

The Continuity of Obligation to Provide the Services of Global Navigation Satellite System; Looking Space Law through the Lens of Human Rights

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Abstract

Nowadays, dramatic advancement in space technologies has impressed all the aspects of human life. The protection of human life in aviation and maritime has firmly tied to precise data and crucial information derived from the Global Navigation Satellite System (GNSS). The present article aims to find a binding solution to ensure the continuity of providing positioning satellite services for aviation and sea navigation for all States. For this purpose, after analyzing the Convention on International Liability for Damage Caused by Space Objects and the Charter on the Rights and Obligations of States Relating to the GNSS Services and the International Convention for the Safety of Life at Sea, this article seeks to address three crucial questions using the qualitative method. First, what are the harmful effects of malfunction and discontinuity of GNSS services on human life? Second, is there any obligatory provision in Space Law instruments that ensures the continuity of obligation to provide GNSS services? Therefore, from the human rights law perspective, this study tries to recognize the provision of GNSS services as a legal obligation of the provider States and prove that all the provider States should not discontinue these services.

Keywords: Space law, GNSS, discontinuity, right to life, positive obligations, *erga omnes* obligations

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1. Introduction

Following the significant breakthroughs in space activities, the ways to preserve and protect human life has changed. All space-based technologies, in particular the services of the Global Navigation Satellite System (GNSS) have revolutionized the realization of human rights to life. GNSS, by providing positioning, navigating, and timing services, strongly enables States to ensure their citizens' right to life, particularly in the realm of transport-related activities.¹ Regarding this fact, every disruption or discontinuity in these services may lead to human life loss.² Up to now, significant studies have been conducted about the legal dimensions of GNSS. It was found out that there is a need for a comprehensive liability regime for the provision of GNSS services.³ This paper, from human rights law perspective, addresses the consequences of discontinuity in GNSS services, which, according to the GNSS manual, is one of the four necessary features for safe navigating, including "accuracy, integrity, continuity, and availability".⁴ To this purpose, the study represents the distinct view recognizing the obligation to provide the GNSS services as a legal obligation of the provider State under International Human Rights Law. As an interdisciplinary study, this paper takes advantage of the comparative method to discover a legally binding solution to ensure human rights in States' space activities. The concept of the international human right to life will also be examined in the content of the International Space Law and current regulations concerning the GNSS. In the following sections: section 2 enumerates the advantages of GNSS for the enhancement of human rights to life. Section 3 examines the current regulation governing the GNSS services and addresses how much the current regulations support the right to life. In section 4, the duty of provider States to provide uninterrupted GNSS services will be surveyed in the light of the International Human Rights Law. Eventually, in section 5, it will be concluded that the International Space Law should make more attempts to harmonize its regulations with human rights considerations.

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- 1 Kasku-Jackson, J., (2016). Prohibiting interference with space-based position, navigation, and timing. *Strategic Studies Quarterly*, 10(4), p.91.
 - 2 Kong, D., (2016). Shaping a uniform governance structure over Global Navigation Satellite System (GNSS): The way of risk management. *Uniform Law Review*, 21(2-3), p.314, & also, Novák, A., et al, (2019). Experiment Demonstrating the Possible Impact of GNSS Interference on Instrument Approach on RWY 06 LZZI. *Transportation Research Procedia*, 43, p.75.
 - 3 Bower, P.R., (2004). Current Legal Issues relating to GNSS. In *Proceedings of the Forty-sixth Colloquium on the Law of Outer Space: 29 September--3 October 2003, Bremen, Germany, Amer Inst of Aeronautics &.*, p.388.
 - 4 ICAO, (GNSS) Manual in Doc 9849 (2017).

