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Arbitration as the Dispute Settlement Method to Address Harmful Interference in the Age of Mega-Constellations of Satellites

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Abstract

The increasing demand for radio frequency spectrum usage for the launch of mega-constellations of telecommunication satellites will potentially increase incidents of harmful interference to radiocommunication. International law has yet to regulate a compulsory method of dispute settlement for harmful interference disputes. Currently, most cases of harmful interference are solved through technical and political means. However, those methods cannot address damage claims that may be caused by harmful interference, which may become increasingly common with the growing participation of private entities. Article 56 of the ITU Constitution has regulated several dispute resolution methods related to telecommunications, namely negotiation, diplomatic channels, other methods mutually agreed upon by the parties, and arbitration. This study aims to analyze these methods of dispute settlement and determine the most appropriate method to address harmful interference disputes. As the diplomatic dispute settlement methods do not result in enforceable legally binding decisions, this study argues that arbitration is the most appropriate method to settle disputes concerning harmful interference because it offers more neutrality in its proceedings and the confidentiality of sensitive information. It may also decide on damages as part of the arbitral award. Arbitration awards are final and binding, thus offering legal certainty to the parties to the dispute. States have generally recognized arbitration awards and created mechanisms to enforce arbitral awards. This study also recommends that the ITU implement compulsory arbitration with limitations and create a harm-claim threshold.

Keywords: arbitration; dispute settlement; harmful interference; satellite constellation; telecommunication satellite

A. INTRODUCTION

In a post-coronavirus pandemic world, our society has increasingly relied on internet connectivity in our day-to-day activities.[4] This, coupled with the advancement of technology, has led to some ambitious plans by many private companies to launch a mega-constellation of telecommunication satellites to provide internet services worldwide.[5] This rapid expansion in radio frequency spectrum usage may present a problem in the near future, as each satellite in a constellation requires a radio frequency spectrum to communicate with each other to provide telecommunication services.[6] With the rise of mega-constellations of communication satellites, the demand for radio frequency spectrums is also rising. This increasing

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[4] Kostas Mouratidisa and Apostolos Papagiannakis, "COVID-19, internet, and mobility: The rise of telework, telehealth, e-learning, and e-shopping", *Sustainable Cities and Society,* Vol. 74, 2021, at 9.
[5] Sissi Cao, "From Boeing to Astra, the Space Industry Is Vying to Challenge Starlink's Dominance," <https://observer.com/2021/11/boeing-astra-space-startups-eye-satellite-constellation-compete-starlink/>, accessed on 29 May 2022.
[6] Audrey L. Allison, *The ITU and Managing Satellite Orbital and Spectrum Resources in the 21st Century*, Cham: Springer, 2014, at 6.

demand will potentially increase incidents of harmful interference to radiocommunication, which makes harmful interference disputes a growing issue in the telecommunication satellite industry.[7]

In public international law, telecommunication satellites are regulated through several legal regimes, including outer space law and telecommunications law. The Outer Space Treaty of 1967 is one of the main legal instruments of outer space law. Article IX of the treaty only provides that States must consult in good faith if there is a potential for harmful interference. This treaty does not specify further what is considered 'harmful interference' nor provides a specific dispute settlement procedure. This treaty only addresses States, and in the event of a dispute, the primary recourse of dispute resolution is through diplomatic negotiations.[8] If diplomatic negotiations cannot resolve the dispute, general international dispute settlement mechanisms may also be utilized as general public international law applies to outer space.[9] However, international space law further specifies liability for damage caused by space objects through the Liability Convention 1972. This convention defines compensable damage as "*[…]loss of life, personal injury, or other impairment of health; or loss of or damage to property of States or persons, natural or juridical, or property of international intergovernmental organization[…]*."[10] The generally acceptable interpretation of damage stipulated in this article refers mainly to physical damage directly caused by a space object, such as a collision of satellites.[11] As such, damage caused by radio interference could not be compensated through this regime.

Harmful interference caused by radio interference is mainly regulated through the International Telecommunications Union (ITU) Regulatory Framework, consisting of three main legal instruments: the ITU Constitution, the ITU Convention, and the ITU Radio Regulations. In the ITU Radio Regulation, 'harmful interference' is defined as interference that "endangers the functions of a radio navigation service or other safety services, or seriously degrades, obstructs, or repeatedly interrupts a radiocommunication service operating under Radio Regulations."[12] The ITU recognizes that radio frequencies and any associated orbits are recognized as limited natural resources, and they must be used rationally, efficiently, and economically.[13] Thus, the ITU Convention prohibits harmful interference through Article 45 of the Convention, which stipulates that "all stations must be established and operated in such a way that will not cause harmful interference" and requires Member States of the ITU to ensure that operators under their jurisdiction, including private actors, must observe this rule.

The ITU does not have a *compulsory* international dispute settlement mechanism for harmful interference.[14] Article 56 of the ITU Constitution provides several methods of dispute settlement regarding disputes relating to the interpretation or application of the Constitution, Convention, or Administrative Regulations of the ITU. The parties may solve their dispute through negotiation, diplomatic channels, or methods mutually agreed upon by

[7] Aaron C. Boley and Michael Byers, "Satellite mega-constellations create risks in Low Earth Orbit, the atmosphere and on Earth," *Science Report*, Vol. 11, 2021, at 4.

[8] Frans G. von der Dunk, "The 'Space Side' to 'Harmful Interference'" in *Dispute Settlement in Harmful Interference* edited by Mahulena Hofmann, New York: Routledge, 2022, at 91.

[9] Article 3 of the Treaty on Principles Governing the Activities of States in the Exploration and Use of Outer Space, including the Moon and Other Celestial Bodies 1967.

[10] Article I(a) of the Convention on International Liability for Damage Caused by Space Objects 1972.

[11] Sarah M. Mountin, "The Legality and Implications of Intentional Interference with Commercial Communication Satellite Signals," *International Law Studies,* Vol. 90, 2014, at 63.

[12] Article 1.169 Section VII of the Radio Regulations of the International Telecommunications Union.

[13] Article 44(2) of the Constitution of the International Telecommunication Union.

