

ECONOMIC AND POLICY ASPECTS OF SPACE REGULATIONS IN EUROPE

**PART I: THE CASE OF NATIONAL SPACE LEGISLATION -
FINDING THE WAY BETWEEN COMMON AND COORDINATED ACTION**

**Report 21, September 2009
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Executive Summary

The present study embodies the first of two studies that are aimed at gaining insight into the aspects of space legislation and regulations on commercial space activities. This study builds on the analysis of existing national laws and evolves into recommendations addressed to decision makers at governmental level for the adoption of policy measures in order to promote a European approach to space commercial activities and provide for fair competition within Europe for European commercial operators and a level playing field in the international arena.

Methodology

To that aim, the methodology chosen is based first on an analysis of the implementation of international obligations by existing national space legislations in the EU. It then examines the same questions in EU associated countries and in five other countries to gain insight on those elements that affect commercial decisions and the impact of their adoption/formulation on commercial operators in Europe. In a third step, the study looks into the EU space strategy and the Lisbon goals with a view to identifying the policy mechanisms and asking why and how measures can be taken to support commercial space activities in Europe.

The study builds on relevant existing literature as well as the outcome of interviews with relevant operators and space industry representatives. The study also contains the outcome of the views of experts gathered at ESPI for a brainstorming meeting alongside the March 2009 meeting of the UNCOPUOS Legal subcommittee. It also draws from the deliberations and results of the working group on national space legislation conducted at that session.

A Comparative Look at National Laws

For the purposes of this study, space legislation must be interpreted in a narrow sense as a strict definition of space legislation

narrows the concept of space legislation to only those laws that implement the international obligations laid down by the UN treaties. Albeit space activities are concerned by many more regulations, these form part of a wider concept of space regulations that comprises legislation implementing international obligations as well as all other regulations (such regulations are the subject of the second study). In this sense, so far only a handful of countries have adopted space laws as such. Among them there are only five EU Member States, together with Ukraine and Norway among the Associate States.

While countries such as Sweden and the UK endow authorities with ample discretionary powers, and no limitation of liability or insurance, a second generation of more recent laws such as the Belgian and the Netherlands Space Activities Act aim at creating a comprehensive legal framework for their nascent commercial space activities. These laws are characterized by the introduction of innovative mechanisms mostly relating to insurance and liability (introduction of the concept of maximum probable loss, direct recourse or the limitation of liability to the insured amount) but also a strict environmental policy by the Belgian Law. Most recently, France has adopted the long-awaited French Space Operations Act. This law looks into both satellite operations and launch operations, encapsulates longstanding practice in space activities, introduces elements such as the State warranty and provides the legal basis to create clear-cut safety regulations and an institutional structure.

Many of the existing national laws, especially the most recent ones, have looked at the US and its Commercial Space Launch Act (CSLA) at the time of drafting their national laws. Terms such as the state warranty or the principle of maximum probable loss have been widely incorporated in other laws. Although the US can be taken as the reference for commercial launch activities, the division between public space programmes and commercial activities does not seem so clear in the case of other countries such as South Africa and Ukraine.

The Laws, the Legislators and the Operators

Legislation can contribute to both raising and removing market barriers for economic actors and space is not an exception to this. A first level of concern is seen at the level of authorisation, as the existence of conditions for authorisation may equate to market barriers. In view of the growing commercial activity, legislators have sought the need to establish governmental control over commercial operators in order to ensure compliance with their international obligations and their own security and safety concerns. Attached to the grant of authorisation is the safety assessment carried out by the corresponding authorities that involves compliance with safety standards as well as with financial standards and insurance requirements; authorities may also decide to include other conditions. In order to ensure the compliance with such obligations and safety requirements legislators have designed very different authorisation mechanisms ranging from case by case assessments to sophisticated licensing systems based on different degrees of authorisation.

A second level of concern is related to liability matters as, contrary to authorisation, the lack of measures regarding liability may be considered as a "market killer". Through the system of authorisations, national laws not only ensure compliance with international obligations and national security but also serve to pass liability to commercial operators who might be unreasonably constrained and placed at a disadvantage if liability is not limited or state warranties are not foreseen.

In adopting their laws, legislators have not only responded to international obligations and national security interests but have also responded to the evolution of commercial space activities in their territories. In this regard, there is a marked difference between countries with long standing traditions in space activities, usually countries with launching facilities, and those whose laws respond to low degree or prospective operations, usually only related to satellite operations.

The former have been able to incorporate their expertise into their laws and also possess well-defined institutional structures that permit exhaustive regulation and legal certainty, whereas the latter lack such expertise and infrastructure and provide for

open framework laws to be subject to case-by-case application.

As a consequence, the concern of operators about these two levels of issues is reflected in two ways: the existence vs. the non-existence of laws and the degree of flexibility of such laws. The very fact that some operators are subject to a law while others are not may already cause competitive disadvantages or advantages. It may create competitive disadvantages in those operators that may have to adapt to determined standards and conditions and be subject to time consuming assessments and even the uncertainty that authorisation will be granted. Adoption of laws based on existing expertise may lead to rubberstamping the rules for certain well-known operators affording them dominance and foreclosing the market for new operators.

While the natural behaviour of commercial operators should be to choose suppliers according to their commercial reliability and servicing, operators may be inclined to take decisions on regulatory bases rather than on market conditions. Equally, they may be inclined to create company structures in order to bypass the application of certain laws.

Finding the Way to a sound European Framework

The time seems ripe for action in the field of legislation for commercial space activities at the European level. On the one hand, the EU which is founded on the grounds of a free market and fair competition owns the legal and institutional mechanisms for tackling such deficiencies and for creating cohesion in the space legal framework in Europe. On the other hand, as a generator of economic growth, space has been called to form a relevant piece of European policy making in the context of the Lisbon Strategy and has even been introduced as a competence of its own by the Lisbon Treaty.

However, this competence has been somewhat curtailed by the exclusion of any harmonization in space which leads decision makers to the search for alternative means for the creation of the much praised coherent approach to space law in Europe. Several means have been put forward with this aim. For instance, space law could be tackled on a sector basis through the adoption of regulations related to space in the context of other policies. Even if this proved to be an



effective way of tackling space at a regulatory level, it could lead to an extremely decentralized and rather confusing space regulatory regime. However, Member States could still find a way to harmonize their laws and create European Authorities with space competence through an enhanced cooperation mechanism, whereby a minimum of 9 Member States could take the lead in the creation of a coherent “space union” in a similar fashion to Schengen. Such a “space union” of course would only apply for regulation and would not replace the existing mechanisms (such as the European Space Council and EC-ESA cooperation) in the framework of the European Space Policy. Finally, Member States may find a less demanding way out through the Open Method of Cooperation (OMC) whereby the EU would provide guidelines that would then be monitored by the Commission and implemented within national policies.

Although the creation of soft law mechanisms may be able to create a coordinated legal framework for commercial space activities in Europe, this might not suffice to ensure competitiveness. A common or coordinated legal framework must also be supported by executive infrastructure which must be able to pool the expertise and ensure the implementation of the framework while serving as a reference to other national and European authorities. This being said national and European authorities must not be shy in taking advantage of the different possibilities offered by the EU when it comes to designing a coherent legal and regulatory framework for the EU. The approach taken until now has focused on an all-embracing harmonisation. While approximation of legislation can happen through soft in the context of a *sui generis* competence, the creation of the institutional instruments related to such implementation of space law and support to further supervision may need to be based in a stronger competence. This competence may be found in other policies such as the TransEuropean Networks or may be shaped *ad hoc* through enhanced cooperation.

1. Introduction: The Setting for Implementing National Space Legislation

The legal discussion on the need for and the shaping of national space legislation is broad and well documented. At the same time, thorough analysis on the economic aspects and the political consequences of national space legislation is strikingly missing. This study tries to close this gap in that it systematically investigates the economic consequences of national space legislation in Europe and decidedly points at the political aspects of how to achieve a harmonized legislative setting in Europe. Both issues are of high relevance in the current situation, where the European Union is struggling to find effective ways and means to support European space activities in a time of global financial and economic crisis and to use space as a motor for economic growth and innovation.

