Post-Deployment Regulation for Satellite Constellations: What New Rules Will WRC-23 Adopt?

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Abstract

The general trend towards increasing interest in the use of non-geostationary orbits (non-GSO) is gaining momentum. Global non-GSO systems are being launched in batches of satellites, and some already serve dozens of countries. The International Telecommunication Union (ITU) strives to keep pace with the fast development of technologies and ensure regulatory clarity in the use of radio frequencies and associated orbits, which are limited natural resources. An important step for their rational, efficient and economical use by satellite constellations was taken at the ITU World Radiocommunication Conference (WRC) in 2019. The application of new rules for bringing into use and phased deployment of non-GSO systems has already begun, and new gaps in post-deployment regulation have been identified. This paper describes possible ways to regulate the operation of satellite constellations in a post-deployment environment, as they were developed in preparation for the 2023 WRC.

1. Introduction

The increasingly obvious trend towards more interest in the use of non-geostationary orbits (non-GSO) for various satellite services is clearly gaining momentum never seen before. The total number of satellite networks has reached almost five thousand and more than a third of them are non-geostationary.[1] Over the past five years, the number of geostationary networks fluctuated at the level of thirty-three to thirty-four hundred, and showed some decline by the end of 2022. During the same period, the number of non-GSO networks has more than doubled, from 890 in 2017 to 1817 in 2022. Non-GSO networks are increasing not only in number, but also geographically. Of 107 countries that have ever filed satellite networks, 91 countries have non-GSO filings for potential deployment of satellite systems.

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1 ITU Radiocommunication Bureau (BR) 2022 Annual Space Services Report to the STSC 2023 Session on the use of the Geostationary-Satellite Orbit (GSO) and other orbits, 31 January 2023, https://www.itu.int/en/ITU-R/space/snl/Pages/reportSTS.aspx.

Such systems are known to include multiple orbital planes with batches of satellites flying over them. The total number of satellites in multi-satellite systems varies. Of all non-GSO network filings as of the end of 2022, 122 are designed to deploy more than 100 satellites each, each of another 122 involves more than 1,000 satellites, and 21 plan to have more than 10,000 satellites in simultaneous operation. More than 80% of these systems are intended to be launched at altitudes up to 2,000 km. This means that low earth orbits will become more and more crowded, and their sustainable use requires an appropriate regulatory regime.

The regulation of the use of radio frequencies and associated orbits by multi-satellite non-GSO systems is a challenge for the International Telecommunication Union (ITU), which is the United Nations specialized agency for information and communication technologies. Time-tested provisions of the ITU Radio Regulations[2] apply to geostationary systems, which consist of a single satellite permanently occupying a single orbital slot, and are not always applicable, or applied efficiently, to constellations of satellites. This is because the use of the geostationary orbit (GSO), which has traditionally hosted the largest number of communication and broadcasting satellites, has well-developed detailed regulations proven through decades of practical application, while regulations of non-GSO became particularly relevant much more recently.

The ITU World Radiocommunication Conference (WRC) in 2019 took a significant step towards eliminating regulatory ambiguity. It resulted in a clarification in the ITU Radio Regulations regarding bringing into use frequency assignments[3] to satellites operated within non-GSO systems. Bringing into use is an important stage in every satellite project that marks its transition from paper into real life. To do so, a non-GSO system, whether consisting of a handful or many satellites, must start operating any first satellite in one of the notified orbital planes, which is capable of transmitting or receiving signals with the technical parameters corresponding to the filing (depending on the type of satellite service, there may be a 90-day minimum mandatory continuous operation period for such first satellite).[4] In order to ensure that the orbit and frequency resources of the entire system, formally brought into use by a single satellite, practically do not stand idle, WRC-19 adopted a new resolution. That is Resolution 35 (WRC-19) "A milestone-based approach for the implementation of frequency assignments to space stations in a non-geostationary-satellite system in specific frequency bands and services".