[14] Ram S. Jakhu and Karan Singh, "Space Security and Competition for Radio Frequencies and Geostationary Slots", *Zeitschrift für Luft*, Vol. 58 No. 1, 2009, at 88.

the disputing parties.[15] Furthermore, if these methods are not adopted, the disputing Member States may refer their dispute to arbitration following the procedures in Article 41 of the ITU Convention.[16] This procedure is triggered once a Member State of the ITU sends a notice of the submission of the dispute to arbitration to the other party.[17] The parties then shall agree to entrust the arbitration to individuals, administrations, or governments.[18] Each party then shall appoint an arbitrator who then shall choose a third arbitrator,[19] Or the parties may agree to have their dispute settled by a single arbitrator.[20] The arbitrator(s) have the freedom to choose the venue and the rules of procedure that would be applied in the arbitration, and the decision of the arbitrator(s) shall be final and binding upon the parties to the dispute.[21] Some ITU Member States have additionally agreed to the Optional Protocol on the Compulsory Settlement of Disputes Relating to the Constitution of the International Telecommunication Union, to the Convention of the International Telecommunication Union, and to the Administrative Regulations (Optional Protocol), which essentially makes the arbitration procedure as stipulated in Article 41 of the ITU Convention mandatory for the settlement of disputes between States Parties of the Protocol.[22] Presently, sixty-four countries have ratified or acceded to the protocol.[23] In practice, Article 41 of the ITU Convention and the Optional Protocol have not been used.

To date, all cases of harmful interference have been resolved through the mechanisms stipulated in Article 15 of the ITU Radio Regulation.[24] This article provides that in cases of harmful interference, the disputing parties are obliged to exercise the utmost goodwill and mutual assistance in resolving the issue, which must be done exclusively through bilateral negotiations.[25] The disputing States may also request assistance from the ITU's Radiocommunication Bureau and Radio Regulatory Board, but those bodies could only recommend resolutions that are not legally binding. The dispute may also be referred to the ITU World Radiocommunication Conference (WRC),[26] To be discussed in WRC Plenary Sessions. However, the decisions made in these forums are generally based on broader political considerations, thus undermining the proper application of the regulations and the fair and efficient dispute resolution by the ITU.[27] This mechanism is also inadequate to determine reparations where damages are incurred, as it only focuses on the technical aspects of eliminating harmful interference. The ITU also has no authority to enforce its decisions legally, as they are not legally binding.

The issue of harmful interference has primarily been addressed by political and technological means, and some States have

[15] Article 56(1) of the Constitution of the International Telecommunication Union.
[16] Article 56(2) of the Constitution of the International Telecommunication Union.
[17] Article 41(1) of the Convention of the International Telecommunication Union.
[18] Article 41(2) of the Convention of the International Telecommunication Union.
[19] Article 41(5) and 41(7) of the Convention of the International Telecommunication Union.
[20] Article 41(8) of the Convention of the International Telecommunication Union.
[21] Article 41(9) and Article 41(10) of the Convention of the International Telecommunication Union.
[22] Article 1 of the Optional Protocol on the Compulsory Settlement of Disputes Relating to the Constitution of the International Telecommunication Union, to the Convention of the International Telecommunication Union, and to the Administrative Regulations.
[23] International Telecommunication Union, List of Countries having ratified, accepted, approved (or acceded to) the Optional Protocol on the Compulsory Settlement of Disputes relating to the Constitution, to the Convention and to the Administrative Regulations (Geneva, 1992), <https://www.itu.int/online/mm/scripts/gensel25?agrmtid=0000925245>, accessed on 1 Mei 2023.
[24] Ram S. Jakhu, "Regulatory Processes for Communications Satellite Radio Frequencies" in *The Handbook of Satellite Applications*, 2nd Edition edited by Joseph N. Pelton, et al. (eds.), New York: Springer Science & Business Media, 2017, at 378.
[25] *Ibid.*, at 379.
[26] Article 14(2)a of the Constitution of the International Telecommunication Union.
[27] Ram S. Jakhu, "Dispute Resolution under the ITU Agreements," <https://swfound.org/media/48115/jakhu-dispute%20resolution%20under%20the%20itu%20agreements.pdf>, accessed on 27 April 2023, at 5.

also begun to strengthen their national regulations.[28] However, these efforts have yet to resolve this issue effectively. States responsible for stopping interference within their borders often fail to comply with their international obligations by not taking action to eliminate unlawful interference originating from within their borders.[29] For example, Eutelsat SA has alleged that the Iranian government jammed two of its satellites in 2022 in the wake of widespread protests in Iran.[30] The ITU has yet to address this issue, and the ITU does not have the mechanism or authority to enforce or impose sanctions on State Parties who violate ITU provisions.

Considering the rise of private actors in the industry and the limited authority of the ITU to legally enforce the recommendations given to the parties to the dispute, the current regulations may not be enough to face the rapid expansion of the telecommunication satellite industry and the problems it entails. This article aims to highlight arbitration as the best method of dispute settlement concerning harmful interference as it provides a final and legally binding outcome, and many States have developed their national regulations to enforce arbitral awards. The first part of this article will examine the scope of harmful interference disputes, the parties that may be involved in the dispute, and the issue of harm-claim threshold in harmful interference. The second part of this article will analyze the limitations of diplomatic settlement of disputes, specifically the lack of dispute settlement provisions in the agreement between parties, the regional practice of good offices, and the power imbalance in negotiation and diplomatic channels as dispute settlement. Considering the current development, these methods may not adequately address the issue. The fourth part of this article will analyze the method of arbitration, examine its positive and negative characteristics, and ultimately argue that arbitration would be the most appropriate method to address harmful interference disputes. The fifth part of this article will analyze the need for compulsory arbitration while looking at the compulsory arbitration provision of the United Nations Convention on the Law of the Sea (UNCLOS) as guidance. The last part of this article will provide the conclusion and suggestions on the main issue of this article.

