including the geostationary orbit (GSO).<sup>6</sup> In relation to space activities, the ITU framework regulates those as long as they need electromagnetic frequencies, or eventually specific orbital slots. It does not provide for provisions dealing with the material existence of space objects – this field is left to the international law of outer space.

From the historical perspective, it can be remarked, however, that the division of competences between the UN regulating space activities and the ITU was not always as sharp. Several attempts to regulate the use of some orbits for space services, especially the GSO, took place also on the floor of the UN COPUOS, especially its Legal Subcommittee. The first 1961 UN GA resolutions on the International Co-operation in the Peaceful Uses of Outer Space devoted an entire section to space communication and welcomed the calling of a special conference of the ITU to make allocations for radio frequency bands for outer space activities.<sup>7</sup> In the following discussions on the UN floor, an emblematic role was played by the 1976 Bogota Declaration adopted by six equatorial States that declared that the arc of the GSO located directly above their respective territories should be treated as a part of their national territories.

An analogy between a regime of radio frequencies and space orbits is possible because the spectrum and orbits are declared, by the ITU Constitution, to be “limited natural resources” that must be used “rationally, efficiently and economically”.<sup>8</sup> It has to be seen, however, that – without regard to the philosophical question of the endlessness of space – spectrum and orbits are renewable resources, whereas space minerals are not.

### 4. The Method of Adoption of Rules and the Involvement of the Operators

The first, procedural question which might be of interest for the operators of space resources activities might be the intensity of their involvement in the discussions on adoption of rules influencing the future international regime of “space mining”. The example of the ITU regime shows that a broad involvement of non-states actors in the legislative procedure is possible.

Naturally, the basis of all activities of the ITU are its 193 Member States; this number is identical to the number of UN members and serves for the universal character of the ITU. Only the representatives of the states have full voting

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6 Article 44 of the ITU Constitution.

7 Resolution 1721 of 20 December 1961.

8 ITU Constitution, Article 44.2.

rights in all plenipotentiary or world conferences.<sup>9</sup> However, in addition to the Member States and in order to include partners from the public and private sectors, ITU includes in its activities more than 700 *Sector Members and Associates* from industry, international and regional organisations, and academia. These members are entitled to participate in all activities of the Sector of which they are members and are entitled to participate in the adoption of recommendations and procedural decisions of that Sector.<sup>10</sup>

The expert workload of the ITU is divided among three Sectors. First, the *Radiocommunication Sector*<sup>11</sup> deals with the use of the frequency spectrum and satellite orbits. It calls world communication conferences that revise the rules for the coordination of the use of frequencies and satellite orbits. The work of this Sector is organised by the *Radio-communication Bureau*, which, *inter alia*, keeps the *Master International Frequency Register* (MIFR) - an international register of frequencies assigned by the national telecommunication administrations that serves as basis for international recognition of such assignments - and assists member States in cases of harmful interference with their communication. Furthermore, this Sector works also through the *Radio Regulations Board* (RRB), which is composed of not more than twelve members elected by the Plenipotentiary Conference on the basis of equitable geographic distribution amongst the regions of the world. RRB members act as custodians of an international public trust and enjoy functional privileges and immunities when performing their function.<sup>12</sup> The RRB usually meets four times a year to approve the Rules of Procedure for registration of frequency assignments made by ITU Member States, to consider reports from the Director of the Radiocommunication Bureau on investigations of cases of harmful interference carried out at the request of one or more of the interested administrations, and to formulate recommendations on how to resolve such interference. Independent of the Radio-communication Bureau, the RRB can also, at the request of one or more administrations, consider appeals against decisions made by the Bureau regarding frequency assignments. The Board endeavors to reach its decisions unanimously, but if it fails to do so, at least two-thirds of the members have to vote in favor of a decision for it to be valid.

The second sector is the *Telecommunication Standardization Sector*<sup>13</sup> that studies technical, operating, and tariff questions, and it adopts recommendations on these topics with the view to standardizing telecommunication on a worldwide basis. The third sector is the

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9 ITU Convention, Article 1.