2 Radio Regulations, Edition of 2020, https://www.itu.int/pub/R-REG-RR-2020.

3 Radio Regulations, No. 1.18: "assignment (of a radio frequency or radio frequency channel): authorization given by an administration for a radio station to use a radio frequency or radio frequency channel under specified conditions".

4 Radio Regulations, Nos. 11.44C, 11.44D.

Resolution 35 (WRC-19) obliges operators to deploy in orbit a specific percentage of the total number of satellites in the non-GSO system by the three milestones. 10%, 50% and 100% of the entire number of satellites in the system are to be deployed within two, five and seven years, respectively, after the system has been brought into use by its very first satellite.[5] This milestone-based approach is aimed at ensuring reasonable correspondence between the real number of deployed satellites and the number of satellites recorded in the Master International Frequency Register (MIFR). The significance of this register lies in the international recognition of frequency assignments listed in it and their protection from harmful interference from other satellites. International rights and obligations of administrations in respect of their own frequency assignments and other administrations' frequency assignments are derived from the recording of those assignments in MIFR.[6] It is thus important to ensure that the content of the MIFR closely aligns with, and protects, what is actually in space. This is particularly relevant for large and very large constellations of non-GSO satellites which use a large and a very large number of frequencies.

Four of 27 non-GSO satellite networks, which have been brought into use, have completed deployment in accordance with Resolution 35 (WRC-19) by May 2023.[7] These are the HIBLEO-2FL and HIBLEO-2FL2 networks filed by the Administration of the United States of America and designed to be used by at least 66 satellites of the Iridium system; USCSID-P, a smaller satellite network also filed by the Administration of the USA and tasked for simultaneous operation of 8 satellites; and the QZSS-1 network filed by the Administration of Japan, which is designed to support operations of a regional time synchronization system named the Quasi-Zenith Satellite System.[8] Other non-GSO satellite networks, including much-discussed Starlink and OneWeb, have yet to complete their phased deployment.

5 Radio Regulations, Resolution 35 (WRC-19) "A milestone-based approach for the implementation of frequency assignments to space stations in a non-geostationary-satellite system in specific frequency bands and services", resolves 7, 8 and 11.

6 Radio Regulations, No. 8.1.

7 Report of the Director of the Radiocommunication Bureau to the 93rd meeting of the Radio Regulations Board (Geneva, 26 June – 4 July 2023), Revision 1 to Document RRB23-2/13-E, 9 June 2023, Section 7 "Implementation of Resolution 35 (WRC-19)".

8 ITU Constitution, Annex "Definition of Certain Terms Used in this Constitution, the Convention and the Administrative Regulations of the International Telecommunication Union", No. 1002: "Administration: Any governmental department or service responsible for discharging the obligations undertaken in the Constitution of the International Telecommunication Union, in the Convention of the International Telecommunication Union and in the Administrative Regulations"; see also Radio Regulations, No. 1.2, which contains the same definition.

2. Operation of Satellite Constellations in a Post-Milestone Environment

The early years of the new rules for bringing into use and phasing out of non-GSO systems drew attention to the still existing regulatory gaps in the post-deployment period. One of the issues raised but not resolved in Resolution 35 (WRC-19) relates to the case where a non-GSO system has completed the milestone process, has begun full-scale operations in space, has operated successfully for some time, and then experiences an intermediate- or long-term reduction of the number of deployed satellites below the number of satellites specified in the Master Register. This may result from a great variety of valid operational reasons, including in-orbit satellite failures that cause a loss of the transmitting and receiving capabilities, or natural orbital decay or voluntary relocation of satellites, which make it impossible to fully support utilization of the frequency assignment. In each of these cases, actual operating parameters of the non-GSO system would no longer correspond to those entered in the MIFR. At the same time, the requirement that the number of satellites deployed and capable of transmitting or receiving a recorded frequency assignment correspond to the number of satellites in the recorded frequency assignment remains for as long as they are recorded in the MIFR. Whenever it appears that a recorded assignment is used not in accordance with the notified characteristics, the ITU Radiocommunication Bureau may request clarifications and, in case incompliance is not refuted, the Bureau may suitably modify the frequency assignments.[9]

