

The 1986 United Nations Principles on Remote Sensing Dealing with the Dual-Use Nature of Space Imagery

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Abstract

The 1986 United Nations Principles on Remote Sensing represent a fundamental tool within the international legal regime governing space activities. Indeed, they provide a set of non-binding provisions to guide States willing to conduct remote sensing activities. The paper considers these Principles in light of the dual-use nature of remote sensing technology and products, as well as given the “democratisation” of the use of Earth observation data. Nowadays, remote sensing satellites are operated in many civil, commercial and military applications. In this context, it is necessary to examine the scope of the Principles in order to figure out whether the current legal framework is appropriate, in particular given the dual-use nature of satellite imagery. In addition, some legal issues arise with regard to access to and processing of data which are generated by the private sector for governmental and military uses. In fact, it is now possible to extract military information from commercial and civil Earth observation programmes. So far, the Principles have continued to prove their value and usefulness. However, they do not have been reviewed, especially as regards the technological development of space systems and the evolution of data distribution. Lastly, the paper aims to analyse the Principles by taking into account the rule of access to EO data without discrimination but nevertheless limited for national security reasons.

Keywords: remote sensing principles, international space law, national space law, data access, dissemination, dual-use, national interests

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1. Introduction

Since the beginning of the ‘Space Age’, States have deployed satellites for remote sensing (RS) activities, whether for civil or military purposes. In the middle of the 19th century, cameras were installed on balloons and airplanes.¹ Following this period, during the first two World Wars and the Cold War, aerial photography was taken for military surveillance and reconnaissance.² Then, over the years and with the technological advancement, satellites for remote sensing have been developed to a worldwide scale and utilized for various goals.

At first and until the mid-80s, remote sensing was considered as a governmental activity primarily intended to meet domestic needs, without any specific prohibition about it, and limited to a number of States with space capacities.

Nowadays, three significant features of remote sensing can be raised: (i) the diversity of actors engaged that is States, intergovernmental organizations, such as EUMETSAT, and private companies; (ii) the large availability of remote sensing products and (iii) the increasing number of users.³ Indeed, the current environment for remote sensing activities offers a broad range of actors involved, and products which are now available on Internet and associated applications such as Google Earth. Moreover, their “potential” dual use nature, which could provide significant strategic and military advantages, has raised many concerns about the use of such data.⁴

In 1972, land observation for civil purposes began with the launch of the US satellite, Landsat-1, providing data in various fields such as land use, natural resources management, agriculture and environmental monitoring. The US government was the leading user of Landsat-1 products, but it also enabled data reception by ground stations to other States through bilateral agreements. For instance, ground stations in Canada, Japan, Italy obtained raw data from Landsat-1.⁵

1 L. Schmidt, *New Tools for Diplomacy: Remote Sensing in International Law*, <https://earthobservatory.nasa.gov/features/Diplomacy> (last accessed 30 September 2020).

2 Time, *Aerial Photography Has Changed the World. Drones Are Just the Latest Example*, May 30, 2018 : <https://time.com/5281295/aerial-photography-history-drones/> (last accessed 30 October 2020).

3 F. Tronchetti, *Legal Aspects of Satellite Remote Sensing*, in F. Von der Dunk, F. Tronchetti (eds) *Handbook of Space Law*, Edward Elgar Publishing, 2015, 506.

4 U. Bohlmann, A. Soucek, *From ‘Shutter Control’ to ‘Big Data’: Trends in the Legal Treatment of Earth Observation Data*, in C. Brünner et al. (eds.), *Satellite-Based Earth Observation*, Springer, 2018, 185-196.

5 M.A. Roberts, *US Remote Sensing Data from Earth Observation – Law and Practice*, in Proceedings of the Thirty-Ninth Colloquium on the Law of Outer Space (1997), 111; P.A. Salin, *LANDSAT Contracts Signed by US Agencies with Foreign Ground Stations: Commercial Remote-Sensing from NASA Scientific Experiments to EOSAT Private Endeavours*, 41 ZLW (1992), 165 ss.

In 1986, France launched its first satellite for remote sensing activity, SPOT – *Satellite Pour l’Observation de la Terre*.⁶ Japan followed by launching in 1987 the Marine Observation Satellite (MOS)-1 dedicated to oceans observation.⁷ India launched its first remote sensing satellite in 1988 – the Indian Remote Sensing Satellite (IRS)-IA – which was developed by the Indian Space Research Organization (ISRO).⁸ In 1991, the European Space Agency (ESA) launched the Earth Resource Satellite (ERS)-1.⁹ In 1995, Canada launched Radarsat-1.¹⁰

Towards the end of the 80s, the situation changed with the early stage of the sale of Earth observation (EO) data from governmental RS satellites.¹¹ For instance, Earth observation data from the SPOT-1 satellite were distributed in 1987 by Spot Image.¹² The ensuing years saw the distribution of remote sensing data from governments to private entities. Nevertheless, until the mid-90s, notwithstanding the will of commercialisation, governments remained the primary users of EO data.