10 ITU Convention, Article 3.

11 ITU Constitution, Article 12.

12 ITU Constitution, Article 14; ITU Convention, Article 10.

13 ITU Constitution, Article 17.

*Telecommunication Development Sector*<sup>14</sup> that delivers technical assistance aimed at the creation, development and improvement of telecommunication and ICT equipment and networks in developing countries.

In context to space resources activities, it would be possible to think about an analogical model of involving the non-state actors in the procedure of adoption of rules. The operators could be organized in expert bodies, which would serve for exchanges of information and expertise and formulate and transpose their positions to international bodies composed of State representatives. They could be also directly involved in preparatory works leading to the adoption and amendment of the provisions establishing the international regime.

Also, the Hague Space Resources Governance Working Group has included the space resources operators in its activities. The industrial stakeholders are represented in the debates as members of the Working Group, or of one of the two panels – the Technical Panel, and the Social-Economic Panel. These “foster dialogue and cooperation between governments, industry, international organizations, academia and civil society on the technical and socio-economic aspects of space resources activities; identify technical and socio-economic challenges related to the use of space resources; advise the WG about the current status of developments and feasibility on the implementation of the proposed building blocks and propose new, if required; act as the technical and socio-economic arm of the WG in international fora.”<sup>15</sup>

## 5. Main Instruments

The basic legal instruments of the ITU are the ITU Constitution and the ITU Convention.<sup>16</sup> These texts are complemented by the Administrative Regulations, in particular the Radio Regulations.<sup>17</sup>

The Radio Regulations represent the most flexible set of binding legal rules on radio communication adopted by the ITU, as they can be amended by the World Administrative Conferences. Amending the Radio Regulations only requires a majority of more than half the delegations present and voting.

Transferred to the area of space resources, it would be also possible to introduce a system of one more general international instrument, accompanied by regulations analogical to Radio Regulations which could be amended regularly in accordance with the technological developments, and

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14 ITU Constitution, Article 21.

15 <https://www.universiteitleiden.nl/en/law/institute-of-public-law/institute-for-air-space-law/the-hague-space-resources-governance-working-group>.

16 Constitution of the International Telecommunication Union, 22 Dec. 1992, 1825 UNTS 330 (CS); Convention of the International Telecommunication Union, 22 Dec. 1992, 1825 UNTS 330 (CV).

17 Radio Regulations, ITU, Edition of 2012.

applied in good will not only by States, but also by the operators. The link between the States and the operators under their jurisdiction is based on Article VI of the Outer Space Treaty (OST).<sup>18</sup> In case of the ITU regime, it is the traditional principle that the member States of the Union are bound to abide by the ITU regime in “all stations” that engage in international services or are capable of causing harmful interference to radio stations of other countries<sup>19</sup> as well as the rule that “no transmitting station may be established or operated by a private person or by an enterprise without a license issued in an appropriate form” by a country to which the station is a subject.<sup>20</sup>

Also the Hague Building Blocks stress the need of a dynamic adaptation of the envisaged international framework to the changing conditions. The Introduction to the document stresses that “guided by the principle of adaptive governance, the Working Group considered it neither necessary, nor feasible to attempt to comprehensively address space resources activities in the building blocks: space resources activities should be incrementally addressed at the appropriate time on the basis of contemporary technology and practices”. Principle 4 of the Blocks suggests that the international framework is designed so as to regulate these activities at the appropriate time; principle 19 recommends that “mechanisms should be developed for the “review and further development” of the international framework. Concerning the applicability of the Building Blocks to the operators, this is constructed in accordance with Article VI Outer Space Treaty. The States and international organisations shall be “responsible for space resources activities authorized by them in accordance with their international obligations”; the international framework should provide that these activities “requires prior authorization and continuing supervision” by the appropriate State or intergovernmental organization.<sup>21</sup>

## 6. Priority Rights

In the Introduction to this contribution, we remarked that one of the situations that occupies space lawyers is the interest of two operators from different jurisdictions in search and extraction of space resources from the same part of a celestial body. This conflict could be trivialized with reference to the vastness and endlessness of outer space; the experience of the ITU, and specifically the use of the frequencies and slots on the geostationary orbit, proves that certain intensity of space activities could indeed lead to conflicting interests in using the same space.