On the one hand, operators must be given reasonable time to replenish systems, which should take into account the time to launch and possibly produce the missing number of satellites. On the other hand, restoring the original system must be a firm obligation of operators so that consistency is maintained between the recorded orbital parameters of non-GSO systems and those of the systems actually deployed. If constellations remain on paper and not in space, valuable orbit and frequency resources may become "frozen". An adequate post-milestone regulatory framework is needed to balance the interests of all users of this limited natural resource and ensure its rational, efficient, and economical use.

2.1. Applicability of the Suspension Procedure to Non-GSO Systems

In case in-orbit operational mishaps result in a total loss of the frequency use, the notifying administration which is responsible for the relevant frequency assignment has six months to request a formal suspension of that recorded frequency assignment. Three years from the onset of the suspension event are allowed for bringing back the frequency assignment into use, otherwise the recorded assignment will be removed from the MIFR.[10] If an administration fails to comply with the six-month notice period, the three-year period for

9 Radio Regulations, No. 13.6.
10 Radio Regulations, No. 11.49.

bringing back into use is proportionately reduced. Administrations usually resort to a suspension procedure timely and apply appropriate measures to resolve operational problems. If an administration does not formally suspend the use of an unused frequency assignment, such assignment may be cancelled by the Radiocommunication Bureau due to its non-compliance with the recorded characteristics after completion of the investigation.[11]

The suspension procedure does not cover the situation where some of the satellites in the non-GSO system do not use a frequency assignment in accordance with its registered characteristics. For example, this is the case where a frequency assignment to a non-GSO system continues to be used, but the number of satellites capable of using this assignment is less than the number of satellites recorded in the Master Register. This case cannot be addressed by suspending the use of the recorded frequency assignment as long as it continues to be used in accordance with the recorded characteristics on at least one satellite in the constellation. If the number of satellites in a non-GSO system drops to zero, then the use of frequencies is completely ceased and the suspension procedure may be resorted to. If this does not happen, the use of the frequencies is not ceased and the suspension procedure is not available.

At the same time, when the number of satellites in a constellation falls below the notified number, there is a discrepancy between the actual technical parameters of the constellation and the constellation information in the Master Register. In case of discrepancy, the ITU Radiocommunication Bureau may request clarifications from the responsible notifying administration and then reduce the number of satellites in the MIFR in order to reflect the current number of satellites deployed. This may lead to undesirable consequences, such as instant reduction in the recorded number of satellites in the constellation, even if the mismatch between the number of satellites deployed and the number of satellites specified in the MIFR is minor or short-term.

2.2. Studying the Topic

WRC-19 found it useful to consider an adapted regulatory mechanism to be invoked by notifying administrations when recorded frequency assignments were not used in accordance with the recorded characteristics on some but not all satellites of the non-GSO system. The ITU Radiocommunication Sector (ITU-R) was invited to study, as a matter of urgency, possible development of an appropriate post-milestone procedure.

11 Radio Regulations, No. 13.6: "whenever it appears from reliable information available that a recorded assignment … is no longer in use, or continues to be in use but not in accordance with the notified required characteristics …, the Bureau shall consult the notifying administration and request clarification as to whether the assignment … continues to be in use in accordance with the notified characteristics".

To facilitate such research and provide information for studying the topic, Resolution 35 (WRC-19) required notifying administrations to inform the Radiocommunication Bureau of the date when the number of satellites deployed and capable of transmitting or receiving the recorded frequency assignments fell below a specified threshold.[12] This threshold was set at 95% of the total number of satellites in the constellation, rounded down to the nearest whole number, minus one satellite. The Resolution did not require reporting as long as the number remained below the threshold for no more than six months, based on the understanding that short-term changes in non-GSO systems are normal. Notifying administrations were also requested to inform the Bureau of the date on which the deployment of the total number of satellites was resumed.