The end of the 90s marked actually the beginning of a new era with the commercialisation of remote sensing products, illustrated by an upgrade of the images’ resolution, an enhancement of the quality of the products available on the market, and a new range of users, no longer limited to governments.¹³

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- 6 European Space Agency, Earth Online, Mission Overview, *SPOT 1*: https://earth.esa.int/eogateway/missions/spot-1?category=Missions&sortBy=NEWEST_FIRST (last accessed 22 September 2020).
 - 7 Japan Aerospace Exploration Agency, *About Marine Observation Satellite-1 “Momo-1” (MOS-1)*, online : <https://global.jaxa.jp/projects/sat/mos1/index.html> (last accessed 22 September 2020).
 - 8 Government of India, Department of Space, Indian Space Research Organisation, *The Saga of Indian Remote Sensing Satellite System*, online: <https://www.isro.gov.in/saga-of-indian-remote-sensing-satellite-system> (last accessed 22 September 2020).
 - 9 European Space Agency, ERS 1 and ERS 2, online: https://www.esa.int/Applications/Observing_the_Earth/ERS_1_and_2 (last accessed 22 September 2020).
 - 10 Canadian Space Agency, *What is Radarsat-1*, online: <https://www.asc-csa.gc.ca/eng/satellites/radarsat1/what-is-radarsat1.asp> (last accessed 22 September 2020).
 - 11 R. Bender, *Launching and Operation Satellites, Legal Issues*, MartinusNijhoff Publishers, 1997, 220; H. de Santis, *Satellites, Alliance, Relations and Developing World, Commercial Observation Satellites and International Security*, the Macmillan Press, 1990, 78 ; F. Tronchetti, *Legal Aspects of Satellite Remote Sensing*, in F. Von der Dunk, F. Tronchetti (eds) *Handbook of Space Law*, Edward Elgar Publishing, 2015, 508-509.
 - 12 Spot Image is a company created in 1982, by the French Space Agency (CNES) and space industry, to commercialise space images from SPOT satellites. It is now managed by Airbus DS GEO: <https://www.intelligence-airbusds.com/en/8693-spot-67> (last accessed 20 November 2020).
 - 13 D.G. Clarke, *Access Control of Remote Sensing Satellites*, in J.F. Keeley, R.N. Huebert, eds., *Commercial Satellite Imagery and United Nations Peacekeeping*, Ashgate Publishing Company, 2004, 171.

The legal framework regulating remote sensing activity consists on a combination of international law, national regulations and data policies in terms of access, distribution and utilisation. On one hand, the international legal regime negotiated within the United Nations does not specifically deal with the privatization and commercialisation of remote sensing applications. On the other hand, States adopt national legislations in order to comply with their international obligations, and because they are internationally responsible for their national activities in outer space as mentioned in article VI of the Outer Space Treaty (OST).¹⁴ As it is noted in the third part, domestic regulations introduce systems of authorisation through licences for entities who intend to launch and operate RS systems, providing provisions in respect of gathering, utilisation and dissemination of data by operators. This leads to a disparate application of the rules concerning the availability, reliability, utilization and reproduction of remote sensing products.¹⁵ Indeed, while a vast amount of images and information are in theory available, some barriers exist to restrict the flow of remote sensing information and data.¹⁶

It has to be recalled that the first proposal for a non-binding instrument on remote sensing was presented in 1970 at the Committee on the Peaceful Uses of Outer Space (COPUOS).¹⁷ The main issue was to strike a balance between protecting national sovereignty of sensed States and freedom of observation. These differences were overcome between 1981 and 1984 and the negotiation process led to the drafting of 15 Principles and the adoption by the United Nations General Assembly of the Resolution 41/65 approved by consensus on 3 December 1986.¹⁸

The UN Principles on remote sensing belong to the category of “declarations of principles” of the General Assembly which, in legal terms, are nothing

14 *Treaty on Principles Governing the Activities of States in the Exploration and Use of Outer Space, Including the Moon and Other Celestial Bodies*, 27 January 1967, 18 U.S.T. 2410, 610 U.N.T.S. 205; T. Gillon, *Regulating Remote Sensing Space Systems – New Legislation for a New Era*, 34 *Journal of Space Law* (2008), 19.

15 See generally A. Ito, *Legal Aspects of Satellite Remote Sensing*, Brill, Vol.5, 2011; see also J.I. Gabrynowicz, *A Brief Survey of Remote Sensing Around the World*, UN/Thailand Workshop on Space Law, 18 November 2010: <https://www.unoosa.org/pdf/pres/2010/SLW2010/02-13.pdf> (last accessed 23 September 2020).

16 P. De Man, *Security Exceptions to the Free Dissemination of Remote Sensing Data: Interactions Between the International, National and Regional Levels*, in K.U. Schrogl (ed.), *Handbook of Space Security*, Springer, 2019, 13 ss (https://doi.org/10.1007/978-3-030-22786-9_119-1).

17 The first proposal relating to remote sensing was introduced by Argentina – UN Doc A/AC.105/C.2/L.73 (1970); see also G.M. Danilenko, *Outer Space and the Multilateral Treaty-Making Process*, *High Technology Law Journal*, Berkeley, 4(2), 1989, 217-247.