1.1. The Basis in Space Law and the Rising Need for National Space Legislation

Ranging from data regulations to export control rules, space activities are subject to different space regulation and laws. This study is the first part of a set of two studies that aim at encompassing them all and is dedicated to the so called Space Laws which can be defined as the national legal acts dedicated to the implementation of international obligations laid down by the UN space treaties and which contain provisions on the authorisation, registration, supervision and liability of space operations.

The establishment of national space legislation is a consequence of the provisions contained in Art. VI of the 1967 Outer Space Treaty¹. It lays down that States Parties to

the OST bear international responsibility for national activities and that the appropriate States [have to][must] authorize and continuously supervise the activities of their non-governmental entities. Art VI OST reads in full:

States Parties to the Treaty shall bear international responsibility for national activities in outer space, including the Moon and other celestial bodies, whether such activities are carried on by governmental agencies or by non-governmental entities, and for assuring that national activities are carried out in conformity with the provisions set forth in the present Treaty. The activities of non-governmental entities in outer space, including the Moon and other celestial bodies, shall require authorisation and continuing supervision by the appropriate State Party to the Treaty. When activities are carried on in outer space, including the Moon and other celestial bodies, by an international organization, responsibility for compliance with this Treaty shall be borne both by the international organization and by the States Parties to the Treaty participating in such organization

The idea behind this provision² is to make sure that all international obligations under international space law (from liability to registration and international cooperation) are not only implemented by governmental institutions but that governments also have the [foundation][legal basis] to make their non-governmental entities (industry or non-governmental research institutions etc.) follow these provisions. Since a government can only act on the basis of laws or respective regulations, the establishment of national space laws is the most effective way of providing the State with the means to authorize and supervise non-governmental space activities.

¹ United Nations General Assembly. Treaty on Principles Governing the Activities of States in the Exploration and Use of Outer Space, including the Moon and Other Celestial Bodies, Resolution 2222 (XXI). Entered into force on 10 Oct 1967.

² Hobe, Stephan; Schmidt-Tedd, Bernhard and Kai-Uwe Schrogl (eds.): Cologne Commentary on Space Law, (Vol.1). Köln: Carl Heymanns Verlag, 2009.107-131



The issue of national space legislation has only recently, i.e. during the past two decades, become a relevant and visible topic. This is related to the primarily governmental character of space activities for the first thirty to forty years of space-faring. While commercial activities were established quite early, the privatization of space activities, including satellite launching, dates only from the past two decades. Such private satellite and launch operators (like SeaLaunch or the privatization of the international satellite operators Intelsat, Inmarsat and Eutelsat) have highlighted a third phase of regulating space activities (first drafting the treaties, then the UN General Assembly Resolutions) now focusing on dealing with these private activities.

The enacting of national space legislation has been slow from the beginning and has led to laws in only around sixteen States so far. In addition, the laws which have been enacted so far vary considerably and range from extremely short texts simply dealing with the act of authorisation (like Norway) to thoroughly elaborated texts encompassing almost all possible elements of private space activities falling under the supervision of governments (like Australia). This disparity has triggered the belief that that some kind of "approximation" of the laws is needed in order to overcome gaps and differences.

The need for such harmonization has been identified at an early stage in the legal discussion. The two broadest based research activities, "Project 2001 – Legal Framework for the Commercial Use of Outer Space" and "Project 2001 Plus - Global and European Challenges for Air and Space Law at the Edge of the 21st Century" both conducted by the Institute of Air and Space Law of the University of Cologne and the German Aerospace Center DLR, bringing together almost 100 leading experts on space law, put special focus on the establishment of national space legislation.³ The result of these deliberations was the drafting of "Building

³ See the two respective working group reports by Gerhard, M and Kai-Uwe Schrogel: "Report of the Project 2001" Working Group on National Space Legislation. "Project 2001" – Legal Framework for the Commercial Use of Outer Space. Ed. Karl-Heinz Böckstiegel. Köln: Carl Heymanns, 2002. 529-564. and Hobe, Schmidt-Tedd, Kai-Uwe Schrogel ed. Proceedings of Project 2001 Plus – Global and European Challenges for Air and Space Law at the Edge of the 21st Century. Towards a Harmonised Approach for National Space Legislation in Europe (vol. 4). 29/30 Jan 2004, Berlin, Germany. University of Cologne: Institute of Air and Space Law and the Pioneering work by von der Dunk, Frans. Private Enterprise and Public Interest in the European "Spacescape": Towards a National Space Legislation for Private space Activities in Europe. Leiden 1998.

Blocks" for national space legislation, intended to identify the most relevant provisions that should be contained in such national legislation.

1.2. The Effects of National Space Legislation and the International Debate

Commercial operators are mainly concerned with their business opportunities and the way in which laws and regulations may have an impact on the conduct of their business and their commercial relations with their customers and providers. Regulations related to space activities, especially those on frequency allotment and export control, play a crucial role in the activity of operators. The nature of national laws is however somewhat different as they are not as tightly linked to market issues as they are to security. Having been adopted as a way of keeping control over private activities, certain elements of national legislations may affect the decisions of private operators and those elements are mainly attached to authorisation and liability matters.

While such legislation is intended to have two positive effects, i.e. safeguarding the interests of the State and in that way of the public, it can on the other hand become a burden to private entities, which want to conduct and invest in space activities. They have to deal with the uncertainty of administrative procedures, technical regulations and the uncertainty of eventually being able to gain authorisation, and have to carry burdens such as providing insurance coverage. In the market place, this usually can only be outbalanced when the burdens are the same everywhere. And this again leads to the requirement for a harmonized regulatory framework on the European as well as international level.

In the inter-governmental debate, national space legislation found its entrance through the two multi-year working groups on the legal concept of the "launching State" and registration practice,⁴ which were conducted in the Legal Subcommittee of UNCOPUOS.

⁴ United Nations General Assembly. Resolution on the Application of the concept of the "launching State" Res. 59/115 of 10 Dec. 2004 and United Nations General Assembly. Recommendations on enhancing the practice of States and international intergovernmental organizations in registering space objects. Res. 62/101 of 17 Dec. 2007.

The results reached there⁵ were, first, agreement on the fact that the trend to privatization requires national space legislation and that States should consider enacting such and, second, that international (which also includes European) harmonization should be strived for. The Legal Subcommittee (LSC) has now entered a new multi-year work-plan, building expressly on the previous two work-plans, which focuses on national space legislation as such⁶ and paves the way for a possible coordinated approach resulting in a harmonized regulatory environment. This is, however, extremely difficult to achieve considering that some States have already passed national space legislation and may not be [ready][prepared] to adapt it in the near future.

1.3. The Need for Action in Europe

In this setting, Europe is confronted with various challenges regarding national space legislation. To begin with, harmonisation acquires a particular meaning in the European context as it refers to a specific means to erode market barriers when the basic principles of the internal market, such as the principle of *common recognition* and the Treaty articles on free movement and fair competition, do not suffice to overcome obstacles justified by *imperative reasons* such as safety or public health. Then European law provides the basis for approximating laws when this is necessary for the purposes of the internal market.⁷

In this context, not all space activities present the same market characteristics. Space activities, understood as launching services and the guidance of objects in orbit, belong to a quite restricted and particular market which is strongly linked to security

concerns and where harmonisation would[depart] from the traditional market oriented concept. By contrast, the delivery of signal and space based services are part of very competitive markets where there is an increasing need for the adoption of common standards in a wide range of regulatory aspects, from technical regulations to data sharing regulations. For this second market, the EU could definitely play an important role in the harmonisation of such measures through its well established harmonising mechanisms in a market environment.

The current study is the first part of a broader work that will encompass also a second part dealing with regulatory issues and the possibilities for EU harmonising actions in this field. This first part deals with the first type of space activities which forms the material scope of national space legislations in the strict sense. What then is the role of European harmonisation regarding these space activities? European action [has] particular relevance with regards to this type of activities. Even though European harmonisation at this level may not be essential, the EU can play an extraordinary role in generating guidelines and policies to approximate national legislations which would also serve as a pool of expertise and good practices for new potential legislation to draw.