Preparatory studies of the technical, operational and procedural matters to be considered by World Radiocommunication Conferences are carried out by the ITU-R Study Groups, which bring together more than 5,000 experts from administrations, industry and academia all over the world. In particular, Study Group 4 (SG 4) is in charge of satellite services. Its Working Party 4A (WP 4A) deals directly with a range of issues related to the efficient orbit and spectrum utilization.

During the full four-year study cycle, from WRC-19 to WRC-23, WP 4A discussed possible rules to apply when a non-GSO system subject to the milestone procedure in Resolution 35 (WRC-19) completed the milestone procedure and then experienced a sustained reduction in the number of satellites deployed and capable of transmitting or receiving the assigned frequencies.

On the basis of contributions from the ITU membership and inputs from the ITU-R Study Groups, the Conference Preparatory Meeting (CPM) drafted and approved a report to be considered by the World Radiocommunication Conference in 2023. The CPM Report aims to assist those who are involved in the preparations for and deliberations at WRC-23, including its Agenda Item 7 which addresses "Topic B – Non-GSO bringing into use post-milestone procedure".

3. Two Methods to Address the Topic

As a result of ITU-R studies, two methods to address Agenda Item 7(B) have been developed and included in the CPM Report.[13]

12 Radio Regulations, Resolution 35 (WRC-19) "A milestone-based approach for the implementation of frequency assignments to space stations in a non-geostationary-satellite system in specific frequency bands and services", resolves 19.

13 Report of the CPM on technical, operational and regulatory/procedural matters to be considered by the World Radiocommunication Conference 2023, 4/7/2 Topic B – Non-GSO bringing into use post-milestone procedure, pp. 821-830, https://www.itu.int/md/R19-CPM23.2-R-0001/en.

3.1. Making No Changes to the Radio Regulations

The first method, Method B1, is to make no further changes to the ITU Radio Regulations. In this case, it is still possible to rely on the existing regulatory mechanisms once the milestone process is completed.

This means that the reasonable correspondence between the number of satellites in a non-GSO system and the number of satellites recorded in the MIFR will continue to be ensured by the suspension procedure available to non-GSO systems in case the total number of satellites deployed counts to zero. In case the number of satellites is less than those recorded but above zero, then a modification of the recording may be requested by the Radiocommunication Bureau so that the real number of satellites equals to the one in the MIFR.

Whether it is overly strict or not, making no changes, which is referred to as "NOC" in the WRC documents, is always available among the possible options.

3.2. Modifying the Radio Regulations

The other method, Method B2, was developed to enhance the existing procedure for suspension of frequency assignments to satellite constellations. This requires a balance to be struck between some operational flexibility in maintaining non-GSO systems and continuously keeping reasonable consistency of the number of capable satellites deployed for the system with the number of notified satellites recorded in the MIFR.

Method B2 involves the adoption by the World Radiocommunication Conference of a new Resolution and the modification of Article 11 of the ITU Radio Regulations "Notification and recording of frequency assignments" by referring to such new Resolution. In the WRC documents, methods involving modifications are referred to as "MOD".

3.2.1. Draft New Resolution

The draft new Resolution contains a regulatory mechanism by which an obligation to operate frequency assignments to non-GSO systems in accordance with their notified characteristics could be waived for a limited period of time, or indefinitely if the discrepancy is insignificant. If adopted, this Resolution would be applicable to those frequency assignments which are subject to Resolution 35 (WRC-19) on a milestone-based implementation of non-GSO systems. These are most commercially attractive frequencies in the fixed-satellite, mobile-satellite and broadcasting-satellite services. Only those constellations which operate with apogee altitudes lower than 15,000 km would be subject to this new Resolution. This is explained by the need to provide more detailed regulation for the most demanded and crowded low earth orbits.