B. DEFINING 'HARMFUL INTERFERENCE DISPUTE'

A dispute may be defined as: "*specific disagreement concerning a matter of fact, law or policy in which a claim or assertion of one party is met with refusal, counter-claim or denial by another*."[31] As mentioned in the previous part, harmful interference is defined as "endangers the functions of a radio navigation service or other safety services, or seriously degrades, obstructs, or repeatedly interrupts a radiocommunication service operating under Radio Regulations."[32] This definition has been widely accepted and integrated into national laws by ITU Member States.[33] Some States have further specified that radio communication spectrum operating in accordance with their national laws are also protected from harmful interference.[34]

The present ITU definition of interference does not explicitly distinguish the 'intentional' or 'unintentional' nature of the interference.[35] 'Unintentional interference' is primarily caused by human error or non-compliance to regulatory requirements and industry standards, which are the main cause

[28] Ram S. Jakhu and Karan Singh, *supra* note 10 at 83-85.
[29] Sarah M. Mountin, *supra* note 8 at 5.
[30] Jason Rainbow, "Eutelsat says satellite jammers within Iran are disrupting foreign channels," <https://spacenews.com/eutelsat-says-satellite-jammers-within-iran-are-disrupting-foreign-channels/>, accessed on 10 July 2023.
[31] J.G. Merrills, *International Dispute Settlement*, 4th Edition, New York: Cambridge University Press, 2005, at 1.
[32] Article 1.169 Section VII of the Radio Regulations of the International Telecommunications Union.
[33] Article 2(20) of the Directive (EU) 2018/1972; Article 2(r) of the Directive 2014/53/EU; Article 3(m) Part 15 Title 47 of the United States Code.
[34] Article 2(20) of the Directive (EU) 2018/1972; Article 3(m) Part 15 Title 47 of the United States Code.
[35] The ITU prohibits jamming through Article 15.1 Section VII of the Radio Regulations of the International Telecommunications Union.

of interference in communication satellites. Unintentional interference is solved primarily through notification and coordination with the operators and does not usually cause serious international controversies.[36] Conversely, 'intentional interference' refers to the deliberate attempt to overpower or jam transmissions. This type of interference is significantly less common but important to distinguish.[37] However, some States have defined them in their national satellite telecommunications law.[38] With the advancement of technology and the increasing technical capabilities of both State and private actors that may cause harm by way of committing intentional harmful interference, these terms might be essential to be legally defined in the future to assure legal certainty and consider claims of damages caused by harmful interference.

In harmful interference disputes, the parties involved may be States or private parties. States in this context may refer to States where the satellite is registered and/or the radio frequency spectrum is allocated. Private parties in this context usually refer to private companies as the operator of the satellite and/or the operator that has been granted a license to use the radio frequency spectrum. Because radio frequencies are recognized as a limited resource, the ITU is mandated to coordinate international efforts to eliminate harmful interference between radio stations of various States.[39] The ITU is responsible for allocating bands of the radio-frequency spectrum to services, the allotment of radio frequencies to areas or countries, and the registration of radio-frequency assignments to stations internationally.[40] On a national level, a party that wants to utilize the radio frequency spectrum must follow the procedure as set by its national regulation. Proper filing is crucial in determining *who* has the right to be protected from harmful interference, as many national regulations and the ITU regulatory framework limit harmful interference protection to those that operate under the ITU Radio Regulation or its national laws. For example, the European Union, through Article 2(20) of Directive (EU) 2018/1972 states that radio communication services operating in 'applicable international, Union or national regulations' are protected from harmful interference.

The subject matter of the dispute may be harmful interference that occurs to a lawful usage of the radio frequency spectrum. In examining harmful interference disputes related to telecommunication satellites, harmful interference may cause damages to the operator, as it disrupts their service from being performed. Thus, a harmful interference dispute may also involve claims of damages caused by the harmful interference. To date, there is no specific provision concerning damages claims caused by harmful interference. As mentioned above, the ITU, through Article 15 of the ITU Radio Regulations, only solves the harmful interference itself and is unable to address the subsequent damage that was caused by the harmful interference. Therefore, while this procedure is competent to end the harmful interference, there is a need to choose other methods of settlement of the dispute to address issues of damage claims should it arise.

It is important to note, however, that currently, there is no specific threshold to claim harmful interference has occurred. The United States, through its governmental telecommunications agency, the Federal Communication Commission's Technical Advisory Council, has produced a white paper concerning interference limits policy called 'harm-claim threshold,' which specifies the level of radio interference that receivers

[36] Ram Jakhu, "Satellites: Unintentional and Intentional Interference", <https://swfound.org/media/108687/jakhu-satellite%20interference%20and%20space%20sustainability%20(17jun13).pdf>, accessed on 23 June 2023, at 3.

[37] Gerry Oberst, "European Law as an Instrument for Avoiding Harmful Interference" in *Dispute Settlement in Harmful Interference* edited by Mahulena Hofmann, New York: Routledge, 2022, at 127.

[38] The United States prohibits 'willful interference' in Article 333 Part I Title 47 of the United States Code.

[39] Article 1(2) of the Constitution of the International Telecommunications Union.

[40] Article 5.1 of the Radio Regulations of the International Telecommunications Union.

should be expected to tolerate before an operator can claim harmful interference to the regulatory body.[41] The TAC white paper describes the interference limit policy in detail, although it specifies that this limit would only serve as a general threshold condition for harmful interference claims and is not intended to capture specific situations, as results of harmful interference widely vary.[42] This limit would be defined over a service's assigned frequency range and some range outside of the assigned frequencies to provide more clarity of the entitlement that comes with a frequency assignment and recommend that services make their own system design decisions following the limits.[43] However, this policy has not been adopted by any regulatory body in the US, mainly because of concerns related to economic costs.[44] Since the number of satellite launches keeps increasing, this threshold may become increasingly important to determine and implement in the future to prevent overwhelming claims of harmful interference incidents and encourage manufacturers and operators to improve their systems to prevent harmful interference from happening.