Finally, space plays a leading role in the implementation of a European Plan for Innovation initiated at the European Council of 11-12 December 2008, where space technology is referred to in the Council Conclusions.⁸ Setting a conducive regulatory environment is a basic condition for its success. The recommendations of this report aim at providing an input to this debate.

⁵ Schrogl, Kai-Uwe and Charles, Davies. "A New Look at the Concept of the „Launching State“ – The Results of the UNCOPIUS Legal Subcommittee Working Group 2000-2002." *Zeitschrift für Luft- und Weltraumrecht* 51,3 (2002): 359-381. See also Schrogl and Niklas Hedman "The U.N. General Assembly Resolution 62/101 of 17 December 2007 on "Recommendations on Enhancing the Practice of States and International Organizations in Registering Space Objects."" *Journal of Space Law* 34,1 (2008): 141-161

⁶Agenda item "National legislation relevant to the peaceful exploration and use of outer space" LSC. The corresponding working group is chaired by Irmgard Marboe, the working group on the "launching State" was chaired by Kai-Uwe Schrogl and the one on registration practice by Niklas Hedman (first year)/Kai-Uwe Schrogl (last two years).

⁷ Current articles 94 and 95 TEC.

⁸ Council of the European Union. Presidency Conclusions. 17271/1/08REV 1. Brussels, 11 - 12 Dec 2008. point 18



2. National Space Legislation in European Countries and Outside: a Comparative View

Since the entering into force of the Outer Space Treaty (OST) in 1967, a hundred States have ratified this treaty dealing with the conduct of space activities by States. It sets out the basic provisions, which have been consecutively elaborated in other treaties, including the two which are relevant to this study, i.e. the Convention on International Liability for Damage Caused by Space Objects (LIAB) and the Convention on Registration of Objects Launched into Outer Space (REG). The basis for national space legislation is laid out in Art. VI OST. So far 15 countries have enacted national space laws, with a rise in numbers since the late 1990's.⁹

As pointed out in the introduction, the implementation of national space legislation is usually a reaction to the growth of privatized space activities in a country. The way it is enacted then will consequently have a decisive influence on how further private space activities will develop, since the type of activities developed in a certain country strongly influences the contents and conditions for the granting of authorisation and the setting of conditions to carry out space activities.

In response to all these factors, the variety of national space laws is as wide as their number, ranging from a single Act containing solely a prohibition on carrying out space activities without permission from the relevant Ministry¹⁰ to a set of specific Acts separately addressing launching activities, earth observation or telecommunications.

The following sections contain a brief analysis of a set of national space legislations within and outside Europe. Rather than an exhaustive academic analysis, the following sections aim at highlighting the most characteristic features of the national space legislations which are considered to have an

impact on the decisions of private and commercial operators.

For this purpose, a table is provided below with the entire set of European national space laws and a selection of four significant jurisdictions outside the European area. Having as an initial reference the building blocks identified in the framework of "Project 2001"¹¹, the table extracts and systematically organises the different elements of these national systems.

A more detailed explanation is provided in the paragraphs following the table which systematically focuses first on authorisation types, conditions and bodies, then on control mechanisms and competences and thirdly on liability and insurance matters. It concludes with a short recapitulation of the main highlights of each legislation.

The section ends with general conclusions in which the different jurisdictions are compared.

⁹ All laws can be found in Böckstiegel, Karl Heinz, Benkö Marietta and Stephan Hobe. *Space Law.-Basic Legal Documents*. Utrecht: Eleven International Publishing, 2005.

¹⁰ Act on launching objects from Norwegian territory into outer space of 13 June 1969. Art 1.

¹¹ Gerhard, Michael and Kristina Moll "the Gradual Change From Building Blocks" to a Common Shape of National Space Legislation in Europe- Summary of Findings and Conclusions. Towards a Harmonised Approach for National Space Legislation in Europe. Eds. Stephan Hobe, Bernhard Schmidt-Tedd, and Kai-Uwe Schrogl. Köln 2004. 7-50



	Sweden	UK	Belgium	The Netherlands	France	Norway	US	South Africa	Ukraine	Australia
➤ Body issuing authorisation	SNSB	BNSC	Minister of Science Policy	Minister of Economic Affairs	Ministry of Research	Not provided for by the space law	Federal Aviation Administration (FAA): launch, space transport Federal Communications Commission (FCC). Orbit authorisation Department of Defense (DoD): EO activities.	South African Council for Space Affairs	Ukrainian Space Agency	SLASO
➤ Safety assessment	Executive Agency	Executive Agency	King establishes general requirements in law + Case-by-case requirements and assessments by the Minister	Agentschap Telecom	CNES		FAA, FCC, DoD	South African Council for Space Affairs	Relevant State Authorities	Minister for Innovation, Industry, Science and Research
➤ Security assessment	Executive Agency	Executive Agency	King establishes general requirements in law + Case-b- case requirements and assessments by the Minister	Agentschap Telecom	Ministry of Research		FAA, FCC, DoD	Governmental bodies with an interest in the activity	Relevant State Authorities	Minister for Innovation, Industry, Science and Research
1.5. Conditions for Authorisation. A priori control										
➤ Technical and financial capacity	Subject to case-by-case evaluation	Subject to case-by-case evaluation Sec. 4 (2)	Prove -technical, economic capacity know-how and experience Arts.4, 5, 6 & 7 (6)	Open list in law + Subject to case-by-case evaluation Secs.3 & 6	Proof of the moral, financial, and technical guarantees (public health, safety of people, property and environment)	Not provided for by space law	Any necessary requirement imposed by the Secretary of State + financial responsibility Sec.70105	To be determined in regulations.	Prohibition of direct threat to health of humankind and damage to environment Arts.8 & 9	Sufficient funding Environmental approvals No harm to public health or public safety No damage to property
➤ Security and safety	Subject to case-by-case evaluation	Subject to case-by-case evaluation Sec. 4 (2)	Public order, national security, the equitable use of air/outer space, strategic and economic interests. + Environmental studies including use of nuclear power Costs born by private actor. + Case-by-case evaluation Arts.4, 5, 6 & 7 (6)	General obligation to preserve, environment, public order, national security. + Subject to case-by-case evaluation Secs.3 & 6	National defence interests, Fulfilment of international undertakings by France. + Awaiting further development by decree Arts. 4 & 5	Not provided for by space law.	National security & Foreign Policy interests. Secretary of State may impose any requirement necessary.	To be determined by the Council. Sec.11 (2)	Prohibition on - placement of nuclear weapons in outer space - effects on environment, military purposes, threat to humankind Pollution of outer space Art. 9	General Licence: National security Foreign policy International Obligations Permit: No nuclear weapon of mass destruction or any other kind. No fissionable material Arts.18 & 26