In the event that the number of satellites deployed in the notified orbital planes and capable of transmitting or receiving recorded frequency

assignments falls below a specific threshold and remains below that threshold for a continuous six-month period, the notifying administration is required to inform the Radiocommunication Bureau of the start date of such period. Not later than three years from the start date of the discrepancy period, the number of satellites deployed on the notified orbital planes and capable of transmitting or receiving recorded assignments must again reach the threshold. The maximum available period of three years is given on the condition that the notifying administration has actually informed the Bureau of the start of the discrepancy period within six months. If the notifying administration informs the Bureau more than six months after the start date of the discrepancy period, the three-year period to restore the constellation is reduced by the period of delay in reporting. For example, if the notifying administration informs the Bureau that the number of actually operating satellites has fallen below the threshold after one year and a half, instead of after six months as maximum, then this administration would have to reach again the threshold after two years, not three years (the difference between the regulatory term of six months and the actual notice period of one year and a half used in this example is one year, which means that the difference between the regulatory three-year period to replenish the constellation and the period actually given to do so, which would take into account the delay, will also be one year; three years minus one "penalty" year gives the administration two years in total to restore its constellation to the threshold value). This provides an incentive for timely reporting to ensure that the MIFR data are consistent with the reality in orbits.

As soon as the number of satellites deployed on the notified orbital planes and capable of transmitting or receiving recorded frequency assignments reaches the threshold, the notifying administrations must so inform the Bureau. If after the three-year period (or a shortened period which serves as a penalty for late notification) the number of satellites is still below the threshold, the notifying administration must submit to the Bureau modifications to the characteristics of the notified or recorded frequency assignments to reduce the total number of satellites indicated in the Master Register. If the notifying administration does not provide the required information, its frequency assignments will no longer be protected from harmful interference from other frequency assignments recorded in the Master Register and must not cause harmful interference to such other assignments.

3.2.2. Setting the Threshold

When setting a specific threshold, the following considerations should be kept in mind.

First, typical changes in the number of satellites deployed and capable of transmitting or receiving recorded frequency assignments should be taken into account in order to avoid reporting minor changes. WP 4A discussed a

5-10% permissible deviation in the number of satellites, which would not entail obligations to inform the Bureau and restore the full operation of the constellation. Secondly, the question is whether the same threshold would be applied to all constellations, regardless of their size.

In non-GSO systems with a small number of satellites, each satellite makes up a higher percentage than in a large non-GSO system. For example, in a system of ten satellites, one satellite represents 10% of the system. The same 10% in a system of 1,000 satellites is one hundred satellites. Applying the same 10% threshold would require reporting a discrepancy of only one satellite in a small system, while allowing a deviation of 99 satellites with no consequences in a larger system. This would seem unreasonable, since the consequences of losing a single satellite are more significant in smaller systems as it causes quite a high percentage of degradation and is more likely to bring the number of deployed satellites below the threshold. The failure of a number of satellites in a large system, in turn, leads to a slight degradation of the total number of operating satellites and may not even cross the threshold. No consensus has been reached yet on whether the same or different approaches should be applied to small and large non-GSO systems.

Method B2 thus contains two options for applying the new Resolution. The first option, Option B2a, involves the same percentage of the system's satellites, without regard to the number of satellites in the non-GSO system. The draft Resolution proposes a threshold value of 95%. The second option, Option B2b, proposes to apply different thresholds for the number of satellites capable of receiving or transmitting frequency assignments as a percentage of the total number of satellites of a non-GSO system depending on its size. The draft Resolution contains several alternative options for dividing non-GSO systems by size, suggesting two to five size groups.

For example, splitting into five size groups suggests distinguishing between small constellations consisting of less than 50 satellites, moderate constellations from 50 to 99 satellites, medium constellations of 100 or more but less than 550 satellites, large constellations from 550 satellites but less than 5,000 satellites and very large constellations counting 5,000 satellites and more (this size group is referred to as Alternative 4 in the CPM Report). Splitting into two size groups suggests setting different requirements for constellations depending on whether the constellation consists of 50 or more satellites or from three to fewer than 50 satellites (this size group is referred to as Alternative 1 in the CPM Report). Depending on the number of size groups, different threshold values are proposed. The general approach is to set a higher percentage of tolerance for small non-GSO systems, up to 50% of the number of satellites recorded in the Master Register. The more satellites in the system, the lower the tolerance percentage, down to as little as 5% of the recorded number of satellites. The constellation size groups and thresholds have been developed based on the analysis of already notified non-GSO constellations, but these are merely suggestions for discussion at WRC-23.