18 UN GA Res. 41/65, Principles relating to remote sensing of the Earth from outer space, 3 December 1986 : https://www.unoosa.org/pdf/gares/ARES_41_65E.pdf (last accessed 26 October 2020).

more than recommendations.¹⁹ Nevertheless, the Principles are considered as a fundamental tool within the international legal regime governing space activities.²⁰ The relevant element in the assessment of the legal value of the UN Principles derives from the practice of States.²¹

The legal status of the UN Principles on remote sensing is quite ‘floating’²² but they represent the only international legal instrument expressly addressing Earth observation from space in terms of freedom of remote sensing; respect for the rights and interests of sensed States; access and distribution of data. Nevertheless, they have a limited scope covering only natural resources management, land use and protection of the environment.²³ They do not concretely refer to military remote sensing activities because it is difficult to determine in practice whether a remote sensing activity²⁴ is exclusively carried out for one or more of the purposes indicated in the Principles due to the inherently dual use nature of the activity.²⁵

There is no doubt that the blurred line between military, security and purely civil applications bring new challenges for governmental entities, satellite industry and end users. Clearly, the use of EO data for civil, commercial, security and military applications is manifest, allowing new ways to make use of space applications. This reflects the fact that satellites’ capabilities are neutral and it is the way in which the recipients exploits the data that categorize their end use.²⁶

19 G. Arangio-Ruiz, *The Normative Role of the General Assembly of the United Nations and the declaration of Principles of Friendly Relations*, Collected Courses of The Hague Academy of International Law, Vol.137, Leiden-Boston, Brill, 2008, 419-742.

20 F. Von der Dunk, *Advanced Introduction to Space Law*, Edward Elgar Publishing, 2020, 59-63.

21 S. Marchisio, *The 1986 United Nations Principles on Remote Sensing : A Critical Assessment*, in *Studi di Diritto Internazionale in onore di G. Arangio-Ruiz*, Editoriale scientific, Napoli, 2004,1314-1315; J.I. Gabrynowicz, *Defining Data Availability for Commercial Remote Sensing Systems under United States Federal Law*, *Annals of Air and Space Law*, XXIII, 1999, 95-96.

22 J.I. Gabrynowicz, *The UN Principles Relating to Remote Sensing of the Earth from Outer Space and Soft Law*, in I. Marboe (eds.) *Soft Law in Outer Space: The Function of Non-Binding Norms in International Space Law*, Wien, Bohlau, 2012, 183-193.

23 M. Hofmann, *Remote Sensing*, Max Planck Encyclopedia of Public International Law, 2011.

24 According to Principle I(a) the term remote sensing refers to “*the sensing of the Earth’s surface from space by making use of the properties of electromagnetic waves emitted, reflected or diffracted by the sensed objects...*”.

25 T. Masson-Zwaan, M. Hofmann, *Introduction to Space Law*, Wolters Kluwer, 2019, 176.

26 See generally P. Gasparini Alves (ed) *Evolving Trends in the Dual Use of Satellites*, UNIDIR, 1996.

The purpose of this paper is to unearth the complicated legal issues surrounding remote sensing activities due to the dual-use nature of space imagery. Indeed, with the important changes occurred in the Earth observation data production and distribution, it is necessary to assess whether the existing legal regime can adequately regulate the activity. Hence, it is important to analyse the relevant international and national rules as well as State practice by taking into consideration the increasing number of restrictions that limit the flow and utilisation of remote sensing products. To illustrate this point, the paper reviews the data access policy of dual-use programmes from a national perspective with Pléiades, COSMO-SkyMed and TerraSAR-X as well as on a regional level with Copernicus, the European Union (EU) Earth Observation system.

2. Analysis of the 1986 United Nations Principles on Remote Sensing

2.1. Scope of Application

First, it is important to identify the scope of application of the Principles. As outlined in Principle 1(a) “... *for the purpose of improving natural resources management, land use and the protection of the environment...*”, it is evident that they do not include all RS activities and all products collected and distributed. Hence, it is relevant to examine whether dual-use satellites, such as Copernicus,²⁷ COSMO-SkyMed, Pléiades are regulated by the aforementioned Principles. The issue is of primary importance as remote sensing satellites are now used in multiple civil, commercial and military applications which may not be properly addressed in the current regime.²⁸

Principles II and III recall that RS activities have to be carried out for the benefit and in the interests of all countries. Moreover, RS missions have to be conducted in accordance with international law, in particular the UN Charter, and the Outer Space Treaty.

Principles V, VI, VII, VIII and XIII underscore the notion of cooperation as a key element to carry out RS activities. In this regard, States and international organizations have significantly contributed to the effectiveness of the principle of cooperation. Cooperation has become essential not only to improve the availability of space technology and applications so that all countries can benefit from it, but also to promote international security. The principle of cooperation has been reiterated in some important texts of the United Nations General Assembly, such as the *Declaration on International Cooperation in the Exploration and Use of Outer Space for the Benefit and*

27 F. Von der Dunk, *The ‘S’ of ‘Security’: Europe on the Road to GMES*, 4-2 Soochow Law Journal (2007), 1-27.

28 J. Monserrat Filho, *A Remote Sensing Convention for the Advancement of Space Law*, in Proceedings of the Fortu-Sixth Colloquium on the Law of Outer Space (2006), 63.

in the Interest of All States, which is the subject of Resolution 51/122 of 13 December 1996.²⁹

As regards the principles relating to data access, a general requirement in Principle IX specifies the obligation of the States that conduct RS programme to inform the Secretary-General of the United Nations, and to also communicate the relevant information to the greatest extent feasible and practicable to any other State (in accordance with art.IV of the 1975 Convention on Registration of Objects Launched into Outer Space³⁰ and art.XI of the Outer Space Treaty). Principles X and XI are complementary to each other, in the sense that Principle X protects the Earth's natural environment through the disclosure of information on possible damage to the environment, while Principle XI aims to promote the protection of mankind from natural disasters. Furthermore, Principles X and XI expressly indicate that States to be informed are not only the sensed States, but, more generally, all States concerned. In addition, informations relating to the environmental protection have a different status than the data access regime set out in Principle XII. Indeed, these principles are consistently applied and they have probably been influenced by the evolution of other areas of international law and in particular international environmental law.³¹

At the core of the legal regime established by the UN Principles on Remote Sensing, there is Principle XII relating to access to such data without discrimination. During the negotiation of the Principles, the freedom to undertake remote sensing activities was accepted in exchange of access to information. Therefore, these two principles are intrinsically linked in the proposal of 1986. This is why Principle XII recognizes the sensed States' right of access to all primary or processed data, without discrimination and at reasonable price conditions.