	Sweden	UK	Belgium	The Netherlands	France	Norway	US	South Africa	Ukraine	Australia
➤ Insurance	No obligation	Up to £ 100 M (may be contained in licence) Sec. 5(1) (f)	Facultative + amount subject to case-by-case evaluation	Compulsory + Set by the Minister at the highest coverage available in the Market Secs.3 & 6	Compulsory + Amount to be determined by decree Art.6	Not provided for by space law	\$100 M - \$ 500 M or maximum insurance available in the world market	Facultative ceiling + amount subject to case-by-case evaluation Secs.14 (1) & (2)	Compulsory. + Amount to be determined by the government. Criteria: statistical data, period of insurance, insurance market conditions Art.24	Against any liability Min insurance: maximum probable loss/the amount set out in regulations Art 43
1.6. Assessment procedure										
➤ Consultation with other bodies	National Post and Telecom Agency or other national ministries or authorities affected Decr. Sec 1	The relevant governmental departments Guidelines	Case-by-case	External parties maybe engaged to assist in the assessment of the licence application E.n. Part II , Se 5	With the authorities concerned in each case Art.4	Not provided for by space law. Potentially case-by case.	Secretary of Defence for security issues Secretary of State for Foreign Policy National Aeronautics and Space Administration for insurance matters. Secretary of Transportation for liability ceilings. Sec.70105 (a)	To be determined in regulations. Sec. 22	Ministry of Defence of Ukraine. Decisions on military and dual use space technology. Certification of military space technology Art. 20	The Ministers shall consider any submissions received
➤ Fees and deadlines	Not provided for by space law. In practice: may take 4 months	non-refundable fee of £6,500 2-6 months Guidelines	1000 € 90 days Art.9 (1) Decr. Art.13	No fee for the time being 6 months E. n Part I, Sec 3(4) Sec 5	To be determined by decree Art.4	Not provided for by space law	180 days from the application date. Sec.70105 (a)	Not provided for by space law	Not provided for by space law	Not provided for by space law
1.8. Transfer of authorisation	Not provided by the space law Transferable on a case-by-case basis?	Transfer of licence Transferable with consent of the Secretary of State + Other circumstances prescribed Sec.6(1)	Transfer of activities/real or personal rights that may involve effective control of the space object Only with authorisation by the Minister Art. 13	Not transferable Minister may authorise change of registered name Sec. 8	Transfer of the control of a space object Subject to prior authorisation by the administrative authority of the Ministry of Research Art. 3	Not provided for by the space law Transferable on a case-by-case basis?	Not provided for by the space law Transferable on a case-by-case basis?	Not provided by the space law Transferable on a case-by-case basis?	Not provided by the space law Transferable on a case-by-case basis?	Transfer of licence The Minister can transfer a licence if the transferee is eligible for authorisation Arts. 22, 31, 38
2. Registration										
Contained information	Limited to the Registration Convention Decr. Sec.4	Limited to the Registration Convention Sec.7	Limited to the Registration Convention Decr. Art.5	Limited to the Registration Convention	Limited to the Registration Convention Art.12		Limited to the Registration Convention		Limited to the Registration Convention Art.13	Limited to the Registration Convention Part 5



	Sweden	UK	Belgium	The Netherlands	France	Norway	US	South Africa	Ukraine	Australia
3. Liability										
3.1. Ceilings	Unlimited unless special reasons tell against it Case-by-case basis? Sec.6	Not fixed + Further elaboration by statutory instrument Sec.10(1)	Not fixed + May be determined by the King on a case-by-case basis Art. 15(3)	The insured sum + Maximum probable loss concept Sec. 3.4	The insured sum To be determined by the implementing decree (assumption 50-70 M €) Arts.15, 16 & 17	Not fixed Unlimited	Up to the insured amount + According to the maximum loss concept Art. 70112 (a)	Facultative. Facultative ceiling. + case-by-case basis Sec. 14 (2)	In conformity with the existing National law. Unlimited? (the private party must bear the difference) Art.25	Up to the insured amount Art.69 (3)
3.2. Cross waiver arrangements	Not provided for by Space Law. But see 3.4 Sec.6	Not provided for by Space Law. But see 3.4	Not provided for by the Space Law Case by case Art. 15(3)	Not provided for by the Space Law Sec. 11	Yes Arts.19 & 20	Not provided for by the Space Law According to general law case-by –case basis?	Yes Art. 70112 (b)	Not provided for in the Law Case-by-case basis?	Not provided for in the Law Case-by-case basis?	Not provided for in the Law Case-by-case basis?
3.3. State guarantee after ceiling	Not provided for by the Space Law	Not provided for by the Space Law	Not provided for by the Space Law	Not provided for by the Space Law	Yes Arts.15, 16 & 17	The government shall collect a payment owed for damage.	Between ceiling and \$1500 M Art. 70113 (a) (B)	Facultative ceiling. + case-by-case basis Sec. 14 (2)	Not provided for in the Law	Not provided for in the Law
3.4. Realisation	Against the person who carried out the space activity Sec.6	Against the person to whom the act applies. Sec.10(1)	Direct action against insurer Art.15(7)	Direct action against insurer Sec.12 (4)	Direct action against insurer	Not provided for in the Law	Direct action against insurer? but Insurance-warranty, against licensee Art. 70112 (f)	Not provided for by space law According to national general law?	The responsible party Art. 25	Licence can contain conditions of liability. Case-by-case basis?
4. Enforcement										
4.1. Sanctions	Imprisonment up to one year Sec. 5	Conviction on indictment. A maximum time to be determined by statute Potential conviction of offences Sec.12(2)	Penal sanction. Up to 25.000 € Up to 8 days imprisonment Art. 19	Administrative sanction. Max 450.000€ / 10% of sales Sec.15	200.000€ fines determined by the space law. Art.11	Not provided for in the law	Civil penalty ≤ \$100.000 Sec. 70115	Up to R1,000,000/imprisonment up to 10 years Sec. 23	Punishable by disciplinary, civil law or criminal penalties under general Ukrainian Law Art. 29	Civil penalties up to 5000 units (corporate) 500 individual) Art. 81

	Sweden	UK	Belgium	The Netherlands	France	Norway	US	South Africa	Ukraine	Australia
5. Compliance after authorisation. A posteriori control.										
5.1. Control mechanisms										
➤ Competent authority	SNSB	Secretary of State	<i>Ad hoc</i> committee designated by the Minister in accordance with the competent ministers and the concerned administrations	Officials designated by order of the Minister	-Government agents for space, research and the environment. -Local authorities -Agents authorised for aircraft and shipping inspections and Shipping	The Ministry to issue regulations on control.	The Secretary of State or a delegated officer or employee from the competent executive agency	Appointment of inspectors by the Council		Launch safety officer Licensed by the minister:
➤ Competence	Restriction of licence if appropriate to the circumstances. Secs. 3 & 4 Decr. Sec. 2	Competence to inspect and test equipment, collect all information, inspect and take copies of documents relating to the information required. Sec 5 (2) (a) (b) (c)	Mission and mandate term are designated by the Minister. Environmental Study may be also charged to the committee. Art. 6 Decr. Art.2	Minister may make use of administrative orders and speed procedures if threat to safety of goods and persons, national security or public order. Secs. 13 & 14	Competence to collect all information and documents required and access to all premises. Obligation of detailed notice of required info. Obligation to communicate results Arts. 7 & 8		Competence to enter sites and facilities, to seize objects, records, reports. Sec. 70115 (b)	Power to inspect any premises at any time / inspections instigated by the council. Sec. 13	Obligation of the National Space Agency, the ministries or other central executive authorities to furnish prompt and reliable information on dangers and measures to ensure safety. Art. 23	Surveillance of the launch notice, security, compliance with licence. Enter premises & inspect not without consent Arts. 50-58



2.1. European States

For the last decade Europe has been experiencing strong activity in the creation of legal frameworks for the growing private space activity in the EU member States. Currently only five EU Member States have Space Laws that implement the obligations set out by the Outer Space Treaties, Sweden being the earliest (1982) and France the most recent (2008). The aims and the context in which both these laws have been developed differ as much as do the frameworks set by the laws adopted in the period between.

While the Swedish Act on space activities was adopted in a context where public space programmes constituted the entire space activity, by contrast Acts such as the UK Outer Space Act or the Dutch Space Activities Act responded to the need to provide a legal basis for the growing industrial and satellite operation activities.

The different characteristics of European national markets have led states to different elaborations, in terms of depth and breadth, of the obligations and principles foreseen in the Outer Space Treaties, particularly those setting the basis for insurance obligations and liability requirements. Because of their uniqueness and strategic character and the difficulty of developing space technologies, space activities are intrinsically linked to national security and this is the cause for more or less stringent control requirements.

The following subsections aim at highlighting the main features of the Space Laws in those countries by putting them in an institutional and market context.