4. Expectations from WRC-23

When analyzing possible outcomes of WRC-23, positions of both ITU member countries and satellite operators are worth considering. In advancing their agenda at conferences, administrations tend to listen to the needs of business, which is the backbone of the industry and a major taxpayer.

4.1. Voice of the Industry

A unified voice of the satellite industry is provided by the Global Satellite Operators' Association (GSOA). GSOA is an ITU-R Sector member and presented its consolidated position on a number of agenda items of WRC-23,[14] but not on Agenda Item 7(B). The GSOA members failed to come to a consensus on this issue. Differing positions between GSO and non-GSO operators are quite common, but interestingly no agreement could be reached among non-GSO operators on the rules applicable to all of them.

Some operators argue that they have just begun to provide information on the phased deployment of their constellations in accordance with the milestones specified in Resolution 35 (WRC-19). According to the deployment schedule and the deadlines set by this Resolution, the very first of the new non-GSO systems will complete all milestones in 2028. Accordingly, between 2023 and 2027, when the next two WRCs take place, it might be reasonable to gain experience with the phased approach before determining how the post-milestone regulation will be handled. Therefore, these operators consider it premature to provide a detailed method describing what happens after the milestones at this stage, at WRC-23. They support collecting experience on the application of Resolution 35 in the next ITU-R study cycle, that is from 2023 to 2027, and considering the post-milestone regime on a later stage, perhaps at WRC-27.

Other operators do not see how extra time to gain more experience with the milestones would help better define the procedure after the milestones. They argue for the need for regulatory clarity through a decision at WRC-23. This would allow each operator to pre-determine their launch strategies after going through all three milestones and not get stuck in a grey area with no clear rules until WRC-27.

4.2. Positions of Regional Telecommunication Organizations

Of great importance in the work of ITU, which consists of 193 countries, are six regional telecommunication organizations. These are Asia-Pacific Telecommunity (APT), African Telecommunications Union (ATU), European Conference of Postal and Telecommunications Administrations (CEPT), League of Arab States (LAS; in the field of spectrum management, Arab States collaborate and express their common position through the Arab

14 Global Satellite Operator's Association, WRC-23 Positions, https://gsoasatellite.com/WRC23/.

Spectrum Management Group, ASMG), Inter-American Telecommunication Commission (CITEL) and Regional Commonwealth in the Field of Communications (RCC). They hold discussions at the regional level, allowing the development of consolidated positions for groups of countries. Agreed regional positions are put on the table of the World Radiocommunication Conferences and make it easier to agree on issues at the global level. A good opportunity to exchange formally and informally and have a better understanding of the draft common views, positions and proposals of regional organizations is provided by the ITU Inter-regional Workshops. The 3rd ITU Inter-regional Workshop on WRC-23 preparation took place from 27 to 29 September 2023. The study of the positions of regional telecommunication organizations on the WRC-23 agenda items makes it possible to predict, with some accuracy, the main vectors of discussions.

According to the RCC position on agenda items for WRC-23,[15] RCC administrations believe that some reduction in the number of satellites deployed, representing a certain percentage of the total number of satellites registered in the MIFR, should be allowed. This percentage should depend on the total number of satellites in the constellation. RCC administrations also support the development of a new Resolution regarding the post-milestone procedure for systems using orbits with the apogee altitude lower than 15,000 km and stress the need to take into account operational features of non-GSO systems with a small number of satellites. The votes of RCC administrations are hence cast for Method B2b, with preference for the most detailed size group presented in the CPM Report (Alternative 4).