2. GNSS Services for the Promotion of the Right to Life

Navigational satellite-based data facilitate the realization of rights to life. As stipulated in the report of the International Committee of GNSS (ICG) activities, “GNSS has become an essential part of the positioning, timing and navigating aspects of ground, marine, aviation and space application”.⁵ GNSS in sea navigating plays an essential role in the prevention of crashes.⁶ Losing life is an imminent hazard when peoples are in the sea.⁷ By actions intended at assuring the safety of the ship’s positioning, a wide portion of the threat to human life will be solved.⁸ Also, in the time of disasters, the search and rescue operations to promote life safety in maritime applications are highly dependent on the positioning services.⁹ The utilization of the satellite-based telecommunication technologies is vital to achieving the purpose of the Draft Articles on the Protection of Persons in the Event of Disasters.¹⁰ In this sense, this technology is a reasonable and reliable means to decrease the probability of catastrophes and satisfy the required necessities of those involved while perfectly respecting their rights.¹¹ In aviation, with the help of accurate positioning data, aircrafts can determine their own exact situation.¹² Civil aviation also needs GNSS to achieve the required safety navigation.¹³ From human rights viewpoints, the individuals inherent right to life should be respected in every situation, during a disaster or not, whether they are in the sea, air, or everywhere else.¹⁴ Furthermore, as regulated in Human rights law instruments, all individuals “are born free and equal in dignity and rights” and “Everyone is entitled to all the rights ... without distinction”.¹⁵ In fact, equality in rights, regardless of where the individual is, forms the basis of the human rights law. These bases should be considered in all activities of States; space related activities, such as provision of satellite-based data, are not an

5 UNOOSA, A/AC. 105/1213, 2020.

6 Zannoni, D., (2015). International Law Issues Concerning the Interruption and the Degradation of the Radio-Navigation Signal. *ZLW*, 64, p.489. & Gilera, C. L., GNSS Third Party Liability: the European experience of Galileo. In 57th IAC (pp. E6-5), pp.4,5.

7 Papanicolopulu, I., (2016). The duty to rescue at sea, in peacetime and in war: A general overview. *International Review of the Red Cross*, 98(902), p.492.

8 Ibid

9 Thomas, M., et al. (2011). Navigation Space Systems: reliance and vulnerabilities. The Royal Academy of Engineering London, p.45. & Gilera, C.L., Op.cit. pp.4,5.

10 ILC, Draft Articles on the Protection of Persons in the Event of Disasters (2016).

11 Ibid, Art. 2.

12 Thomas, M., et al. Op.cit. p.45.

13 Ochieng, W.Y., et al. (2003). GPS integrity and potential impact on aviation safety. *The journal of navigation*, 56(1), p.52.

14 International Covenant on Civil and Political Right, Art. 6.

15 Universal Declaration of Human Rights, (1948), Articles 1&2.

exemption.¹⁶ Whenever the protection of life is of predominant matter, navigation satellite-based data is chiefly employed.¹⁷ Indeed, the more GNSS services become continuous and reliable, the more the realization of the right to life increases.

3. Current Regulation Governing the GNSS Services from Human Rights Law perspective

The relevant provisions for GNSS have been widely provided in some international regulations. On the one hand, it has been well established that there is a strong link between GNSS activities and fulfillment of the right to life. On the other hand, GNSS related activities of States are placed under the jurisdiction of the International Space Law because such services are emanated from “The satellites launched into and then operating in outer space”.¹⁸ In this regard, the main question is: How much has the current regulation of the International Space Law considered the human rights law considerations? Are there binding provisions in Space Law to oblige States to preserve the lives of all human beings in the time of space activities? This section addresses the comparative analysis of the provisions of the Space Law and the Maritime and Aviation regulations governing GNSS activities from the human rights law perspective.

3.1. International Space Law

While the terms “*Humanity*” and “*Humankind*”, which have been frequently used in the International Space Law instruments, demonstrate a correlation between space law and human rights considerations, there are some challenges in the International Space Law to fulfill human rights fully. The Outer Space Treaty (OST) of 1967 in Art. 3 stipulates that:

States Parties to the Treaty shall carry on activities in the exploration and use of outer space ... , in accordance with international law ... , in the interest of maintaining international peace and security and promoting international cooperation and understanding.¹⁹

This provision directly includes compatibility of activities in outer space with the International Law.²⁰ The necessity of compatibility of space activities with the human rights law, which is an inseparable branch of the international

16 Froehlich, A., & C.M. Täiatu, (2020) Space in Support of Human Rights, European Space Policy Institute, Austria. V. 23. P.V.