Finally, Principle XIV reaffirms the notion of international responsibility of States as mentioned in art.VI of the OST and precises that States operating remote sensing satellites shall bear international responsibility for their activities. It extends State's responsibility in cases where remote sensing activities are conducted by its private entities as well as governmental entities, or international organizations to which State is party.

2.2. Data Dissemination

The obligation to make RS data accessible and available to the sensed State(s) "on a non-discriminatory basis and on reasonable cost terms" does not

29 UN GA Res.A/RES/51/122, 13 December 1996: https://www.unoosa.org/pdf/gares/ARES_51_122E.pdf (last accessed 30 October 2020).

30 *Convention on Registration of Objects Launched into Outer Space*, 12 November 1975, 28 U.S.T. 695, 1023 U.N.T.S. 15.

31 S. Marchisio, *Le Régime Juridique de la Télédétection*, in P. Achilleas (ed.), *Droit de l'Espace*, Larcier, 2009, 152 ss.

prevent the free or mutual exchange of data and does not exclude their commercialisation. The licensee may establish “reasonable terms” for these data, which implies commercial tariffs. As a result, the remote sensing operator might sell data at least twice, once to the customer and once to the sensed State(s).³²

In any case, to be consistent with this fundamental principle, it is legitimate to consider that the commercialisation of EO products should not prevent the observed States’ right of access. Moreover, States should ensure that private entities comply with the principle of free access and non-discrimination access to space imagery.³³

2.3. Limits of the Principles

So far, the usefulness and the relevance of the 1986 Principles have continued to prove its worth,³⁴ but they have not been reviewed. Indeed, they do not reflect the evolution of data collection and processing techniques, and they do not take into account the need to limit the use of high resolution commercial satellite images in order to prevent such data from falling into the wrong hands.

According to Principle I(e), remote sensing activities means “*the operation of remote sensing space systems, primary data collection and storage stations, and activities in processing, interpreting and disseminating the processed data*”. The provisions are generic, and sometimes even ambiguous. In particular, they appear unsuitable and muddled to regulate the different uses of civil and military data, and the various means to gather and to distribute EO products. In fact, it is at the time of assessing and interpreting the data with the purpose of distribution and utilisation them that the nature of the RS activity can be considered as civil or military with security interests. When data are analysed, interpreted and disseminated for purely military purpose, then in that case, the activity will no longer be covered by the RS Principles.³⁵ Moreover, a remote sensing mission can be accomplished under the purposes described in Principle I(a), but the data obtained from that programme can be used for civilian or commercial aims as well as military purposes having security implications. On the contrary, military remote sensing operations

32 J.I. Gabrynowicz, *Expanding Global Remote Sensing Services: Three Fundamental Considerations*, in *Proceedings of the Workshop on Space Law in the 21st Century*, UNISPACE III, Wien, Austria, 1999, 97-104.

33 The United Nations Principles of 1986 are explicitly mentioned in the United States Land Remote Sensing Policy Act of 1992 (H.R.6133): <https://www.congress.gov/bill/102nd-congress/house-bill/6133>, subsequently amended by the Commercial Space Act of 1998 (H.R.1702): <https://www.congress.gov/bill/105th-congress/house-bill/1702>; see also A. Fontanel, J.C. Rivereau, *The Distribution of SPOT Products: the Spot Image Company*, Geocarto International, 1(3), 1986, 37-46; S. Marchisio, *Le Régime Juridique de la Télédétection... op.cit.*, 156.

34 S. Marchisio, *The 1986 United Nations Principles on Remote Sensing...*, *op.cit.*, 1337.

35 P. De Man, *Security Exceptions... op.cit.*, 6.

may benefit to civilian applications for the management of natural resources. Therefore, setting a balance between free access to and dissemination of data by remote sensing civilian programmes, and restrictions of access for military and national security interests is still complex within the Principles. They acknowledge the freedom to use outer space for remote sensing activity, but are silent on considerations of dual-use nature of the activity and national security that may limit this freedom.³⁶

In this context, governments have imposed regulatory obligations through licenses³⁷ as well as operational and technical constraints, such as controlling the shutter of any Earth observation satellite that falls under their jurisdiction, which could be exercised in the event of crisis or conflict. In such situations, governments may temporarily limit the collection or distribution of high resolution satellite images of a particular territory.³⁸ These practices must be carefully evaluated, since the availability of data is an integral part of the non-discrimination access principle, without which Principles would not make sense.³⁹ At the same time, however, restrictions reflecting security concerns cannot be considered *ipso facto* contrary to the United Nations Principles on Remote Sensing due to States' practice to enact law limiting data access to uphold national interests.⁴⁰

3. Dual-Use Nature and Security Implications: Limits to Data Distribution

3.1. Regional Level: Copernicus Programme

Copernicus is the European Union's Earth observation system.⁴¹ In 2014, the Copernicus regulation was adopted, with the aim to regulate the programme's data access policy which is based on the principle of free and open access to data obtained and collected from the 'Sentinels satellites' as well as by Copernicus contributing missions.⁴²

36 *Ibid.*, 7; see also J.P. Darnis, X. Pasco, P. Wohrer, *Space and the Future of Europe as a Global Actor: EO as a Key Security Aspect*, IAI, February 2020, 5 : <https://www.iai.it/sites/default/files/iai2002.pdf> (last accessed 25 September 2020).