Article 56 of the ITU Constitution has provided several non-judicial dispute settlement methods, which will be discussed below. Some considerations must be noted while choosing the most appropriate method of dispute settlement concerning harmful interference disputes. Firstly, harmful interference disputes may involve industry-sensitive information, scientific know-how, and detailed technical data.[45] This creates a need for confidentiality in the dispute settlement process. Secondly, the method should be able to address damage claims and provide a mechanism to enforce the outcome of the settlement. However, if most of the disputes are settled in confidence, it may hinder the legal studies needed to develop the legal regime surrounding this issue. As the telecommunication satellite industry is rapidly growing, it is crucial to conduct legal studies to address the legal problems it faces or may face in the future. It would also assist States in developing the legal regime to maintain order and govern their nationals in conducting space telecommunications activities.

C. LIMITATIONS OF DIPLOMATIC DISPUTE SETTLEMENT METHODS

1. Lack of Provisions Concerning Dispute Settlement Method in Coordination Agreements

Article 56(1) of the ITU Convention states that disputing parties may solve their disputes through procedures established by bilateral or multilateral treaties concluded between them for the settlement of international disputes or by any other method mutually agreed upon. In the case of harmful interference, the 'treaties' stipulated in this article may refer to coordination agreements. A coordination agreement is the result of a spectrum coordination process between stakeholders. [46] The parties involved must abide by this agreement, as an infringement of these agreements might result in harmful interference that would disrupt the satellites' services and consequently cause damage to satellite operators.[47] However, in practice, coordination agreement between States is primarily technical as its provisions

[41] William W. Sharkey and Mark M. Bykowsky, "Can Market Forces and an Interference Limit Together Promote the Efficient Co-existence of Radio Systems?" *FCC Office of Economic Analysis*, 16 April 2020, at 2.
[42] Federal Communication Commission Technological Advisory Council, "Interference Limits Policy: The use of harm claim thresholds to improve the interference tolerance of wireless systems" [White Paper], 2013, at 9.
[43] *Ibid.,* at 3.
[44] William W. Sharkey and Mark M. Bykowsky, *supra* note 31 at 3.
[45] Rachael O'Grady, "Dispute Resolution in the Commercial Space Age: Are All Space-Farers Adequately Catered For?" *ICC Dispute Resolution Bulletin*, Issue 3, 2021, at 55.
[46] Matteo Cappella, "The Principle of Equitable Access in the Age of Mega-Constellations" in *Legal Aspects Around Satellite Constellations* edited by Anne Froehlich, Cham: Springer Nature Switzerland AG, 2019, at 15.
[47] Laura Yvonne Zielinski, "The Rise of Satellite Arbitrations" in *The Guide to Telecoms Arbitrations* edited by Wesley Pydiamah, London: Law Business Research Ltd, 2022, at 104.

mainly concern procedures for frequency coordination and exchange of information.[48] It does not usually contain a specific dispute settlement clause in case of harmful interference to the related spectrum. There are some exceptions, such as the coordination agreement between India and Maldives concerning the *South Asia Satellite*. This agreement provides that any dispute regarding its interpretation or application shall be resolved through diplomatic channels.[49]

The alleged breach of coordination agreement may also be used as a legal basis for arbitration, pursuant if the coordination agreement contains an arbitration clause. Eutelsat SA and SES SA were parties to a dispute concerning the right to use 500 MHz of bandwidth at the 28.5 degrees East orbital position.[50] This dispute was administered by the International Chamber of Commerce of Paris in 2012.[51] This arbitration serves as an example that disputes arising from coordination agreements may be referred to an international arbitration tribunal.[52]

As the ITU Convention gives the disputing parties the freedom to choose an appropriate dispute settlement method, it would be beneficial for the parties to set a provision that appoints a specific dispute settlement method in the coordination agreement. This would become increasingly important as radio frequency usage and, subsequently, cases of harmful interference become progressively common. Disputing parties may choose the dispute settlement method deemed the most appropriate for them, such as negotiation, diplomatic channels, or arbitration.

2. Regional Practice of Good Offices

Good offices involve a third party that attempts to influence the disputing parties to enter into negotiations and come to a settlement.[53] However, this procedure is not legally binding.[54] Under the ITU, the Radiocommunication Bureau (RB) and the Radio Regulations Board (RB) are tasked to assist ITU Member States, at their request, in harmful interference disputes. However, they generally only provide administrative and technical support to end harmful interference. The functions of the RRB are closer to inquiry, as it is tasked to investigate harmful interference at the request of the RB Director. However, the resolutions and recommendations given by the RB and RRB are not legally binding to the disputing parties.[55] Since they are mainly concerned with the technical aspects of harmful interference, they also do not make recommendations regarding damage claims.

Looking at state practice, the European Union has established the Radio Spectrum Policy Group (RSPG)

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[48] Elina Morozova and Yaroslav Vasyanin, "Mechanisms for Resolving Disputes Related to Violations of Coordination Agreements," *International Institute of Space Law*, Issue 2, 2019, at 23.

[49] Article 3 of Bilateral Agreement Between India and Maldives Related to Orbit Frequency Coordination of South Asia Satellite Proposed at 48°E, 2016.

[50] SES Press Release, "SES and Eutelsat Settle Their Dispute and Conclude A Series Of Agreements Concerning The 28.5 Degrees East Orbital Position", <https://www.ses.com/press-release/ses-and-eutelsat-settle-their-dispute-and-conclude-series-agreements-concerning-285>, accessed on 1 July 2023.

[51] Eutelsat Communications Press Release, "Eutelsat statement on operations at 28.5° East", <http://www.eutelsat.com/news/compress/en/2012/html/PR%206612%20Eutelsat%20statement%2028.5°%20East/PR%206612%20Eutelsat%20statement%2028.5°%20East.html>, accessed on 22 June 2023.

[52] Laura Yvonne Zielinski, s*upra* note 37 at 111.

[53] Malcolm Shaw, *International Law,* 8th Edition, *Cambridge*: Cambridge University Press, 2017, at 770.

[54] *Ibid*., at 771.