17 Von der Dunk, F.G., Handbook of space law. (2015): Edward Elgar Publishing, p.577.

18 Von der Dunk, F.G., (2017). Space Law and GNSS - A Look at the Legal Frameworks for “Outer Space”, p.2.

19 Outer Space Treaty, Art. 3.

20 Froehlich, A., & C.M. Täiatu, Op.cit. p.28.

law, can be deduced merely in an indirect manner. Art. 5 of the OST refers to another human rights conception. In the Article, astronauts have been regarded as humanity envoys and all States have been obligated to preserve them with reasonable aids.²¹ This Article refers to the duty of States to inform every phenomenon which endangers “*the life or health of astronauts*”.²² Although this Article is a significant step to save astronauts' life, it has some drawbacks, and inter alia only refers to the assistance which provides in the event of an accident. Professor Manfred Lachs about the reason of such protection stated that;

The mission astronauts undertake, and the risks they take, justify the special standing and legal protection provided to them.²³

According to this statement, the protection of life against the potential risks is the basis of the mentioned Article. It seems that this basis could be a common basis for protecting humanity's life on Earth too. The reason is that, the more States' space activities increase, the more life-threatening dangers resulting from such activities affect human life on Earth. This argument is justified by the equal value of human life and equality in the enjoyment of human rights for all humanity, whether in space or on the Earth. With regarding this fact, in the light of International Human Rights, the recognition of States' obligations to provide possible assistance, regardless of where they are, is necessary in order to protect all human beings' lives.

Liability-based regulations often are the most appropriate way to maintain the primary rights of people vis-vis the activities of States. In the international space law, the 1972 Liability Convention and Art. 7 of the OST contain the regulation concerning the damage originated by space objects. Art. 1(d) of the Liability Convention defines space objects as: “*component parts of a space object as well as its launch vehicle and parts thereof*”.²⁴ This Convention addresses the individual and joint liability of the launching States for the harms made by space objects. However, the damages caused by satellite services and their signals are out of the scope of the Convention because it is not clear whether signals are considered intangible parts of a satellite or not. What is more, this Convention is applied only in terms of damages caused by space objects, not space activities.²⁵ From the human rights perspective, Art. 7 of the Liability Convention is another weak point of this instrument. It excludes the national of the launching States from the scope of the Convention and makes a distinction between all human beings

21 Ibid.

22 Outer Space Treaty, Art. 5.

23 AL-EKABI, C., (October 2012). Revisiting ‘Envoys of Mankind’ in the Era of Commercial Human Spaceflight, in European Space Policy Institute, p.4.

24 Convention on International Liability for Damage Caused by Space Objects, 1972, Art. 1(d).

25 Von der Dunk, F.G., Op.cit. p.584.

damaged by the space activities.²⁶ In this regard, it is apparent that the International Space Law is chiefly State-oriented and has not paid enough attention to human rights. The present liability regulation of the Space Law, also does not embrace appropriate regulations concerning damages created by GNSS signals. However, the necessity of providing the navigation signals for all users can be deduced from Article 1 of the OST, which provides: “*The exploration and use of outer space...shall be carried out for the benefit and in the interests of all countries.*” This Article and the principle of freedom of exploration and use of outer space for all humanity apply to the GNSS-based activities.²⁷ Accordingly, all member States should undertake to provide the benefits of the peaceful use of space without discrimination.

3.2. International Maritime and Aviation Regulations Concerning the GNSS

Contrary to the International Space Law, the International Air Law and Maritime Law have paid more attention to protecting of the human right to life through regulating GNSS activities. In the aviation domain, many efforts have been made to protect human life by the International Civil Aviation Organization (ICAO). Charter of the Rights and Obligation of States Relating to GNSS as an ICAO Resolution with universal qualification includes important factors for GNSS services, such as non-discriminatory access.²⁸ According to this instrument, GNSS services should be accessible for aircrafts of all States without discrimination. In this Resolution, “*Safety of International Civil Aviation*” has been considered as “*the paramount principle*”.²⁹ So far, different views have been posed about the effectiveness of the Charter. According to some commentators, the charter is not a practical instrument because it is not mandatory; however, there is opposite view argue that;³⁰