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18 UNTS, vol. 610, No. 8843.

19 Article 6 ITU Constitution.

20 Article 18.1 ITU Radio Regulations.

21 Building Block 5.

The Outer Space Treaty has only general answers to this issue. It declares outer space “free for exploration and use”,<sup>22</sup> and there shall be a “free access to all areas of celestial bodies”.<sup>23</sup> All activities shall be conducted with “due regard to the corresponding interests of all other States Parties to the Treaty”.<sup>24</sup> All stations, installations, equipment and space vehicles on celestial bodies shall be open to representatives of other States Parties on the basis of reciprocity, after a reasonable advance notice and appropriate consultations.<sup>25</sup>

How is this issue approached by the ITU regime? The Radio Regulations contain provisions for the coordination, notification and international recording of individual frequencies or orbital needs. This model is based on the system of “assignments” of a radio frequency or channel - an authorization given by a national administration for a specific radio station to use a radio frequency or radio frequency channel. If the station would transmit across international boundaries, or is capable of causing harmful interference to the stations in other countries, this authorization has to be issued in accordance with the ITU provisions, and in case of the majority of satellite networks or systems, it must be coordinated on the international level. The first step of the future space service operator may therefore lead to the appropriate national administration responsible for the tasks vested to the ITU on the national level to define needs for frequencies envisaged in the project. If the frequency complies with the ITU Table of Frequency Allocations, for a satellite network or a satellite system in the bands which are not subject to the coordination procedure, the national administration would send a general description of the planned network or system to the Radiocommunication Bureau of the ITU for advance publication in the International Frequency Information Circular (BR IFIC). This can happen “not earlier than seven years and preferably not later than two years before the planned date of bringing it into use” (BIU).

This advanced publication allows other administrations to react to these plans. If they would consider that any of their existing or planned satellite systems or terrestrial stations might be affected by the planned station, they may send their comments directly to the publishing administration, and both institutions are obliged to “endeavor to cooperate on joint efforts to resolve any difficulties.” The Radio Regulations define in which cases a coordination procedure with other administrations that might be affected by the signals is obligatory, such as in the case of projects envisaged to place a space object with a radio station onboard into the geostationary orbit or in the

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22 Article I OST.

23 Ibid.

24 Article IX OST

25 Article XII OST.

case of the use other Earth orbits for fixed satellite service in specific frequency bands.<sup>26</sup>

The first two steps of the procedure (advance publication and coordination) for GSO networks and non-GSO networks any systems subject to coordination have been streamlined by the WRC-15. Consequently, no requirement of advance publication has to be sent to the Bureau in addition to the coordination request. The Bureau shall publish the general description of the network or system upon the receipt of the complete coordination information, using the characteristics embodied in the coordination request.

The administration that receives the request for coordination examines the matter with regard to the interference that might be caused to or by its own frequency assignments, and suggests how the potential interference with its communications might be avoided. In cases of disagreement between the two administrations, the ITU Radiocommunication Bureau may be asked to assist in finding a solution. In cases of a continuing disagreement, the Radio Regulations Board can take a respective decision,<sup>27</sup> which may be revoked, at least theoretically, by the upcoming WRC.

Independent from the coordination procedure and in cases enumerated by the Radio Regulations, new national frequency assignments or a change of an already registered assignment have to be notified to the ITU Radiocommunication Bureau.<sup>28</sup> This obligation has to be fulfilled, for example, for assignments capable of causing harmful interference to any service of other administrations; for assignments used for international radiocommunication; for the frequencies subject to an international allotment plan; for frequencies that are subject to the coordination procedure; and for all assignments which seek to obtain international recognition by their recording in the Master International Frequency Register (MIFR).<sup>29</sup>

In these cases, the administration has to provide the necessary characteristics of the new assignment to the Radiocommunication Bureau, which examines its conformity with the Table of Frequencies Allocations with respect to harmful interference potentially caused by it, and, as in the case of the majority of space services, to procedures relating to coordination with other administrations. When its examination leads to a favorable finding, the respective frequency assignment shall be recorded in the MIFR. This recording leads to “the right to international recognition” of the assignment, which means that other administrations not only have to take it into account when making their own assignments, but also have to avoid and “immediately eliminate” any harmful interference to stations using this

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26 Article 9 Radio Regulations.