[55] International Telecommunications Union, "Radiocommunication Bureau", <https://www.itu.int/net/ITU-R/index.asp?category=information&rlink=br&lang=en>, accessed on 4 August 2023.

through Commission Decision 2002/622/EC. The RSPG is tasked to support cross-border radio frequency coordination and is the designated forum for EU Member States to resolve disputes concerning cross-border issues.[56] The RSPG may also, when appropriate, issue an opinion to propose a coordinated solution regarding such disputes.[57] The RSPG may issue an opinion to propose a coordinated solution, or if the issue is still unresolved, the EC may implement acts to resolve the issue by implementing acts to resolve the issue at the request of the affected Member State.[58] The RPSG has carried out good offices in assisting bilateral negotiations concerning radio frequency coordination between EU Member States. For example, it assisted Croatia and Italy in their harmful interference dispute where Italian harmful interference affects Croatian television stations.[59] It may benefit other regional bodies to create a similar agency to assist in their radio frequency coordinated efforts and interstate negotiations.

3. Power Imbalance in Negotiation and Diplomatic Channels

Negotiation may be a consensual bargaining process in which the disputing parties attempt to agree on a disputed matter.[60] Negotiations between States are usually done through diplomatic channels, which are their respective foreign offices or diplomatic representatives. Alternatively, negotiations may be carried out by each party's 'competent authorities if the subject matter is deemed appropriate.[61] Competent authorities in the context of harmful interference disputes are what the ITU called 'administrations,' the government agency responsible for telecommunication-related matters, e.g., the Federal Communication Commission (FCC) for the US, the Office of Communication (Ofcom) for the UK, and the Ministry of Communication and Information Technology (Kominfo) for Indonesia. This method is considered the most flexible method of dispute settlement, as it could be tailored to the parties' preferences, needs, and desired outcomes regarding the dispute in question.[62]

In practice, negotiation is more frequently employed[63] and is responsible for resolving more disputes than other methods.[64] One of the main distinguishing features of negotiation is the absence of a neutral third-party intervention.[65] This may be preferable if the dispute involves susceptible information. An effective negotiation is one where it is conducted in good faith, and the disputing parties must "conduct themselves [so] that the negotiations

[56] Article 2(3) of the European Commission Decision of 11 June 2019 setting up the Radio Spectrum Policy Group and repealing Decision 2002/622/EC.
[57] Article 28 of Directive (EU) 2018/1972 of The European Parliament and of The Council of 11 December 2018 on Establishing the European Electronic Communications Code (Recast).
[58] Article 28.3 and 28.4 of Directive (EU) 2018/1972 of The European Parliament and of The Council of 11 December 2018 on Establishing the European Electronic Communications Code (Recast).
[59] Radio Spectrum Policy Group, "Progress Report of the RSPG Sub-Group on 'Good offices' to assist in bilateral negotiations between Member States", <https://radio-spectrum-policy-group.ec.europa.eu/system/files/2023-01/RSPG22-031final-Progress_report_Good_Offices.pdf>, accessed on 4 August 2023.
[60] Bryan A. Garner (eds.), *Black's Law Dictionary*, 9th Edition, St. Paul: Thomson Reuters, 2009, at 1136.
[61] J.G. Merrills, *supra* note 22 at 8.
[62] Michael Waibel, "The Diplomatic Channel" in *Oxford Commentaries of International Law* edited by James Crawford, et. al., Oxford: Oxford University Press, 2010, at 1090.
[63] J.G. Merrills, *supra* note 22 at 2.
[64] Tania Sourdin, *Alternative Dispute Resolution,* 5th Edition, Sydney: Thomson Reuters (Professional) Australia Ltd., 2016, at 43.
[65] Carl August Fleischhauer, "Negotiation" in *Encyclopedia of Public International Law* edited by Rudolf Bernhardt, Amsterdam: North-Holland Publishing Company, 1981, at 153.

are meaningful."[66] An example of effective negotiation is the incident between Japan and the Netherlands, where the Japanese government raised some concerns to the Netherlands government concerning possible harmful interference to their satellite from an adjacent satellite registered to the Netherlands. This matter was solved through bilateral negotiations, and no harmful interference was recorded during this process. [67]

However, negotiation does not automatically lead to a legally binding agreement that satisfies the disputing parties. Negotiation also tends to favor parties with more attributes of power,[68] As political and economic leverage favor larger States in negotiations.[69] A specific thing to note concerning the issue of harmful interference is that the number of private entities operating and providing transboundary telecommunication services in underserved regions is on the rise. As previously mentioned, internet connectivity has become increasingly important in people's lives to conduct their day-to-day activities. This need for internet connectivity may give the operator, and subsequently, the State where the operator is national, considerable leverage over the State where it provides services. In this case, if a dispute arises between the two States, the latter may not have enough bargaining power to receive a favorable outcome if the dispute is settled through negotiations. Today, most telecommunication satellite is owned and operated by one company, SpaceX, which is based in the United States of America but operates in more than 50 countries across the globe.[70] The US also has the most significant number of active satellites in orbit.[71]

Although this does not mean that the party with less power is required to agree with the more powerful party, there are not many restrictions on the more powerful disputing State from raising extreme claims or demanding certain preconditions to be fulfilled before even entering into negotiation.[72] Thus, if SpaceX or the US is a party to a harmful interference dispute, their overwhelming leverage might deter the other party from pursuing a fair negotiation to achieve a solution that satisfies both parties.

D. ARBITRATION AS THE MOST APPROPRIATE METHOD OF HARMFUL INTERFERENCE DISPUTE SETTLEMENT

Supplementary to Article 56(2) of the ITU Convention, Article 41 of the ITU Convention provides an arbitration procedure for Member States over disputes relating to interpreting or applying the ITU Constitution, Convention, or Administrative Rules. Arbitration is a dispute settlement method where the dispute is submitted to a judge or judges (arbitrators), which in principle is chosen by the parties, who agree to accept and

[66] ICJ Reports, *North Sea Continental Shelf (Germany v. Denmark; Germany v. Netherlands),* 20 February 1969, at 47.

[67] Johan G. Kroon, "Harmful Interference from the Netherlands Radiocommunication Agency Perspective" in *Dispute Settlement in Harmful Interference* edited by Mahulena Hofmann, New York: Routledge, 2022, at 166.