37 P.J. Blount, *Remote Sensing Law: An Overview of its Development and its Trajectory on the Global Context*, in P.S. Thenkabail, *Remote Sensing Handbook*, vol.1, CRC Press 2015, 613.

38 B. Preston, *Space Remote Sensing Regulatory Landscape*, in J.C. Baker, K.M. O'Connell, R. Williamson, *Commercial Observation Satellites: At the Leading Edge of Global Transparency*. Santa Monica, CA: RAND Corporation, 2011, 501-532.

39 UNOOSA, *Meeting International Responsibilities and Addressing Domestic Needs*, Proceedings UN/Nigeria Worksho on Space Law, Vienna, 2006, 32-34: https://www.unoosa.org/pdf/publications/st_space_32E.pdf (last accessed 3rd September 2020).

40 P. De Man, *Security Exceptions ... op.cit.*, 9 ss.

41 Copernicus Website: <https://www.copernicus.eu/en> (last accessed 26 October 2020).

42 Copernicus Contributing Missions: <https://spacedata.copernicus.eu/web/cscda/data-offer/missions> (last accessed 23 September 2020).

The Copernicus regulation managed to achieve an appropriate balance between data transparency and data protection, establishing certain guarantees for the safe use of its services by end users. Its provisions could serve as a basis for further appropriated regulation of EO data access in Europe.

There are two important Regulations to take into account: (i) Regulation 377/2014 which establishes the Copernicus Programme⁴³ (before 2014, Copernicus was known as GMES – Global Monitoring for Environment and Security); and (ii) Regulation 1159/2013 which defines criteria for restricting access to such data and information.⁴⁴ According to art. 5(1) of the Reg. 377/2014, the scope of Copernicus is wider than the UN Principles on Remote Sensing as it concerns atmosphere monitoring, marine environment monitoring, land monitoring, climate change, emergency management, security service.

Chapter IV and articles 23, 24 and 25 of the Reg. 377/2014 provide that Copernicus data and information are available on a full, open and free-of-charge basis. However, such full and open access is subject to a number of predefined restrictions, including security interests and external relations of the EU or its Member States.

In the absence of specific legally binding international regime, some States have similar “shutter control” policies, which allow governments to limit data access in order to protect national interests. Indeed, States want to know “who and why” of any data access requests. These regulations have evolved over time by taking into account the necessity to regulate this highly strategic sector by governmental authorities.

43 Regulation (EU) No 377/2014 of the European Parliament and of the Council of 3 April 2014 establishing the Copernicus Programme: <https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:32014R0377&from=EN> (last accessed 30 October 2020).

44 Commission Delegated Regulation (EU) No 1159/2013 of 12 July 2013 supplementing Regulation (EU) No 911/2010 of the European Parliament and of the Council on the European Earth monitoring programme (GMES) by establishing registration and licensing conditions for GMES users and defining criteria for restricting access to GMES dedicated data and GMES service information: <https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:32013R1159&from=EN> (last accessed 30 October 2020); *see also* Proposal for a Regulation of the European Parliament and of the Council establishing the space programme of the Union and the European Union Agency for the Space Programme and repealing Regulations (EU) No 912/2010, (EU) No 1285/2013, (EU) No 377/2014 and Decision 541/2014/EU, COM(2018) 447final – 2018/0236 (COD), 6 June 2018 : https://eur-lex.europa.eu/resource.html?uri=cellar:33f7d93e-6af6-11e8-9483-01aa75ed71a1.0003.03/DOC_1&format=PDF (last accessed 26 October 2020).

3.2. National Level

3.2.1. The United States

In order to manage the dissemination of Earth observation data, the United States implemented “shutter control” procedures. Shutter control can take three forms: restricting or banning the acquisition and dissemination of satellite images for international or national security interests; prohibiting remote sensing activities over specific territories; and delays in downloading data from satellites.⁴⁵

The United States operates a clear shutter control policy embed in two different legislative instruments: (i) the *2010 National and Commercial Space Programs Act* and its programme LandSat;⁴⁶ (ii) the *Kyl-Bingaman Amendment to the 1997 National Defence Authorization Act*⁴⁷ which limits commercial satellite systems licensed by the federal government to providing imagery of Israel.⁴⁸

In the past, the U.S. intelligence community protected its national security interests in two ways: (1) spatial resolution limitations; and (2) restrictions to data access. The 1992 *Land Remote Sensing Policy Act* and the 1994 *Clinton Administration Policy on Foreign Access to Remote Sensing Capabilities* (Presidential Decision Directive (PDD 23))⁴⁹ diminished the effect of these two forms of control by permitting international access to high-resolution commercial imagery. However, the PDD 23 and the regulations implementing it contain significant guarantees for the protection of national security.⁵⁰ When receiving its license, the company agrees to comply with commercial embargoes

45 L.J. Smith, C. Doldirina, *Law Relating to Remote Sensing – Earth Observation*, in R.S. Jakhu, P.S. Dempsey, *Routledge Handbook of Space Law*, Routledge, 2017, 255.

46 Title 51 – National and Commercial Space Programs, P.L. 111-314 (H.R. 3237), in particular Subtitle VI-Earth Observation (chapters 601, 603, 605): <https://uscode.house.gov/view.xhtml?path=/prelim@title51&edition=prelim> (last accessed 30 October 2020).