ASMG administrations[16] also argue against applying a fixed percentage to initiate regulatory procedures because it does not take into account the variation in the number of satellites in satellite systems. They propose dividing such systems into three size groups, specifically from two to less than 50, from 50 to less than 500, and from 500 satellites, and applying different threshold values to these three size groups, with 95% being the highest threshold value for the largest size group.

CEPT administrations[17] also cast their votes for Method B2b. They support adoption of a new Resolution which would regulate the post milestone procedures for non-GSO constellations and allow for some operational flexibilities. Such Resolution, according to CEPT, should be adopted at WRC-23 to give administrations a more stable regulatory framework to adapt their launch strategies to these new rules after the third milestone, which will take place mainly from 2027 onwards. CEPT administrations propose different thresholds for smaller constellations with less than or equal to 50 satellites, and larger constellations with more than 50 satellites (of the

15 Document WRC-23-IRW-23/3-E, 19 September 2023, p. 12-13.
16 Document WRC-23-IRW-23/9-E, 26 September 2023, p. 24.
17 Document WRC-23-IRW-23/8-E, 26 September 2023, p. 46-47.

four alternatives presented in the CPM Report, this proposal is closest to Alternative 1). For larger constellations, CEPT argues for a possibility to operate a minimum 95% of the number of satellites notified in the MIFR without regulatory impact. For smaller constellations with less than or equal to 50 satellites, CEPT supports a threshold below 95% without proposing a specific figure.

APT also supports Method B2 with preference for Option B2b,[18] while an appropriate set of equations applicable to different constellation sizes, according to APT, needs to be further discussed. APT Members are of the view that when developing the post-milestone procedures, overregulation needs to be avoided and some degree of operational flexibility which is necessary for the maintenance of the non-GSO system in the FSS, BSS and MSS, may need to be duly considered.

ATU administrations have not made their choice on the post-milestone reporting procedure for non-GSO systems.[19] They continue considering both methods, Method B1 and Method B2, with the aim of convening further meetings and developing an African common positions and proposals.

CITEL supports no changes to the ITU Radio Regulations, which corresponds to Method B1.[20] CITEL considers that the information-gathering should continue until such time when sufficient and meaningful operational data are collected before revisiting the question of a potential post-milestone mechanism to address intermediate- and long-term reductions in the number of space stations in non-GSO systems that have completed the milestone process.

Thus, the MOD method, which promises to introduce changes to the current ITU regime in the form of a new Resolution and the addition of a reference to it in Article 11 of the Radio Regulations titled "Notification and recording of frequency assignments", seems to be the most widely supported by administrations across countries and continents. This suggests that Method B2 will form the basis of major discussions at WRC-23.

5. Conclusions

The new regulatory mechanism under the draft Resolution would be applicable, if adopted, in addition to the already existing suspension procedure, not instead of it. In other words, if the number of operating satellites in the non-GSO system becomes zero and the frequency assignments cease to be used, then the notifying administration could still resort to the procedure for suspension of the use of the frequency assignment. It will have the same period of three years (if not reduced as a penalty for delayed

18 Document WRC-23-IRW-23/6-E, 20 September 2023, p. 45.
19 Document WRC-23-IRW-23/1-E, 8 September 2023, p. 24.
20 Document WRC-23-IRW-23/7-E, 27 September 2023, p. 27.

notification) for the re-commissioning of the frequency assignment. The new Resolution would only apply when the number of satellites in a non-GSO system is above zero but below a specified threshold. Any discrepancy between the actual and registered number of satellites would not threaten an immediate modification of the Master Register data, but would give a period of time to eliminate such a discrepancy.

Thus, in fact, it is in the interests of the operators to have such a new Resolution. It so often happens that what is in the interests of operators, is in the interests of their end users and, ultimately, in the interests of regulators too.

The last word rests with WRC-23 which will consider the use of orbit and frequency resources by non-GSO systems in a post-milestone environment and decide on the regulatory framework which must ensure the rational, efficient and economical use of such limited natural resources of outer space, at least for the next four years.