ICAO assembly recommendations...are designed to set global norms in a field where there is widespread acknowledgment of the need for ordered conduct... they have a significant challenging effect to place them well above the low point on the continuum of normative instruments ranging from nonlaw to true law.³¹

From human rights law standpoint, provision of such vital services continuous and without interruption for all aircraft of all nations, which has

26 Ibid, p.585.

27 Von der Dunk, F. G., (2017). Space Law and ..., Op.cit. p.2.

28 Can, N., (2017). Liability for GNSS signals and services. In 2017 8th International Conference on Recent Advances in Space Technologies, p.531.

29 Res A32-19, Assembly Resolutions in Force, Doc. 9790. & also Bower, P. R. (2003). Op.cit. p.390.

30 Abeyratne, R., (2012). Vulnerabilities of the Air Transportation System to Loss or Degradation of the GPS Signal. In Air Navigation Law. Springer, p.238.

31 Ibid.

been stipulated in the charter, is compatible with the human rights principle of *equality in rights* of individuals and *the enjoyment of the right without distinction*. In fact, the provisions of the Charter have originated from *elementary considerations of humanity*, which have priority features and cannot be violated in any manner.

The necessity of navigational equipment to protect human lives on the voyage can be obviously seen at the International Convention for the Safety of Life at Sea (ICSLS). The human rights to life and safety of life at sea have been recognized as the ultimate aim of this Convention. Providing necessary assistance to a person who faces disaster at sea, regardless of nationality, also has been recognized in the convention.³² Under the regulation of chapters IV and V of the Convention, which is applicable in all maritime zones, “all ships on all voyages” should be provided by navigation equipment; however, the whole Convention is applied to commercial ships on international voyages.³³ Although the Convention provisions do not refer to the navigating satellite-based data, it implies the necessity of the navigational information in safety maritime. To assure people's safety in maritime, IMO began to set up satellite-based navigation regulations.³⁴ To this end, IMO's worldwide Radio Navigation System has contained every global navigational constellation.³⁵ IMO, also, has laid down standards for safe navigation. The performance of these standards highly depends to GNSS maritime capabilities. What is more, through the Resolution A915(22), IMO updated the user requirements for general navigation and positioning and is in a position to recognize the non-discriminatory basis of the provision of the GNSS service to maritime users.³⁶ The principle of non-discrimination is clearly seen in this document. In this regard, all maritime users, which include individuals, should enjoy these services without discrimination.

4. The obligation of the continuity of GNSS services in the light of International Human Rights Law

In this section, the protection of rights to life by space activities and the obligation to provide continuous GNSS services is justified through the superiority nature of the right to life and the concept of States' positive obligations. On the one hand, there is a direct link between the realization of

32 SOLAS Convention, Regulation 33.1.

33 IMO, SOLAS Convention, 1974, regulation of chapters IV & V, Available from: [http://www.imo.org/en/About/Conventions/ListOfConventions/Pages/International-Convention-for-the-Safety-of-Life-at-Sea-\(SOLAS\)-1974.aspx](http://www.imo.org/en/About/Conventions/ListOfConventions/Pages/International-Convention-for-the-Safety-of-Life-at-Sea-(SOLAS)-1974.aspx).

34 Kong, D., Op.cit. p.407.

35 Ibid.

36 Res. A915(22) Revised Maritime Policy and Requirements for a Future Global Navigational Satellite System. 2001.

human rights to life and States' space activities. On the other hand, due to the lack of the GNSS technology at the time of the enactment of space law regulations, neither space law treaties nor Resolutions which have been ratified by the General Assembly contain any regulation concerning the GNSS activities of States.³⁷ Although establishing the provider's forum by the International Committee of Global Navigation Satellite System is the practical way to coordinate on GNSS guidelines and ensure the continuity of such vital services, this coordination has a voluntary nature.³⁸ Overall, the current rules governing the GNSS are fragile. The international human rights law, as discussed below, can be a complement to protect the safety of life in transport-related activities.