27 ITU Convention, Article 10 (2).

28 Article 11 Radio Regulations.

29 Article 11 Radio Regulations.

assignment.<sup>30</sup> An unfavorable finding of the notice would be returned to the notifying administration with an indication of the appropriate action to be taken.

In cases specified by the Radio Regulations, a favorable finding can be cancelled.<sup>31</sup> A typical case would be the situation when the announced network has not been brought into use (BIU) in the time frame defined by the Radio Regulations. As mentioned above, the operator has a time slot of seven years since the receipt of the advance information about the intention to use the frequency by the Radiocommunication Bureau to bring the assignment into use.

Transposed to the space resources activities, the operators would initially communicate with their States of jurisdiction when seeking international recognition of their priority rights. They would apply for national authorization of their missions as it is already envisaged by Article VI of the Outer Space Treaty. Their intention would be published in advance internationally to allow for reactions or international coordination. In cases of collision with interests of operators from other jurisdictions, an international body would be entitled to mediate between these States. The completion of the coordination procedures with other administrations would lead to recording their right to use a specific area on a celestial body in a specific international registry. This recording would represent “international recognition” of this right; subsequent operators would have to take it into account when planning and notifying their projects.

It remains open whether this traditional approach of the ITU, the procedural principle “first come, first served” and the coordination between existing satellite systems and newcomers’ radio stations should be enlarged by the method of “*a priori planning*” also in the area of space resources. The fast filling up of the geostationary positions by the satellites of technologically advanced countries led, in the 1970s, to the fears of less developed States that by the time that they would be technologically capable of deploying satellite services that all the favorable orbital positions on the GSO would already be occupied. This perspective led them to the policy that at least some parts of the GSO should be reserved for an “equitable use” by all members of the ITU, independent of whether they are technologically capable of using them at the moment. The objective of this method is to guarantee that all countries have access to the GSO and the respective frequency bands, without the need to make filings and coordinate a satellite network.

Crucial in planning the use of GSO was the 1988 World Administrative Radio Conference on the Use of the Geostationary-Satellite Orbit (WARC ORB-88) aiming to provide guaranteed access by all States to the space services using this orbit. Its main result was an adoption of a worldwide (i.e.

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30 Article 8 Radio Regulations.

31 Article 11 Radio Regulations.

not separated by Regions) Allotment Plan that provides each country with one orbital position on the GSO and with the associated frequencies for one national satellite providing domestic fixed satellite services (FSS) (800 MHz bandwidth). As a result, e.g. each Member State of the ITU benefits from the allocation of 500 MHz in the Ku band at a single orbital position with a national beam for its planned FSS and no coordination is required with other networks if the orbital spacing is greater than 9 in the Ku-Band. In the C-Band, there is an allocation of 300 MHz to each country at one single position with a national beam.<sup>32</sup>

The plans for specific GSO orbital slots and respective frequencies were important for less developed countries for several reasons. First, they facilitate equitable access to a certain part of the frequency and orbit resource. Second, the beams cover the whole national territory of each Administration. Third, despite the fact that not all Plan assignments are currently in operation, they cannot be simply cancelled as it is the case of the non-planned assignments when the deadline to bring a system into operation (BIU) has not been respected. Finally, the systems have to be notified like the non-planned system, but it is the Plan and not the notification that guarantees the protection of the particular orbital slot and the appropriate frequency. Also, the protection of the planned systems from harmful interference is based on the technical characteristics, and not on the characteristics entered into the Master Register at the notification stage.

However, the ITU website “Bringing into Use Satellite Network Frequency Assignments”<sup>33</sup> is showing that only 30 administrations brought into use satellite networks following the Appendix 30/30A (BSS Plan) and 28 administrations brought into use satellite networks according the Appendix 30/30B (FSS Plan). The less technologically developed countries are frequently searching for other means to satisfy their telecommunication needs.