47 Section 1064, Public Law 104-201, the 1997 Defense Authorization Act referred to as the Kyl-Bingaman Amendment: <https://www.govinfo.gov/content/pkg/PLAW-104publ201/html/PLAW-104publ201.htm> (last accessed 30 October 2020).

48 SpaceNews, *U.S. Government to Allow Sale of High-Resolution Commercial Satellite Images of Israel*, July 18, 2020: <https://spacenews.com/u-s-government-to-allow-sale-of-high-resolution-commercial-satellite-images-of-israel/#:~:text=A%20provision%20of%20the%201997,is%20available%20from%20commercial%20sources.%E2%80%9D> (last accessed 30 October 2020).

49 PDD-23 – U.S. Policy on Foreign Access to Remote Sensing Capabilities, March 9, 1994 : <https://fas.org/irp/offdocs/pdd/pdd-23.pdf> (last accessed 30 October 2020); see also Fact Sheet Foreign Access to Remote Sensing Space Capabilities: <https://fas.org/irp/offdocs/pdd23-2.htm> (last accessed 23 November 2020).

50 M.R. Hoversten, *U.S. National Security and Government Regulation of Commercial Remote Sensing from Outer Space*, 50 A.F.L. Rev. 2001, 266 ss.

imposed by the United States or the United Nations. Each license may also include specific restrictions.⁵¹

Through licensing rules, procedures and conditions for operation, the U.S. government seeks to protect national security interests while complying with its obligations under international space law.

3.2.2. France

In France, the *Loi relative aux opérations spatiales* no. 518 adopted on 3 June 2008⁵² aims to establish a regime of authorization and control for space activities for which France is internationally responsible. Title VII of the Law, and art.23 and 24 “*Données d’Origine Spatiale*”, provide some specific provisions regarding remote sensing activity and in particular, each private “*exploitant primaire de données spatiales*” must declare its activity to the competent administrative authority.

The Authority checks that the activities do not harm France’s fundamental interests in defense, foreign policy and international obligations and, for these purposes, it can adopt restrictive measures. The subsequent Decree no. 640 of 9 June 2009,⁵³ referring to the application of the provisions of Title VII of the Law no. 518, states that this declaration is necessary for the exploitation of data coming from sensors indicated in art.1. The Secretary-General for National Defence is designated as “competent administration” pursuant to art.2, and has the right to adopt restrictions on the exploitation of data in order to ensure the protection of France’s fundamental interests. According to art.5, these measures, adopted following the consultation of an Inter-ministerial Commission, can be of confidential nature and include, *inter alia*: immediate, total or partial suspension of previously “declared” activities; obligation to delay the programming, reception or production of images; degradation of data quality obtained, as well as limitation of geographical areas that can be observed. The operator is also required to notify by “complementary declaration” any modification about methods of data exploitation previously declared by itself.

51 *Implementation Guidance on NSC/PDD-23*, 20199, March 1998: https://aerospace.org/sites/default/files/policy_archives/Remote%20Sensing%20Policy%20Implementation%20Guidance%20Mar98.pdf (last accessed 23 November 2020).

52 *Loi n°2008-518 du 3 Juin 2008 relative aux opérations spatiales*: <https://www.legifrance.gouv.fr/loda/id/JORFTEXT000018931380/2020-10-26/> (last accessed 26 October 2020); see also P. Achilleas, *French Remote Sensing Law*, J. Space L., 34, 2008, 1.

53 *Décret n°2009-640 du 9 Juin 2009 portant application des dispositions prévues au Titre VII de la Loi n°2006-518 du 3 Juin 2008 relative aux opérations spatiales*: <https://www.legifrance.gouv.fr/jorf/id/JORFTEXT000020719167/> (last accessed 26 October 2020).

For Pléiades programme, art.12 of the *General Supply Conditions of Pléiades and Spot6/7 Satellite Imagery Products*⁵⁴ provides that Airbus DS cannot be held responsible in the absence of contractual obligations if this error is due to a force majeure event. The force majeure event designates any event beyond the reasonable control of Airbus DS as an act of terrorism, embargo, decision or regulation of government agencies issued by the French government, civil or military authorities by the United Nations.

3.2.3. **Italy**

Italy had to face some concerns relating to the data distribution generated by COSMO-SkyMed, its dual-use Earth observation system, essentially due to diverse political, strategic and economic implications associated with it.⁵⁵ The programme's legal framework consists in the Agreement concluded with France in 2001,⁵⁶ and in the collaboration between the Italian Space Agency (ISA) and the Ministry of Defense.

The cooperation between ISA and the Ministry of Defence, regarding the implementation of Italian responsibility, is defined in a Convention signed on 24 September 2002.⁵⁷ The characteristics of the dual-use system are specifically listed in art.V which provides for: (i) priority given to the Ministries of Defence in the daily planning of satellite activities; (ii) right for the two Governments to exercise their "right of veto" concerning requests for data acquisition or distribution. Moreover, art.VIII(1) defines the data's ownership rights to the Ministries of Defence for specific missions they have required. Furthermore, the French government is the owner of data obtained from the optical component (Pléiades) and the Italian government of those derived from the radar component (COSMO Sky-Med). Finally, art.VIII(2) establishes that both Parties designate an entity responsible

54 *Airbus General Supply Terms and Conditions*, June 2019: https://www.intelligence-airbusds.com/files/pmedia/public/r50137_9_tcs_merged_geostore_clean_final2.pdf (last accessed 30 October 2020).