Sweden

Sweden was an early implementer of the obligations set out by the UN Space Treaties in the international context and the first among the current EU Member States (EU MS). In 1982 Sweden adopted the "Swedish Act on Space Activities" together with the "Swedish Implementing Decree on Space Activities" (hereinafter: the Swedish Law).¹²

The set composed by the Act and the Decree exhausts the Space Law of Sweden with a total of 10 articles dedicated to establishing the obligation of private actors to obtain a licence from the Swedish Government, the creation of a national register for space

¹² Swedish Act on Space Activities (1982:963) and Swedish Implementing Decree on Space Activities (1982:1069)

objects by the "National Board of Space Activities"¹³ and its role as supervisor of space activities, and foresees the application of sanctions for breach of the obligations set therein.

The adoption of this very short law took place after the reorganization of Swedish space activities¹⁴ and during the period when public programmes started to settle. In this context, the Swedish legislation responds more to institutional needs than to a commercial setting.

This is reflected in the very open formulation of the obligations. The Act imposes the obligation to obtain authorisation from the Government and appoints the National Space Board as the authority empowered to issue space licences¹⁵. However the act neither specifies further formal procedures nor does it specify explicit control conditions regarding public interest, security, public health or environment¹⁶. Instead, the law indicates that the issuing of a licence may be subject to conditions to ensure control of activities.

Read together with Section 2 of the Decree, which allocates control competences to the National Board of Space Activities, the Act establishes the basis for a very open authorisation system whereby the National Board of Space Activities has the competence to evaluate on an ad hoc basis applications for space activities.¹⁷

Equally open is the liability regime laid down by section 6 of the Act whereby it is established that persons other than the Swedish State who have carried out space activity shall reimburse the amount which has been disbursed for damages in compliance with the international agreements unless special reasons mitigate against it. Since, according to Art VII OST and LIAB, States have unlimited liability, private operators may be held unlimitedly liable for all damages caused to third parties. It is unclear what could be encompassed by the term "special reasons". However, it involves a case by case assessment that is likely to limit private undertakings' liability according to their financial capacity.

¹³ Currently the Swedish National Space Board (SNSB)

¹⁴ Nina Wormbs and Gustav Källstrand. A Short History of Swedish Space Activities. ESA (HSR-39). ESTEC, Noordwijk: 2007. 17

¹⁵ Swedish Act on Space Activities. Section 3.

¹⁶ Project 2001 plus Towards a Harmonised Approach for National Space Legislation in Europe. Proceedings of the Workshop, 29/30 January 2004, Berlin. Niklas Hedman and Richard Krauter. 85.

¹⁷ Ibid.

In conclusion, by establishing obligations to obtain authorisation for space activities and registration obligations, by setting the legal basis for control and inspection and by foreseeing a system of sanctions together with obligations related to liability, the Swedish Law forms a comprehensive framework for space activities. On the other hand, the [vague][minimal] specification of such obligations and the use of open formulas such as “unless special reasons tell against it” in Section 6 of the Act provide for a very flexible framework implying ad hoc assessment.

UK

The UK Outer Space Act of 1986 (the UK Act)¹⁸ entered into force on 31 July 1986 and was adopted in order to allow the UK to meet its international obligations related to space activities and the operation of space objects.

The Act is the consequence of the growth of commercial space activity in the UK. As the UK government lacked the competence to grant authorisation *per se*, the need was felt to create the authority to that end. The UK Act was adopted with the purpose of endowing the Secretary of State with such competence which would then be delegated to the British National Space Centre (BNSC).¹⁹

Therefore, the UK Act empowers the Secretary of State to issue authorisation for space activities and carry out control over such activities. In this regard, the UK Act is characterized by a double tier control system based on a set of conditions related to public health, safety of property and persons, international obligations and national security. Space operators do not only have to comply with this first tier of obligations at the time of being granted authorisation but may also be required to comply with a set of obligations that may be included in the Licence.²⁰

Among those facultative obligations, operators may be required to conduct operations in a way to prevent contamination of outer space, avoid interference with the activities of others in the peaceful exploration and use of outer space, avoid any breach of UK international obligations and preserve the

national security of the UK.²¹ The inspection by the Secretary of State of the licensee's facilities is also to be found in this category of obligations together with the requirement for the licensee to insure himself against third party liability.

The powers of the Secretary of State do not end in the authority to impose and evaluate on an ad hoc basis the requirements in order to grant a licence. Furthermore, the Secretary of State may even exempt activities from licensing if he is satisfied that a licence is not required for the purpose of complying with UK international obligations. Such order is, however subject to annulment by a resolution of either House of Parliament.²²

In addition the Act provides for *a posteriori* judicial control whereby a person authorised to act on behalf of the Secretary of State has the power to enter the premises of the licensee and use reasonable force if necessary. If a person is found to contravene the Act, on conviction on indictment he may be liable to a fine, and on summary conviction to a fine not exceeding the statutory maximum.

The Act is characterised by the high margin of appreciation granted to the Secretary of State regarding at the time of granting a licence. According to the Act, the secretary of State is to deem which conditions should be attached to a licence and whether the licensee is fit to carry out the intended activities as well as to carry out control of the operations and facilities.

In this vein, also Sec. 10 of the Act on the indemnification of damages caused to third parties is drafted in a way that provides wide discretion in the determination of liability. Sec 10 provides that private operators must indemnify the Government for all claims brought against the Government in respect of damage arising out of the activities carried on by the licensee. This obligation is not qualified by any cap or other mechanism that would lessen the burden to the private operator. Therefore, Sec. 10 involves unlimited liability for private operators.

All in all, the UK Act covers all international obligations in an open manner providing for ample discretionary powers of the secretary of State and no qualification of the liability conditions. Although the discretion allowed to the Secretary of State is a flexibility tool that

¹⁸ Outer Space Act 1986. Order 1989. SI 1989 No 1097.

¹⁹ Julian Hermida. *Legal Basis for a National Space Legislation*. Kluwer Academic Publishers Dordrecht/Boston/London 2004. 124

²⁰ Outer Space Act 1986. Sec 4 (1).

²¹ *Ibid.* Sec 5.

²² *Ibid.* Secs 3 (2) and (3).



allows for the adaptation to each particular case, it may also imply unpredictability. In addition the UK Act may create highly burdensome conditions regarding liability of private parties.

Belgium

On 17 September 2005 Belgium became the 3rd EU Member State to adopt a Space Law, the Law on the Activities of Launching, Flight Operations or Guidance of Space Objects²³ which on 19 March 2008 was complemented by an implementing decree.²⁴

The aim of this set of legal instruments (hereinafter: the Belgian Law) is threefold: the law is aimed at complying with international obligations; it creates a legal framework for existing and emerging activities; and it ensures the application and implementation in Belgium of international technical norms and standards.²⁵

The Belgian law was adopted as the consequence of a great potential to be held responsible for space activities. On the one hand, Belgium has a long and active tradition within ESA as the host of the ESA tracking and telemetry centre in Southern Belgium. On the other hand, due to the location of the EU institutions in Brussels and the particularities of its fiscal system, Belgium attracts an intense concentration of space industry and operators. In consideration of this critical mass, the Belgian authorities realized the responsibility to become involved in such space activities and the consequent need for legislation in this field. The Belgian law, therefore, was created not only in response to existing space activities but also in foresight of future developments.

In this context the Belgian law is characterized by a fairly open basis for authorisation and a rather precise liability regime. Understandably, the law incorporates some innovative clauses related to liability damage recovery and a strict regime for environmental supervision.

By keeping authorisation conditions very general, the Belgian Legislature seems to have opted for a case-by-case assessment

complemented by a strong control system. The Law only provides for the general obligation to ensure safety of people and property, the environment, the optimal use of air space and outer space, the strategic, economic and financial interests of the Belgian State and compliance with the Belgian State's obligations under international Law (Art 5). With the exception of the preservation of environment, these general obligations are not further detailed. The fine tuning of compliance with such obligations is left to the Minister, who is competent to attach conditions on a case-by-case basis.

To that aim, the Minister can designate experts on the basis of the reliability and experience of the private undertaking as well as on financial criteria and can impose conditions such as the technical assistance of a third party or the obligation to hold insurance against damages to third parties.