[68] Robert Barnidge, "The International Law as a Means of Negotiation Settlement", *Fordham International Law Journal*, Vol. 36 Issue 3, 2013, at 549.

[69] Michael Waibel, *supra* note 38 at 1097.

[70] Marcin Frąckiewicz, "Starlink's Global Reach: A Comprehensive List of Countries with Access to the Revolutionary Satellite Internet Constellation", <https://ts2.space/en/starlinks-global-reach-a-comprehensive-list-of-countries-with-access-to-the-revolutionary-satellite-internet-constellation/>, accessed on 9 June 2023.

[71] Lionel Sujay Vailshery, "Number of satellites in orbit as of February 2023, by leading nations and organizations", <https://www.statista.com/statistics/1367699/number-of-satellites-in-orbit-by-country/>, accessed on 30 June 2023.

[72] Alexander Orakhelashvili, *Akehurst's Modern Introduction to International Law*, 9th Edition, New York: Routledge, 2022, at 574.

respect the judgment (award).[73] Arbitration is a legal means of dispute settlement employed when the disputing parties want a binding decision.[74]

Article 41 of the ITU Convention gives the disputing parties the freedom to each appoint an arbitrator, who will then select a third arbitrator or, if agreed, may only designate one arbitrator. This article further states that the arbitrator(s) have the freedom to decide on the venue and the procedural law that will be applied to the arbitration,[75] And that the arbitration decision based on this procedure is final and binding for the parties to the dispute.[76] Since the method of arbitration must be done with the consent of each party, they must first agree that the dispute will be taken into arbitration.[77] Although the ITU Constitution does not regulate a compulsory method of dispute settlement, Article 1 of the Optional Protocol makes the arbitration process stipulated in Article 41 mandatory for its signatories. In practice, although Article 41 or this protocol has never been triggered to resolve a dispute concerning harmful interference, it shows the willingness of signatory States to resolve their dispute through arbitration.

Arbitration generally is established by mutual consent of the parties to the dispute.[78] This consent is explicitly expressed through a written agreement that will become the basis of the arbitration of the dispute. As with all agreements, an arbitration agreement must be created based on good faith, thus signaling the willingness of the disputing parties to settle their dispute through arbitration. This agreement also binds the parties to the arbitration proceedings. Therefore, a party to the dispute can only withdraw from the process with the explicit approval of the other party. Thus, this method provides more reliability for the settlement proceedings. The parties must also express their consent to accept the arbitral award.

Arbitration agreements can be distinguished into two types based on whether the agreement was created before the dispute, usually through a 'compromissory' clause in the initial agreement or after the dispute (*compromis)*.[79] In practice, the 'compromissory' clause usually only states that the parties agreed to bring future disputes arising from the initial agreement to arbitration. However, it generally does not further specify the details of the arbitration proceedings. Therefore, the parties would still need to make a *compromise* to determine the composition of the arbiter tribunal, the subject matter of the tribunal, the applicable law, et cetera. In an arbitration, the disputing parties may lay down the subject matter of the dispute and the criteria for the arbitral decision.[80] This may be beneficial if a party claims the harmful interference inflicts significant economic damage to its services. The party may include damage claims as part of the subject matter of the proceedings and arbitral decisions.

There are two types of arbitration: *ad hoc* arbitration and institutional arbitration.[81] *Ad hoc* arbitration is incidentally created solely to settle the dispute agreed upon in the arbitration agreement. The appointment of the arbitral tribunal and the rules of procedure are also subject to the arbitration agreement. Conversely, institutional arbitration is administered by a permanent arbitration institute, which usually has its own rules of proceedings. To cater to the potential increase in space-related disputes, some arbitration institutions have provided mechanisms to adjudicate those disputes. In 2011, the Permanent Court of Arbitration (PCA) created Optional Rules for Arbitration of Disputes

[73] Anthony Aust, *Modern Treaty Law and Practice, 2nd Edition,* Cambridge: Cambridge University Press, 2007, at 355.
[74] J.G. Merrills, *supra* note 22 at 91.
[75] Article 41(9) of the Convention of the International Telecommunications Union.
[76] Article 41(10) of the Convention of the International Telecommunications Union.
[77] Anthony Aust, *supra* note 49 at 356.
[78] United Nations Office of Legal Affairs, *Handbook on the Peaceful Settlement of Disputes between States*, New York: United Nations, 1992, at 55.
[79] *Ibid.,* at 57-58.
[80] J.G. Merrills, *supra* note 22 at 121.
[81] Mauro Rubino-Sammartano, *International Arbitration: Law and Practice*, 2nd Edition, The Hague: Kluwer Law International, 2001, at 4.

Relating to Outer Space Activities (PCA Space Rules). This rule was based on the 2010 United Nations Commission on International Trade Law (UNCITRAL) Arbitration Rules, with changes in several matters, such as waiver of immunity and confidentiality. Article 1(2) of the PCA Space Rules provides for waiving any right of immunity concerning the dispute in question, which may be advantageous when the disputing party is a governmental body. Still, the party must explicitly express its waiver of immunity related to the execution of the arbitral award.

Furthermore, a party may request to have information treated as confidential if said party deems that the information would be harmful if it were to be made public. This confidentiality is to be determined by the arbitral tribunal.[82] However, there has yet to be a publicly available record of a dispute being resolved through PCA Space Rules.[83] The issue of confidentiality may be necessary to consider in the case of harmful interference dispute settlement. Although arbitration is a private proceeding, that does not necessarily mean that the information revealed during the arbitration proceeding will be confidential and not be disclosed to the public. [84] The privacy guaranteed by arbitration is only limited to excluding the public's observation and participation in the arbitration process. In this regard, parties could submit to the arbitration to have a piece of information treated as confidential. Conversely, parties could also create a confidentiality clause in their initial agreement, detailing which information would not be disclosed to the public.[85] However, sometimes, the overriding public interest must be recognized to lift confidentiality in some circumstances, such as when the dispute involves a key player in the industry or a public company.[86]

In arbitration, the parties have the freedom to choose arbitrators. Some arbitration institutions, such as the PCA, [87] Also keep a panel of arbitrators considered experts in this area and a panel of scientific and technical experts who may be appointed expert witnesses. In cases of harmful interference especially, this freedom to choose arbitrators who are well-versed in the highly technical subject matter of radio frequency spectrum is a considerable advantage over the other methods of dispute settlement to the disputing parties, as this would assure that the proceedings would be conducted in a just and fair manner and thus resulting in a more satisfactory outcome of the arbitral award.