55 N. Bini, *La Disciplina Relativa alla Distribuzione dei Dati del Sistema di Osservazione della Terra COSMO-SkyMed e Comparazione con le Normative di Altri Paesi*, in *Studi in onore di Claudio Zanghi*, vol.IV, *Diritto dello spazio e Miscellanea*, a cura di L. Panella, E. Spatafora, G. Giappichelli Editore, 2011, 21-35.

56 Agreement between the Government of the Italian Republic and the Government of the French Republic relating to Earth Observation, Legge 10 gennaio 2004, n.20, G.U. n.25 del 31 gennaio 2004, entrato in vigore il 1 settembre 2004: <https://www.senato.it/documenti/repository/eventi/dicembre2004/fscommand/Elenco%20leggi/020.pdf> (last accessed 30 October 2020).

57 The COSMO-SkyMed programme has been entrusted to ISA by a Bill of 8th August 1996, and confirmed in the 2006-2008 National Aerospace Plan, along with the Strategic Guidelines of 1998-2002 and 2003-2005, in cooperation with the Ministry of Defense, within the framework of the Intergovernmental Agreement with France.

for ensuring the processing, promotion and distribution of data to be intended for civil and commercial users.⁵⁸

Although the system is open to different categories of users, such as public, institutional, private and commercial, the two Ministries of Defence have priority in defining missions. In other words, the acquisition of military data is primary. But in any case, the mission plans drawn up by the Ministries of Defence are strictly classified and data collected throughout these missions are encrypted.⁵⁹ Data obtained specifically during military missions can only be transferred to civilian users after being degraded. On the other hand, all data produced by civilian users are accessible to the Ministries of Defence.⁶⁰ The commercial distribution of the COSMO-SkyMed products is entrusted to the company e-GEOS SpA, according to the Agreement signed between ISA and e-GEOS on 9 June 2009.⁶¹ The *General Conditions for the Provision of*

58 Art.VIII(2) of the Intergovernmental Agreement was implemented in the Interministerial Decree no. 32 of the 1st December 2006 (*Decreto Interministeriale* (Ministero dell'Università e della Ricerca, Ministero degli Affari Esteri e Ministero della Difesa) *prot. MUR-DGSSIRST n. 32 dell'1 dicembre 2006*: https://www.minambiente.it/sites/default/files/archivio/allegati/trasparenza_valutazione_merito/DPN/provvedimenti_dirigenti/div_III/ASI_MATTM_ACCORDO_LICENZA_USO_18_03_2016.pdf (last accessed 30 October 2020)) which precises ISA tasks and prerogatives for the management of COSMO-SkyMed; likewise it happened for CNES with the Decree 2004-1395 for the Pléiades programme (*Décret n°2004-1395, du 20 décembre 2004, portant application de l'article VIII de l'accord entre le Gouvernement de la République française et le Gouvernement de la République italienne relative à une coopération sur l'observation de la Terre*: <https://www.legifrance.gouv.fr/affichTexteArticle.do?idArticle=JORFARTI000001073832&cidTexte=JORFTEXT000000606452&categorieLien=id> (last accessed 30 October 2020)).

59 D. Gavoty, *The Pros and Cons of Dual Use*, CNES Magazine 2002, 17-19.

60 M. Cervino, S. Corradini, S. Davolio, *Is the peaceful use of outer space being ruled out?*, Space policy 19, 2003, 231-237.

61 Italian Space Agency website, e-GEOS: <https://www.asi.it/en/the-agency/holdings/affiliated-companies/e-geos-s-p-a/> (last accessed 22 September 2020); Telespazio website, *10 years of success in Earth observation and a future in the space economy and AI for e-GEOS, JV between Telespazio and the Italian Space Agency*, 12 December 2019: <https://www.telespazio.com/en/press-release-detail/-/detail/121219-10-years-of-success-in-earth-observation-and-a-future-in-the-space-economy-and-ai-for-e-geos-jv-between-telespazio-and-the-italian-space-agency?f=%2Fhome> (last accessed 22 September 2020); See also Report “*Politica nazionale dei dati, prodotti e Condivisione delle Risorse di COSMO-SkyMed*” drafted by ISA and the Ministry of Defense, and approved on 7th March 2007. The document contains the main principles relating to the allocation of system resources between the Ministry of Defense and ISA. See also “*Linee guida per l'utilizzo del Sistema COSMO-SkyMed*”, approved by the *Organo di Indirizzo e Coordinamento con le Istituzioni* (OICI) in February 2009. This document provides that the distribution of products must proceed through a “control grid” that acts as a filter with respect to product requests; the grid aims to regulate “sensitive situations”.

*COSMO-SkyMed Products*⁶² provides in art.5 that the user recognizes that COSMO-SkyMed is a dual-use system and that it is subject to constraints, such as the priority of the Ministry of Defense, arising from those characteristics. Furthermore, art.8 of the *End User License Agreement for COSMO-SkyMed Products*⁶³ mentions that the licensee recognizes and accepts that the competent Italian authorities may at any time prevent the reception and/or distribution of the product. The licensee therefore expressly accepts that the delivery of the product can be prevented without any liability from ISA and/or e-GEOS.