A view into The Hague Building Blocks reveal that no *a priori* planning of space resources has been envisaged by the Group until now. The search for space resources should be unrestricted,<sup>34</sup> and the international framework regulating the extraction of space resources *in situ* should enable the attribution of priority rights to the operators upon a registration in an international registry, which provides for their international recognition.<sup>35</sup>

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32 See Roland Thurmes, Luxembourg Administration as Notifying Administration of an International Commercial Operator, in: M. Hofmann (ed.), *International Regulations of Space Communication*, Larcier 2013, 173 ff.

33 <https://www.itu.int/net/ITU-R/space/snl/litsinuse/index.asp>.

34 Building Block 6.1.

35 Building Block 6.2., 13 and 17.

## 7. Harmful Interference

Prevention against harmful interference to radiocommunication services is the crucial task of the ITU system.<sup>36</sup> In this context, it should be noted that not every interference with radiocommunication service is harmful. The Radio Regulations differentiate between permissible interference, accepted interference, and harmful interference. Only interference that endangers the functioning of a radio navigation service or of other safety service, or “seriously degrades, obstructs, or repeatedly interrupts” a radio communication service operating in accordance with Radio Regulations is considered harmful.<sup>37</sup>

The core of combatting harmful interference lays in the planning stage. Therefore, the ITU Member States are obliged to take all practicable steps to prevent the operation of electrical apparatus and installations of all kinds from causing harmful interference to the radio services or communications of other countries. However, there are cases in which interference takes place, despite the legislative, administrative, or practical measures taken by Member States. For such situations, Radio Regulations offer a set of binding procedures that assist the administrations in finding a source of the interference and in entering into negotiations with the administration having jurisdiction over the station causing it.<sup>38</sup>

If such situation occurs, the first step is reporting the interference to the administration of the country having jurisdiction over the station of interference, which should ascertain the facts, fix the responsibility, and take the necessary action. In the majority of cases, the problem is settled in this stage of procedure. If the steps taken have not produced satisfactory results, the administration concerned can inform the Radiocommunication Bureau, which on the basis of the information available from different sources should attempt to identify the source of harmful interference and request the administration believed to be responsible, for prompt action. If this procedure does not lead to any positive solution, the case can then be brought to the attention of the RRB, which can formulate recommendations how to resolve it.

The WRC-12 brought a new, significant power of the Radiocommunication Bureau to initiate the cancelling of a favorable assignment related to satellite networks in the ‘hard’ cases of harmful interference. In such cases, should any administration involved in the matter inform the Bureau that all efforts to resolve the harmful interference have failed, the Bureau should inform other involved administrations and prepare a report, together with all necessary supporting documents, for the next meeting of the Radio Regulations Board

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36 See the contributions to the publication *Harmful Interference in Regulatory Perspective* (ed. M. Hofmann), Ashgate/ Nomos 2015.

37 Article 1.169 Radio Regulations.

38 Article 15 Radio Regulations.

for its consideration and any required action, “including the possible cancellation of the assignment recorded.”<sup>39</sup> Through this approach, respect for the non-interference principle can be enforced. The decision of the Board and the Radiocommunication Bureau can be “appealed” in the World Radiocommunication Conference.

Seen from the perspective of the UN space law treaties, Article IX OST requires its Parties to undertake appropriate international consultations before proceedings of any activity or experiment, which – on their own opinion – may cause harmful interference with activities of other States. The State Party that has reason to believe that an activity planned by another State Party in outer space could cause harmful interference with activities in the peaceful exploration and uses of outer space, may request consultations concerning the activity or experiment.<sup>40</sup> It is questionable whether this regime is sufficient for the prevention and avoidance of harmful interference during potential regular activities on celestial bodies.