Contrary to the very open authorisation regime mentioned above, environmental obligations have been conceded special attention by the legislature. Art. 8 of the Law lays down that the Ministers shall designate experts with the purpose of assessing the impact on the environment of the activities in question together with the issuance of studies at the beginning, during and at the end of the space activities. Furthermore, the implementing decree dedicates an entire chapter laying down the contents of such studies.

A second distinguishing feature of the Belgian regime is the possibility to transfer activities to a new operator without seeking the approval of the Minister. According to Art. 13 of the Law, private undertakings are able to transfer space activities as long as the effective control of the space object is kept by the transferring undertaking.

Supervision and control of the space activities is completed with an *a posteriori* check of the activities for which the Minister may designate experts charged with controlling the activities of the operator. If as the result of the assessments carried out during the application process or the posterior control activities, the licensee is found to have not fulfilled the obligations imposed by the law or attached to the authorisation, the latter may be withdrawn or suspended.

The third of the pillars of the Belgian regime rests on an innovative regime for liability for damages to third parties. Following the obligations set out by Art. VI OST and the Liability Convention, the Belgian State shall

²³ The Law on the Activities of Launching, Flight Operations or Guidance of Space Objects. F. 2005 — 3027. Moniteur Belge [C - 2005/11439] September 2005.

²⁴ Royal Decree implementing certain provisions of the Law of 17 September 2005 on the activities of launching, flight operations and guidance of space objects. F. 2008 — 1182 Moniteur Belge [C - 2008/21031].

²⁵ Jean-François Mayence. Presentation of the Belgian Law. COPUOS 52nd Session. June 2009.

have the right to institute a counterclaim against the private undertaking which caused the damage. However Art. 15 of the Law qualifies this obligation adding that such counterclaim may only award compensation up to the limit estimated by the King on the conditions that he may determine. Therefore, private undertakings are not to be held unlimitedly liable. A second innovation in the Belgian liability regime comes with the involvement of the private party in the assessment of the damage which will be estimated by the representatives of the states concerned²⁶ with the participation of the operator or of the person designated by him. Finally the Law incorporates the so called "right of direct recourse" allowing the State to recover compensation directly from the insurer.

In conclusion, the 2005 Law is characterized by the provision of an extensive legal basis for a flexible space regime. Without creating ad hoc procedures or institutions charged with the application of international obligations, the Belgian law lays down a substantive legal basis comprehensively embracing the different aspects of international obligations while adopting an innovative approach towards liability and environment.

The Netherlands

The Netherlands "Rules Concerning Space Activities and the Establishment of a Registry of Space Objects"²⁷, the Netherlands Space Activities Act (hereinafter: the Netherlands Act), entered into force on 1 January 2008 with a twofold objective: the establishment of a licensing system for private space operators including the accompanying requirements, such as those dealing with liability and insurance; and the establishment of a National Registry for space objects.

The Netherlands Act became necessary as the consequence of recent developments in space related activities. In the years previous to the adoption of the Netherlands Act, space related activities in the Netherlands had experienced strong change in moving from governmental activities including substantial participation in intergovernmental organizations such as INTELSAT, INMARSAT and EUTELSAT, to the ownership of in orbit satellites by private telecommunication

operators.²⁸ In this context and foreseeing the further development of private space activities, the Netherlands law was adopted as a framework law that would develop along with commercial space activities.

To that aim, the Netherlands Act provides for a licensing system according to which any space activity falling within the scope of the act is prohibited and illegal if carried out without a licence. It is for the Minister of Economic Affairs to issue a licence. In this regard, the Act contains a framework of conditions of varying degrees of obligation with which the licensee must abide. On the one hand, there is a hard-core list of conditions without which the licence will not be granted: these are conditions related to safety of persons and goods, environmental protection in outer space and public order and security (Sec 6). On the other hand, there are conditions subject to case by case consideration on which basis the Minister may refuse the grant of a licence. These conditions are to be assessed in the light of the previous or the foreseeable conduct of the applicant and his capacity to fulfil the conditions established in the Act.²⁹ The licence may incorporate regulations and restrictions related to the "hard-core" obligations, financial security and the fulfilment of the international obligations of the State.

One key condition for the granting of a licence under the Netherlands Act is that the prospective licensee must maintain insurance cover for liability arising from space activities for which a licence is requested. The Netherlands Act brings a remarkable innovation in this respect as it incorporates the criterion of the "maximum possible cover". According to this criterion the Minister shall consider what can reasonably be covered by insurance.³⁰ As will be seen later, this criterion becomes of crucial relevance when linked to liability provisions.

Sec. 13 of the Act embodies the legal basis for supervision of the space activities. According to this section, the Minister shall designate officials charged with the supervision of compliance with the conditions laid down in the Act and also those attached to the licence. Non-compliance with such conditions results in the revocation of the

²⁶ UNGA. Convention on International Liability for Damage Caused by Space Objects (The Liability Convention). Entered into force on 1 Sep. 1972.

²⁷ Law Incorporating "Rules Concerning Space Activities and the Establishment of a Registry of Space Objects. 80 Staatsblad (2007).

²⁸ Von der Dunk, Frans "The case of the Netherlands." Nationales Weltraumrecht. National Space Law. Development in Europe-Challenges for Small Countries. Eds. Christian Brünner and Edith Walter. Wien -Köln-Graz: Böhlau, 2008. 93-97.

²⁹ Ibid. sec 6 (2)

³⁰ Ibid. sec 3 (4)



licence and administrative penalties that must be commensurate with the seriousness and duration of the infringement and with the extent to which the perpetrator is at fault.

Chapter 4 of the Act deals with redress in case of damages caused to third parties due to the space activities. In compliance with Art. VII of the OST and the Liability Convention, the State is entitled to recover from the private undertaking the sum paid by the State. Here the Netherlands Act expressly limits the liability of the private undertaking to providing redress only up to the value of the sum insured.

In conclusion, the Netherlands Act is a framework law leading to a case by case assessment and providing for a flexible setting as well as the basis for further development of space law as the industry's activities and expertise grow.³¹

France

The most recent of the space laws in Europe, the "French Space Operations Act" (SOA),³² was adopted by the French Senate on 22 May 2008 and is accompanied by a "decree on authorisation",³³ the decree on the reform of the French Space Agency (CNES),³⁴ and the decree on "space based data management"³⁵ which were adopted by the French Senate on 9 June 2009. The SOA aimed at creating a legal framework that would embrace and provide legal certainty for a growing trend of commercial space activities.

France is the third major space faring country in the world and the main launching state in Europe. From the beginning of the space era, France has developed a robust space sector through the participation of the public sector in space activities which led to a favourable environment for the development of commercial activities where governmental control through CNES was not present.

³¹ Von der Dunk, Frans "Implementing the United Nations Outer Space Treaties- the Case of the Netherlands." Christian Brünner and Edith Walter (eds.) National Space Law, "Development in Europe-Challenges for Small Countries", Böhlau Verlag. Wien-Köln-Weimar:2008. 81-104.

³² Loi n° 2008-518 du 3 juin 2008 relative aux opérations spatiales. JORF 04.06.2008

³³ Décret n° 2009-643 du 9 juin 2009 relatif aux autorisations délivrées en application de la loi n° 2008-518 du 3 juin 2008 relative aux opérations spatiales.

³⁴ Décret n°2009-644 du 9 juin 2009 modifiant le décret n°84-510 du 28 juin 1984 relatif au Centre national d'études spatiales.

³⁵ Décret n° 2009-640 du 9 juin 2009 portant application des dispositions prévues au titre VII de la loi n° 2008-518 du 3 juin 2008 relative aux opérations spatiales

Building on the long standing practice of France in the space field, the SOA was then adopted as the means to ensure legal certainty for commercial operations.³⁶

One of the most remarkable aspects of the Act is the system of authorisation and licences designed in Art.4. The act requires that every operator falling within the scope of this Act must obtain authorisation, which is granted by the administrative authority of the Ministry of Research if the operation does not jeopardize the interests of national defence or the fulfilment of international undertakings by France. Authorisation is only granted after the operator's technical, moral, financial and professional capacities have been assessed and proven by the administrative authority. The Act does not regulate the authorisation procedure and does not contain a concrete list of requirements to be fulfilled but leaves the further elaboration of procedural matters to the "decree on authorisation."³⁷

According to this system, operators may be granted either a single authorisation per operation after a full assessment of the guarantees, or they can be granted a licence attesting to a certain degree of compliance with the guarantees as follows:

- a. A license attesting the moral, financial and professional guarantees coupled with individual authorisations for technical requirements
- b. A licence attesting to moral, financial and professional guarantees and technical requirements coupled with authorisation for other technical requirements.
- c. A license equivalent to authorisation for determined operations and a limited period of time.