The arbitral award is final and binding. This means that the parties to the dispute may not appeal any provision of the arbitral award and that the award is legally binding to the disputing parties.[88] Article 41 of the ITU Convention does not explicitly regulate enforcement procedures for arbitration awards. However, in the broader framework of international law, this matter has been regulated through The Convention on the Recognition and Enforcement of Foreign Arbitral Awards 1958 (New York Convention), which stipulates that foreign arbitration decisions must be recognized and implemented in the territory of the State.[89] To date, there are 172 States parties to this

[82] Article 17(6) and 17(7) of the Permanent Court of Arbitration Optional Rules for Arbitration of Disputes Relating to Outer Space Activities.

[83] Charles B. Rosenberg and Vivasvat Dadwal, "The 10 Year Anniversary of the PCA Outer Space Rules: A Failed Mission or The Next Generation?", <https://arbitrationblog.kluwerarbitration.com/2021/02/16/the-10-year-anniversary-of-the-pca-outer-space-rules-a-failed-mission-or-the-next-generation/>, accessed on 10 July 2023.

[84] Kyriaki Noussia, *Confidentiality in International Commercial Arbitration: A Comparative Analysis of the Position under English, US, German and French Law*, Heidelberg: Springer, 2010, at 24.

[85] *Ibid*., at 31.

[86] Robert R. Bruce, et. al., *Dispute Resolution in the Telecommunications Sector: Current Practices and Future Directions*, Geneva: International Telecommunications Union, The World Bank, 2004, at 55.

[87] Permanent Court of Arbitration, "Panels of Arbitrators and Experts for Space-related Disputes", <https://pca-cpa.org/en/about/panels/panels-of-arbitrators-and-experts-for-space-related-disputes/>, accessed on 10 July 2023.

[88] Heru Sugiyono, et. al., "The Law of Arbitration Rules that are Final and Binding," *Indonesia Law Review*, Vol. 10 No. 3, at 364.

[89] Article 1 of the Convention on the Recognition and Enforcement of Foreign Arbitral Awards.

convention.[90] Under the obligations stated in this Convention, States Parties have ratified this convention into their national laws. For example, the United States has codified arbitration matters in Title 9 of the United States Code. Section 207 of Title 9 USC stipulates that to enforce a foreign arbitral award; a petition must be submitted to the District Court of the United States within three years of the award. In Indonesia, matters of arbitration and alternative dispute settlement mechanism is regulated through Law No. 30 of 1999. Article 65 of this regulation states that the District Court of Central Jakarta recognizes and enforces international arbitral awards. This demonstrates that compared to other dispute settlement methods, arbitration has an advantage in having a straightforward procedure to implement its decisions legally.

Taking note of the disadvantages of previous methods, intervention by a third party may be helpful or even necessary to increase the willingness of the parties involved in the dispute.[91] With the increasing number of private parties involved in the satellite telecommunication industry and providing their services internationally, the disputing parties may favor neutral arbitration over a particular domestic court since it guarantees more impartiality. Arbitration also offers confidentiality to guard the secrecy of sensitive information, which, as the telecommunication satellite industry becomes increasingly competitive, would be preferable for both public and private institutions who would like to keep their know-how and technical advancement from the public eye.

However, the issue of confidentiality is a double-edged sword in the context of harmful interference. The telecommunication industry is rapidly changing with the advancement of technology and the increasing role of private actors at the center of it. Although arbitration essentially guarantees confidentiality regarding the dispute at hand, neither the dispute nor the award may be studied to advance public policies and regulations.[92] Currently, there is no systematic publication of arbitral awards or decisions.[93] Future disputing parties are also unable to look into past awards to compare whether or not their arbitral award is in line with the current norm. Moreover, arbitral awards also do not set any legal precedent, as it is only binding to the disputing parties and only apply to the specific dispute that was submitted to the tribunal.[94]

Although there are some downsides to arbitration, this study believes that it is the most appropriate method to address harmful interference disputes, as it provides the most legal certainty with its final and binding decision in comparison to other methods. Parties settling their dispute through arbitration are able to utilize experts in the field to arbitrate on their dispute, ensuring a more fair decision. This method is also able to address confidentiality, which is important in the increasingly competitive industry of telecommunication satellites.

E. COMPULSORY ARBITRATION: A WAY TO MOVE FORWARD?

Currently, there is ITU has no provision concerning a compulsory method of harmful interference dispute settlement. While stakeholders to date have been largely cooperative in their efforts to resolve harmful interference, this level of voluntary cooperation may not be the norm in the future with the increasing number of private companies. Compulsory arbitration may be necessary in cases where the disputing parties are unable to come to an agreement regarding which method of dispute settlement to use to

[90] New York Arbitration Convention Contracting States, <https://www.newyorkconvention.org/countries>, accessed on 10 July 2023.

[91] Michael E. Scheinder, "Investment Disputes—Moving Beyond Arbitrations," *Diplomatic and Judicial Means of Dispute Settlement* edited by Laurence Boisson de Chazournes, Leiden: Koninklijke Brill NV, 2013, at 125.

[92] Tania Sourdin, *supra* note 54 at 28.

[93] Jane Parsons, "Publish and be damned: should we embrace the systematic publication of arbitral awards?", <http://arbitrationblog.practicallaw.com/publish-and-be-damned-should-we-embrace-the-systematic-publication-of-arbitral-awards/>, accessed on 23 July 2023.

[94] Gérardine Meishan Goh, *Dispute Settlement in International Space Law: A Multi-door Courthouse for Outer Space*, Leiden: Koninklijke Brill NV, 2007, at 118.

settle their dispute. It is also worth noting that as radio frequency is recognized as a limited natural resource, therefore compulsory arbitration may be necessary to ensure the continuous lawful usage of this resource.