If the ITU framework, especially Article 15 of Radio Regulations would be transposed to space resources activities, it would mean that the operators suffering harmful interference with their activities would report this fact to their administration; this would inform the administration of the source of interference which should ascertain the facts, fix the responsibility, and take the necessary action. If these steps would not produce satisfactory results, the administration concerned would inform the appropriate international body which on the basis of the information available from different sources should attempt to identify the characteristic of harmful interference and request the administration believed to be responsible, for prompt action. If this procedure would not lead to any positive solution, the appropriate international body would formulate recommendations how to resolve it.

It can be considered whether the method adopted recently by the ITU - cancelling a registration in the international register of operator rights – should be transposed in the international regime of space resources activities. This legal step would penalize the ‘hard’ cases of harmful interference to the rights of operators under differing jurisdictions. In such cases, should any administration involved in the matter inform the international body that all efforts to resolve the harmful interference have failed, this body would inform other involved administrations and prepare a report, together with all necessary supporting documents for consideration and any required action, “including the possible cancellation of the assignment recorded”,<sup>41</sup> through

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39 Article 11/42 A Radio Regulations.

40 Frans von der Dunk, *The Space Side to ‘Harmful Interference’ – Evaluating Regulatory Instruments in Addressing Interference Issues in the Context of Satellite Communication*, in m. Hofmann (ed.). *Harmful Interference in Regulatory Perspective*, Nomos/ Ashgate 2015, 87 ff.

41 Article 11/42 A Radio Regulations.

this approach, respect for the non-interference principle could be further intensified.

The Hague Building Blocks deal with the issue of harmful interference on several locations: Beginning from the “due regard” principle,<sup>42</sup> the document requires that the future international framework provides that space resources activities shall not harmfully interfere with other on-going space activities, including other space resources activities.<sup>43</sup> Overlapping interests of operators from different jurisdictions should be avoided through registering priority rights of operators on national level,<sup>44</sup> notifying authorized national space resources activities through an international repository, and an existence of an international registry governed by an established “international body”;<sup>45</sup> the entry in this registry would result in international recognition of priority rights of operators.<sup>46</sup>

Specific provisions deal with the establishment of safety zones around areas identified for space resources activities preventing harmful interference with space resources activities. The future international framework should permit States and intergovernmental organizations to establish such zones in order to assure safety and to avoid any harmful interference with that space activity. A safety zone should not impede the free access to any area of outer space of personnel, vehicles, and equipment of other entities conducting space resources activities.<sup>47</sup>

## 8. Conclusion

After having had a look on the UN space law regime applicable to space resources activities, analyzed the ITU framework, and mentioned the first effort to formulate rules suitable to serve as elements of a future international regime of space resources, let us conclude whether and which provisions of the ITU regime would be transferable to the future regime of space resources activities.

Let us start with the parts of the ITU regime that do not have any answer to the regulatory needs of space resources activities. As an example, the ITU regime does not react to the issues of the protection of environment, or the damage caused by or to space objects, specifically objects not launched from the Earth. Based on the provisions of the UN space treaties, these have to be developed autonomously or on the basis of the models of other areas of international law.

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42 Building Block 8.

43 Building Blocks 4 and 9.

44 Building Block 13.

45 Building Block 17.

46 Building Block 6.

47 Building Block 10.

However, there are numerous provisions which could serve as a model for space resources activities. First, the positive experience of the ITU with the involvement of non-governmental entities into the work of its three Sectors and their participation in the elaboration of rules could serve as an attractive example for the operators of space resources missions. Second, the structure of the legal instruments of the ITU – the existence of general norms adopted by a qualified majority of Member States and the function of more detailed, more technical provisions adopted by a lower majority could enable to adapt the regime dynamically. This division of instruments could be also considered at the moment when such technical regulations of space resources activities will be needed.

Third, the system of recording frequency assignments and orbital positions in an international registry, after a procedure of advanced notification and international coordination, could serve as an example for recording of procedural priority rights of space resources operators. Also, the method of prevention and avoidance of harmful interference with radio transmissions could be transposed into the future international regime of space activities. This would require the existence of an international body “mediating” between the States of different jurisdictions in cases when they were not capable to deal with the harmful interference on the bilateral basis. Additionally, the provision of the ITU allowing to cancel a registered right in “hard” cases of harmful interference could be an additional tool for enforcing the regime.