According to the "decree on authorisation" the assessment of the requirements laid down by the decree falls within the competence of the Ministry of Research which registers the application and transmits it to the CNES for technical assessment once the Ministry is satisfied that all moral, financial and professional conditions are met (Arts. 1-3 "decree on authorisation"). Administrative

³⁶ Intervention of Jean-Marc Sauvé during the "Colloque «Droit de l'espace.»" Conseil d'Etat . 31 Jan 2007.

³⁷ The assessment of such conditions is within the competence of the ministry of research which is in charge of space affairs. Moral, financial and professional requirements are assessed by the ministry while technical assessment is delegated to CNES. Presentation of the French Space Operations Act, COPUOS legal subcommittee 2008.

requirements are listed in the “decree on authorisation” and technical requirements are left to CNES.

The decree also foresees the obligation of space operators to obtain insurance (Arts 16-18) and foresees the possibility to suspend such obligation for a limited period of time if the insurance market is not cannot provide insurance coverage. One additional novelty of the French system consists on the possibility to exempt satellite operators from the obligation to be insured for operation phases which do not involve the change of orbital position or other manoeuvring.

In addition, the operator may still need to comply with additional obligations attached by the administrative authority to the authorisation/licence regarding safety of people and property, the protection of public health and the environment.³⁸ On the other hand, the “decree on authorisation” foresees the obligation.

By contrast with the general formulation of the obligations to be fulfilled in order to be granted authorisation, the Act elaborates extensively on the control mechanisms and authorities competent to carry out inspections after the grant of authorisation (Art. 7 SOA). Equally explicit is Art. 11 SOA dedicated to sanctions where lump sums of €200.000 are indicated as the amount of a fine in cases where an operator acts without authorisation or does not comply with the requirements specified by the administrative authority.

A final highlight of the Act is its compensation scheme for damages caused to third parties. Art. 6 of the Act imposes a further obligation on operators in order to be eligible for authorisation: operators must be insured up to the amount they may be held liable for. Although this is a common clause in all space laws, the peculiarity of the French system lies in the fact that the amount to be insured is linked to the amount up to which the private operator shall be held liable. In fact, the Act previews that a ceiling will be fixed according to the criteria of Art 13 and French financial law. Finally, the operator benefits from the so called “state guarantee” for the portion of liability exceeding the ceiling whereby the State covers the portion of damages beyond the ceiling.

³⁸ Art 5. SOA

The French Space Operations Act has brought to an end the so called “French paradox”³⁹ by designing within a single legal instrument the basis for an entire space regime in accordance with international obligations. The Act not only provides inspiring principles for further regulation and institutional development but also creates a new and flexible authorisation system and non-stringent liability scheme.

Notable exceptions

The French is as not the only paradoxical case in the European landscape. In fact two other countries in Europe which are major contributors to ESA, i.e. Italy and Germany, have not yet adopted any space Law. Both have been working for a long time on the draft of a space law. In Germany the efforts have been focused on the elaboration of a substantive data law before the adoption of a national Space Law, however administrative reasons have impeded it. Whereas so far, administrative reasons have impeded an encompassing German space law, executive agents at Federal Ministry level have announced that works shall be resumed in the coming legislative period.

2.2. European Associated Countries

Norway

If the Norwegian act is worth mentioning, this is for its brevity and simplicity. Norway passed an act to implement its international obligations for authorisation of space activities as early as 1969.⁴⁰

The Law sets out the legal basis for a national authorisation system to comply with the obligation set out by Art VI OST. It does not provide for any further legal basis on other questions such as liability or registration but does state in the last indent of Art. 1 that certain terms can be set for such permission “as described in paragraph one”.

³⁹ Schmidt-Tedd, Bernhard and Isabelle Arnold. “The French Act relating to space activities. From international law idealism to national industrial pragmatism”. ESPI Perspectives 11. Aug 2008

³ Aug 2009 http://www.espi.or.at/images/stories/dokumente/Perspectives/espi-perspectives_11.pdf and Couston, Mireille “La loi Française sur les opérations spatiales”, ZLW 58 Jg 2/2009. 253.

⁴⁰ Act on Launching Objects from Norwegian Territory etc. into Outer Space, 13 June no. 38.1969.



With regards to further implementation of safety, control and sanction mechanisms this may be subject to further regulations issued by the Ministry.

All in all, by its simplicity, the Norwegian Act sets the basis for further development of a more elaborated legal regime for space as well as for an authorisation system that may, for instance, include conditions on safety, insurance and environment standards.

Ukraine

Space Activities in Ukraine are regulated through the Ordinance of the Supreme Soviet of Ukraine on Space Activity⁴¹ adopted on 15 November 1996 (hereinafter the Ukrainian Law) that is aimed at creating an all embracing regime for all space activities in Ukraine.

Since its foundation as an independent country after the break-up of the Soviet Union, Ukraine has been immersed in a [constant] effort to join the community of democratic states for which it has embarked on a serious effort to establish its own legal system which would also contemplate the implementation of national treaties alongside coordination with the EU and US. The Ukrainian law is one example of this effort. In its effort to set a legal framework to provide for legal certainty and the basis for swift economic activity, the Ukrainian Law designs an all embracing framework covering all types of space activities from national programs through private space activities to military space activities. Among other provisions, the Ukrainian Law establishes a set of obligations regarding licensing, safety certification, and the conditions for liability.

Although Article 10 provides for a licensing obligation, further conditions are not necessarily attached to private activities: safety certification is described by reference to a list of regulations that shall be developed and to national law regarding safety and environment and obligatory insurance and liability are also regulated by reference to national law. In this regard, regulations of other branches of national law can apply to space activities and this may not be completely suited to space activities.⁴²

Finally, the 1996 Ukrainian Law expressly charges three different authorities with space

⁴¹ Ordinance of the Supreme Soviet of Ukraine on Space Activity of 15 November 1996 (VVRU, 1997, P. 2).

⁴² Frans von de Dunk and Sergei A. Negoda . Ukrainian Space Law from an international perspective. Space Policy. 18 (2002) 15-23.

competence: the NSAU is in charge of licensing and safety certification; the Ministry of Defence and other executive authorities within their competence are involved in safety certification; and the Cabinet of Ministers is competent for establishing the conditions for insurance.

The Ukrainian Law is an example of a very general law in the evolution that blends the institutions inherited from the Soviet period with the implementation of international obligations and the potential growth of private activity. In this context, a number of institutions are in charge of licensing and safety, a certification but no regime has been created for new concepts such as liability, and insurance is regulated by other national laws.

2.3. Other Countries

Australia

In 1998 Australia adopted the 1998 Space Activities Act⁴³ aimed at providing legal certainty and a predictable environment for the development and operation of Australian Space Launch Facilities.

The Act forms the principal part of the regulatory framework of private launch activities and was adopted as the consequence of the growth of international commercial launch services. Attracted by the combination of an exceptional geographical location and high technical expertise as well as a long standing tradition in telemetry and tracking in cooperation with the US, commercial operations agreements and projects for launch consortia emerged in the late 1990's in Australia. In response to this private sector interest the Australian Government enacted in 1998 the Space Activities Act.⁴⁴

The Australian Act has created a complex licensing system. It provides for authorisation in more than four categories of operations including Overseas Launch Certificates, Authorisations of Return and Exemption Certificates. For launches from national territory, the Australian Act provides for a

⁴³ Space activities Act 1998. Act No. 123 of 198 as amended. An Act about Space Activities and for Related Purposes.