3.2.4. Germany

From a legal point of view, Germany does not have a comprehensive national legislation dealing with space activities as a whole; instead, it has established specific regulations dedicated to remote sensing activities. The drafting of the German law started with TerraSAR-X,⁶⁴ its dual-use programme for EO, and it was embodied in the *Act to Give Protection Against the Security Risk to the Federal Republic of Germany by the Dissemination of High-Grade Earth Remote Sensing Data*, also known as *Satellite Data Security Act (SatDSiG)* approved on 23 November 2007, and entered into force on 1 December 2007.⁶⁵ The Act authorizes the German government to control the collection and dissemination of high resolution satellite data in order to reduce any threat to national security, to ensure the peaceful coexistence of nations and Germany's international relations.⁶⁶

62 *General Conditions for the Provision of COSMO-SkyMed Products*, 27 March 2014: https://www.asi.it/wp-content/uploads/2019/08/LICENSE_TO_USE_-_27_March_2014.pdf (last accessed 30 October 2020); see also article 7.2 of the *e-GEOS Standard Terms and Conditions for COSMO-SkyMed Products* provides that e-GEOS will not be responsible for any shortcomings/delays in execution due to unforeseen circumstances and/or causes beyond the reasonable control of e-GEOS and/or events of force majeure, including, without limitation, governmental/civil/military authorities (*e-GEOS Standard Terms and Conditions for COSMO-SkyMed Products*, May 2010: http://earth.realvista.it/images/Satellite_data/COSMO-SkyMed/CSK_order_form.pdf (last accessed 30 October 2020)).

63 *End User License Agreement for COSMO-Sky-Med Products*, May 2010: http://share.egeos-services.it/images/Satellite_data/COSMO-SkyMed/COSMO-SkyMed_EULA.pdf (last accessed 30 October 2020).

64 *User License for the Utilisation of TerraSAR-X Data and Products for Scientific Use*: https://www.dlr.de/dlr/en/Portaldata/1/Resources/documents/TSX_User_Licence_1.1.pdf (last accessed 30 October 2020).

65 *Bundesgesetzblatt (BGBl - Federal Law Gazette), Jahrgang 2007 Teil I, Nr.58, 28 November 2007*: http://www.bgbl.de/xaver/bgbl/start.xav?startbk=Bundesanzeiger_BGBl&jumpTo=bgbl107s2590.pdf (last accessed 30 October 2020).

66 SatDSiG, Sezione 17, comma (4); see also B. Schmidt-Tedd, M. Kroymann, *Current Status and Recent Developments in German Remote Sensing Law*, 34 *Journal of Space Law* (2008), 105-114.

First of all, SatDSiG applies to high grade remote sensing systems, which are capable of acquiring data with particularly high information content.⁶⁷ A ‘sensitivity check’ is also established and it must be carried out by commercial operators before proceeding with data disclosure, in compliance with the following criteria: data content, observed area, requesting user, country of destination and time elapsed between acquisition and processing of the requested data.⁶⁸ In fact, the release of deferred data decreases its strategic value. In addition, both data producers and distributors must give data priority access to the German government in the event of emergency, such as a threat to national security. The law was consolidated by a *Statutory Ordinance on the Satellite Data Security Act*, on 26 March 2008,⁶⁹ which specifies technical parameters and various elements that allow to qualify a request as sensitive.⁷⁰

4. Concluding Remarks

The growing synergy between civil and military use of EO systems is now irreversible due to the fact that dual-use satellite programmes are able to meet the different needs of civil-commercial and military operators.

Dual-use nature of Earth observation systems and data pose regulatory and legal challenges at international and national levels. Indeed, the principle of free access to data without discrimination face to security aspects of space imagery and data priority access to governments and military in case of crisis and conflict. This fragile balance is reinforced by the easier data access by public and private entities through Internet for instance.

The issues relating to access and distribution of data from dual-use satellites are numerous and complex. Concerning remote sensing, these can be found in a lack of standardization of the legal regimes considered both at national and international level. Indeed, there is no consistency and coordination in the way that States enact RS regulations, and the international framework does not take into account the duality of EO systems and data.

National regulations on satellite remote sensing impose restrictions on commercial remote sensing satellites, in particular in terms of data collection and dissemination. There are two main purposes of this form of governmental control: the first is to safeguard national security by denying or

67 SatDSiG, BGBl.I.S. 2590, Section 2 “Definitions” paragrafi (1) 4 e (2)), and secondly, to the management and distribution of data generated by these systems (SatDSiG, Section 3 “Operator License”; Section 11 “Dissemination Licence”.

68 SatDSiG, Section 17 “Sensitivity check”.

69 *Bundesgesetzblatt Jahrgang 2008, Teil I, Nr.12, 4. April 2008*: http://www.bgbl.de/xaver/bgbl/start.xav?startbk=Bundesanzeiger_BGBl&jumpTo=bgbl108s0508.pdf (last accessed 30 October 2020).

70 Section 2 “Sensitive requests”.

limiting access to information; the second is to guarantee Government priority access to system's capabilities during time of crisis. States' necessity to implement specific regulations clearly emerges to strike a balance between the protection of political-strategic interests, and economic needs that contrast in case of remote sensing activities.

Therefore, the dual-use nature of systems and data collected make difficult to establish an appropriate legal framework applicable to products exploited for civilian and military purposes. The challenge lies in setting up a suitable regime for dual-use systems and the use of their products considering all issues involved.

In this context, a non-binding instrument related to RS data, taking into consideration the dual-use nature of the activity and products seems to be the more relevant solution in terms of flexibility in order to better abide the current EO system developments and end users requirements. Furthermore, it is clear that the creation of a legal framework on data obtained from dual-use satellite systems will promote and attract technological innovation.