As previously mentioned, the ITU has created the Optional Protocol to make the arbitration process, as stipulated in Article 41 of the ITU Convention, mandatory for its signatories, provided that the disputing parties have not agreed to utilize other method of dispute settlement.[95] To date, the signatories of the Optional Protocol have yet to trigger this mechanism. The Optional Protocol also does not contain any provision concerning limitations of the subject matter of the dispute. Any dispute concerning the interpretation or the application of the ITU regulatory framework may be submitted to arbitration under Article 41 of the ITU Convention. This article also stipulates that any arbitral award of an arbitration conducted under Article 41 is final and binding.[96]

The compulsory arbitration framework provided by UNCLOS may be relevant to look into in relation to this matter. Part XV of UNCLOS regulates the peaceful means of settlement of disputes concerning the interpretation and application of UNCLOS. Section 2 of this Part provided that any dispute concerning the interpretation and application of UNCLOS that has not been solved through the peaceful means of dispute settlement may be submitted to arbitration at the request of a party to the dispute. The arbitral award that resulted from this process is final and binding to the disputing parties.[97]

Section 3 Part XV of UNCLOS distinguished certain disputes as subject to a compulsory and binding decision and others to a compulsory yet non-legally binding decision.[98] The disputes that are subject to legally binding decisions generally involve environmental protection, scientific research, and fisheries. Conversely, disputes that are subject to non-legally binding decisions generally refer to disputes that involve vital interests of the State, such as military activities and sea boundary delimitations. This demonstrates that the subject matter of the dispute is of the utmost importance when considering whether or not arbitration should be compulsory.

As this study focuses on telecommunication satellites, the general dispute may be related to how harmful interference disrupts the telecommunication services that the operator provides. This would entail damages that must be compensated, as most telecommunication services are for-profit and the customers of the operator have paid to enjoy the telecommunication services. If there is significant economic harm and the disputing parties are unable to come to an agreement on how to settle this dispute, then compulsory arbitration with a legally binding decision may be necessary to be implemented to ensure that the damages are compensated. However, to implement this measure in the ITU regulatory framework, the ITU should first consider creating a harm-claim threshold to ensure the scope and limitation of this compulsory arbitration to ensure that this process is not being misused and does not violate any disputing parties' rights.

Additionally, The United Nations has also established lists of experts that were created based on the provision of Article 2 of Annex VIII to UNCLOS to be called upon as witnesses during the arbitration process. These lists are maintained by various UN bodies, such as the FAO, UNEP, the Intergovernmental Oceanic Commission of UNESCO, and the IMO.[99] Similarly, the RB and

[95] Article 1 of the Optional Protocol on the Compulsory Settlement of Disputes relating to the Constitution of the International Telecommunication Union, to the Convention of the International Telecommunication Union, and to the Administrative Regulations

[96] Article 41.10 of the Convention of the International Telecommunications Union.

[97] Article 11 of Annex VII of the United Nations Convention on the Law of the Sea.

[98] Articles 297 and 298 of the United Nations Convention on the Law of the Sea.

[99] Division for Ocean Affairs and the Law of the Sea, Office of Legal Affairs, United Nations, "List of experts for the purposes of article 2 of Annex VIII (Special Arbitration) to the Convention", <https://www.un.org/depts/los/settlement_of_disputes/experts_special_arb.htm>, accessed 6 August 2023.

RBB of the ITU are also comprised of experts in the telecommunication field. However, there is no specific provision in the ITU Regulatory Framework that states that the members of RB and RRB may be called upon as witnesses for the arbitration proceeding under Article 41 of the ITU Convention. Establishing lists of experts from various fields related to radiocommunication may assist the disputing parties in settling their disputes.

F. CONCLUSION

Arbitration is the most appropriate method to settle a harmful interference dispute. Pursuant to the agreement between the disputing parties, arbitration may adequately address the issue of damage claims, which is a significant advantage over the technical mechanism provided through Article 15 of the ITU Radio Regulation. Once the parties agree to settle their dispute through arbitration, the parties are bound to the arbitration agreement between them, which makes it so that no party can unilaterally withdraw from the process without the consent of the other party, ensuring more reliability of the legal proceedings.

The involvement of third parties may also increase the willingness of the disputing parties to settle their dispute, as it guarantees more impartiality. The parties may also appoint people well-versed in the subject matter as arbiters, which is especially important considering the technical nature of radio frequency interference. Although this method involves third parties, arbitration also offers confidentiality. The parties can agree not to make certain information public, even in arbitration. A party may also request to treat susceptible information as confidential. This may be preferable for a party to guard their technical advancement and industry know-how. Some arbitration institutions also keep a panel of experts that disputing parties may choose from to appoint arbitrators and expert witnesses.

Arbitral awards are final and binding. Parties have agreed to abide by the arbitration award(s) in the *compromis*, and it may also contain steps to execute the award(s).[100] Furthermore, the State party to the New York Convention 1958 must recognize and implement arbitral awards in its territory through its Courts. As most States already ratified this convention and created their mechanism to enforce arbitral awards, arbitration has the advantage of having a clear procedure to enforce its decisions, thus ensuring that the arbitral award is able to be executed at the national level.

Compulsory arbitration may also be necessary to implement in the future, as the prevalence of private companies is increasing. However, the ITU, as the main regulatory body in the field of telecommunication, must first create a harm-claim threshold and limitations to the disputes subject to this voluntary arbitration. A harm-claim threshold is the interfering signal level that must be exceeded before a party can claim that they are experiencing harmful interference.[101] Additionally, it may be beneficial for the ITU to establish expert panels as well to assist its Member States in choosing arbiters and expert witnesses to assist in the dispute settlement process and encourage Member States to utilize the arbitration procedure provided in Article 41 of the ITU Convention.

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[100] *Supra* note 76 at 65.

[101] Pierre De Vries, *et. al.*, "Interference Limits Policy and Harm Claim Threshold: An Introduction," <https://transition.fcc.gov/oet/tac/tacdocs/reports/TACInterferenceLimitsIntrov1.0.pdf>, accessed on 29 August 2023.

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