The right to life, which is one of the fundamental human rights, is a dynamic concept. The right to life is "*the supreme right from which no derogation is permitted even in time of public emergency*" as stipulated in the General Comment No. 14 of Art. 6 of International Covenant on Civil and Political Rights (ICCPR).³⁹ International and Regional instruments have dedicated provisions to this right. These provisions make the positive as well as negative obligations for States to implement this right fully. This right is also a norm of customary international law.⁴⁰ States, besides the negative duties, which is not to put people to death willfully, have a positive obligation to support their citizen's lives.⁴¹ Moreover, "*supreme duty of States is to prevent war and other acts of mass violence which take the lives of thousands of innocent human beings*" according to General Comment No. 14. Although this general comment does not explicitly refer to the life-threatening space-based actions of States, considering the object and core of the statement, which is the protection of human life, every failure and discontinuity in satellite-based services can be regarded as an act of violence that causes to take the lives of human beings. Accordingly, the prevention of interruption in vital services is one of the supreme duties of States.

On the one hand, the concept of positive obligations has affected the implementation of all kind of human rights. On the other hand, the obligation of States to protect human rights has a priority over its other obligations.⁴² In the light of Art. 2 of ICCPR, all member States are obliged to respect and protect and fulfill the recognized rights, including the right to

37 Froehlich, A. & C.M. Tăiatu. Op.cit., p.46

38 United Nation Office for Outer Space Affair, International Committee for GNSS, available at: <https://www.unoosa.org/oosa/en/ourwork/icg/icg.html>.

39 CCPR General Comment No. 14: Article 6 (Right to Life), Nuclear Weapons and the Right to life. 9 November 1984.

40 Declaration, M., (2002). People's Right to Safety. In 6th World Conference on Injury Prevention and Control. Montreal, Canada, p.3.

41 Papanicolopulu, I., Op.cit. p.511.

42 General Comment No. 31.

life. In order to fulfill the right “*States must take positive action to facilitate the enjoyment of basic human rights*”.⁴³ The nature of the human right can determine the range of the obligations and duties of States Vis-a-Vis individuals.⁴⁴ These obligations not only are applicable in the real-world, but also take an important role in cyberspace including satellite-based communications.⁴⁵ The legal obligation under Art. 2 of ICCPR is both negative and positive in nature.⁴⁶ The protection of the right to life is not restricted to direct physical threats.⁴⁷ Accordingly, human life should be protected against the failure to take appropriate measures in disasters and refusal to provide vital satellite-based services because these are indirect threats to human life.

The procedure of the European Court of Human Rights demonstrates the broad range of positive obligations to save human life, such as the obligation to prepare the medical care and protection of life from environmental harms.⁴⁸ In the case of *Öneryıldız v. Turkey*, the court noted that the obligation “*must be construed as applying in the context of any activity, whether public or not, in which the right to life may be at stake...*”.⁴⁹ Considering the cases of the European Court of Human Rights, it is clearly determined that the protection of human lives from potential harms is the core and the main element of the State’s positive obligations.⁵⁰ In addition, “the principles of efficiency and dynamic interpretation” may be assessed as the origin of positive obligations.”⁵¹ Positive obligations are mostly applicable to protecting the person who is at risk of losing their lives at sea and in aviation.⁵² Discontinuity and intentional disruption of navigational signals not only causes adverse effects on the safety of life, but also definitely

43 <https://www.un.org/en/sections/universal-declaration/foundation-international-human-rights-law/>, accessed 25 August 2020.

44 Ibid.

45 Rona, G.A., Lauren, State responsibility to respect, protect and fulfill human rights obligations in cyberspace, p.3.

46 General Comment No. 31.

47 Probert, C.H.a.T., Securing the Right to Life: A cornerstone of the human rights system. May 11, 2016, available at: <https://www.ejiltalk.org/securing-the-right-to-life-a-cornerstone-of-the-human-rights-system/>.

48 Erikson v. Italy. 26 October 1999, (ECHR), & also Guerra and others v. Italy. 19 February 1998, (ECHR).

49 Korff, D., The right to life: a guide to the implementation of Article 2 of the European Convention on Human Rights, Human Rights Handbook. No. 8, p.59.

50 Stoyanova, V., Causation between State omission and harm within the framework of positive obligations under the European convention on human rights. Human rights law review, 2018. 18(2): pp.309-346.

51 Khrystova, G., (2019). The Doctrine of State Positive Obligations in the Human Rights Domain: Key Aspects of Understanding, in Legal journal Law of Ukraine (Ukrainian version), p.118.

52 Papanicolopulu, I., Op.cit., pp.491-514.

creates catastrophes. In this sense, the existence of the obligation to provide navigational satellite-based services is established under the positive obligation of the State to protect the human right to life in an appropriate, practical and dynamic manner.

The realization of the basic rights and freedom, elaborated in the Universal Declaration of Human rights and ICCPR, highly depends on the “*contribution that each State is willing to make, individually and collectively, now and in the future*”.⁵³ The protection of the rights to life and the prevention of catastrophes will merely occur with the cooperation and help of States to fulfill their human rights obligations. In this regard, cooperation in providing continuous navigational satellite-based services is a powerful and essential means to help States fulfill fundamental human rights to life. General Comment No. 31 of Art. 2 of ICCPR declares that “*while individuals are the main right-holders under the Covenant, every State Party has a legal interest in the performance by every other State Party of its obligations*”.⁵⁴ So, not only individuals are the certain beneficiaries of the obligation to provide satellite positioning and life-protection services, but also every State has a legal interest in providing these services. The actuality of such benefits for States results from the fact that the rules relating to fundamental human rights are *erga omnes* obligations.⁵⁵ These obligations are owed to the international community as a whole in which all States have a legal interest. Therefore, the provider States as direct duty holders of human rights obligations should take necessary actions to protect and ensure the human rights to life not only because of the non-derogation nature of the right to life but also due to *erga omnes* obligation to preserve human rights.⁵⁶ In this sense, civil aviation safety obligations, including GNSS related obligations, have roots in relations based on contracts among States as well as obligations owed to the international community too.⁵⁷ States also remain bound under the international human rights law to promote the fulfillment of the rights to life for all peoples even outside of its territory.⁵⁸ If any provider State refuses from such an obligation, having non-derogation nature, it will be responsible for ignoring its obligations under human rights law.

53 United Nation High Commissioner for Human Rights. 2004 2017 [cited 2020, available from: <https://www.ohchr.org/EN/NewsEvents/HRDay2004/Pages/objectives.aspx>.

54 General Comment No. 31 .H.R. Committee., 29 March 2004.

55 Ibid.

56 Harpur, P., (2007). The evolving nature of the right to life: the impact of positive human rights obligations. U. Notre Dame Austl. L. Rev. 9.

57 Huang, J., (2009). Aviation Safety through the Rule of Law, ICAO’s Mechanisms and Practices,. Aviation Law and Policy Series. 35(1).

58 Rona, G.A. Lauren, Op.cit., p.8.

5. Conclusion

To sum up, there is a close relation between promoting the fundamental rights of individuals and space-based technologies. The human life and safe navigation of ships and aircrafts mainly depend on GNSS services to the extent that every disruption in its services can be considered as a catastrophic threat against human rights to life. The challenge is that there are not appropriate regulations including human rights considerations in the realm of space law. The international community through the regulating GNSS-related services has taken appreciable steps to fill the current gap. The regulations of the international law of the sea and air are more complementary than space law in this issue. Besides the efforts of the international community to ensure the continuity of these services to preserve human rights, the International Human Rights Law proposes a binding solution to protect and ensure the implementation of human rights by the States providing space-based services. States are the main duty-holders of human rights obligations. These obligations are paramount and have precedence over the other obligations of States. In order to perform these obligations and subsequently realize the fundamental human rights, particularly the right to life, provider States should respect, protect, and fulfill these rights. Non-discriminatory access of all users to GNSS services, regardless of where they are, is on the basis of the human rights law to implement right to life. What has been said so far indicates that the binding obligation to continue to provide GNSS services, particularly in transport-related activities, is a reality in the light of the international human rights law. Lastly, it is appropriate that the International Space Law take serious actions to codify related regulation in the form of an independent binding instrument.