⁴⁴ Freeland, Steven. "When laws are not enough, the stalled development of an Australian space launch industry." University of Western Sidney Law Review 2004 vol 4. 18 Jul 2009 <http://www.austlii.edu.au/au/journals/UWSLRev/2004/4.html#Footnote>

double licensing method based on space licences and space permits. Each space licence is granted by the Government to cover a particular launch facility, a particular kind of launch vehicle and particular flight paths and is a prerequisite for the grant of launch permits, which are required for a specific launch or series of launches of the same or similar payloads as well as returns.

Only commercial space launches not threatening Australia's national security, foreign policy, or international obligations are granted authorisation. To this end, the operator must demonstrate a set of conditions that are detailed in the accompanying Regulation of 2001. Among others, the operator will have to demonstrate that the launch involves the lowest practicable risk within the bounds of reasonable⁴⁵ cost and that the launch vehicle is effective and safe for its intended purpose.⁴⁶ In addition, the operator must obtain all necessary environmental approvals and fulfil all financial guarantees. Operators must also be insured; to this end the Act obliges that insurance be calculated according to the maximum probable loss up to a lump sum of AUD \$750 million. To this end the Space Licensing and Safety Office (SLASO) was created.

Launch activities will be supervised throughout their life by the Launch Safety Officer who is authorised by the government to supervise the launch operations and the launch site and give directions concerning the launch/return and also order search and seizure in cases of possible urgency.

The Act imposes liability on the launch operator for damage caused to third parties as prescribed by Art VII OST and qualifies this obligation by limiting the operator liability to the amount insured with any excess amount up to AUD\$3 billion to be payable by the government if the third party is an Australian National. In this case, if the damage exceeds the AUD\$3billion amount no further compensation will be payable. However the Governmental contribution only applies to Australian nationals. Consequently, in the case of a claim brought overseas, the launch operator is entirely liable for the entire

amount unless the claim is brought before an Australian Court.

The Australian Space Activities Act is the most detailed of the existing space laws. It categorises with great detail the different types of space launches and regulates authorisation and control schemes adapted to each type. It also presents other particularities such as the creation of the Launch Safety Officer for each operation and a liability regime shaped after the US model.

US

Contrary to other legal regimes which regulate space activities through a single document on space activities, these are comprehensively regulated in the US through a body of legislation targeting communication satellites, remote sensing and commercial launches.⁴⁷

The Commercial Space Launch Act⁴⁸ (CSLA) adopted as early as 30 October 1984 is perhaps the act that most resembles other Space Activities Acts. The CSLA has been the model or inspiration for many of the existing national laws on space activities. Acts such as the Australian Act have openly been inspired by CSLA and other more recent laws such as the Netherlands Act or the French SOA have included mechanisms similar to those of the CSLA regarding insurance and liability.

The CSLA was directly and comprehensively aimed at the prospective and desired involvement of the US private sector in space operations. Until the 1980's, the US had no specific agency to regulate the activities of private launch operators. Launch activities fell under the competence of NASA or the Department of Defense (DoD) and the first commercial launch applications were faced with cumbersome processes. Thus in 1984 the CSLA was passed creating a clear framework for authorisation and liability matters.

The CSLA responds to the growing globalization in the space industry with an increasingly international supply and demand for launch services and related financial and insurance services. The Act was drafted with

⁴⁵ The maximum probable loss methodology has been a edited by SLASO for determining the risks and potential consequences of launch accidents. 15 Jul 2009 http://www.innovation.gov.au/General/MEC-SLASO/Documents/MPLmethodology10702_Sept04_20050602113641.pdf

⁴⁶ Flight Safety Code, SLASO. 15 Jul 2009 http://www.innovation.gov.au/General/MEC-SLASO/Documents/FSC_Pubn1_20050602105043.pdf

⁴⁷ Most recently, on February 4, 2009 a bill, incorporating laws enacted in the 110th Congress, was delivered to the Committee on the Judiciary of the United States House of Representatives with the requirement to engage in a positive law codification process for the creation of Federal Statute that would reorganise and restate all existing space related laws in a sole instrument of statutory relevance.

⁴⁸ 49 USC Chapter 701- Commercial Space Launch Activities



the express purpose to develop commercial activity and maintain an internationally competitive position. To this aim, the Act seeks to encourage private sector activities and is drafted within the spirit of limiting regulation only to the extent necessary to protect public health and safety, safety of property, and the national security and foreign policy interests of the US.

In this context, an authorisation mechanism is aimed at encouraging and facilitating commercial space launches by the private sector and the involvement of private actors in the commercial sector. The Federal Aviation Administration (FAA) administers the licensing programme and has the authority to licence any person conducting commercial launch activities within US territory or launch activities conducted by US nationals in a foreign jurisdiction.

The FAA may issue two types of authorisations: a launch-specific licence and a launch operator licence. The launch – specific licence authorizes a licensee to conduct one or more launches, having the same launch parameters, of one type of launch vehicle from one launch site. The licence expires upon completion of all launches authorized or the expiration date stated in the licence. On the other hand, the launch operator licence authorizes a licensee to conduct launches from one launch site, within a range of parameters, of launch vehicles from the same family of vehicles transporting specified classes of payloads. The licence expires after 5 years.

During the licensing procedures the FAA conducts a review to ensure that the operation does not pose a threat to US national security or foreign policy interests and complies with international obligations. On the other hand, the licensee must provide analysis and economic parameters to demonstrate that the commercial launch does not pose a threat to the public and the FAA reviews the payload proposed for launch.

All commercial licensees must demonstrate financial responsibility to pay compensation for damages caused to third parties according to the principle of maximum probable loss determination. However, the licensee will only be held liable up to a statutory ceiling coinciding with the insurance to be purchased by the licensee. For damages above the statutory ceiling, the government provides indemnification for third party damages. Finally, the provisions on financial responsibility determination foresee statutory risk sharing by which each party involved in the commercial launch activity is only held

responsible and liable for its part in the activity.

The FAA has the authority to monitor the compliance with FAA regulations and the terms of the licence. In case of non compliance, the licence can be suspended or revoked and, depending on the infraction, the licensee may also be subject to a civil penalty.

As mentioned at the beginning of this section, US space law is not only limited to the US Commercial Launch Act, regulating Launch, Earth Observation, Satellite Navigation and Satellite Telecommunications. US space law is wide and has a longstanding tradition. The preamble of the Commercial Launch Act already clearly states the aim of the act is to support industry and private activities and it adopts a practical approach responding directly to the needs of the industry. In this regard, the US Commercial Launch Act has adopted a liability regime which incorporates the principles of “maximum probable loss” and risk sharing as well as a statutory ceiling and the so called state warranty, and has set a precedent after which many other space regimes have been modelled.

South Africa

The South African Space Affairs Act⁴⁹ (South African Act) was assented to on 23 June 1993 providing for the establishment of the South African Council for Space Affairs. In laying down the basis for the functioning of the Council, the South African act deals with the fulfilment of South Africa’s international obligations under the Outer Space treaties.

The South African Act was born as the consequence of a turbulent political landscape in the early 1990’s. When all other components of the nuclear programme were closed, space fell into a governmental vacuum that led the prime contractor, Howteq, to shift the programme’s military orientation to an explicitly commercial one. The Act was then adopted with the purpose of formalizing adherence to international obligations and providing for the structures and liabilities of the future space activities of South Africa.

According to the Act, no space activity shall be carried out without a licence, which is to be issued by the Council. While empowered to issue licences, the Council also holds the competence to determine conditions for each

⁴⁹ Space Affairs Act (Act No 84 of 1993), as amended by the Space Affairs Amendment Act, (Act No 64 of 6 1995).

particular licence taking into account safety standards, the national interests and the international obligations and responsibilities of the Republic. The elaboration of safety standards is also a competence of the Council.

The Council not only conducts *a priori* evaluations but is also in charge of *a posteriori* control by being empowered to conduct investigations. If the Council finds that the conditions of the licence were violated the Council may revoke the licence. Other sanctions include liability on conviction to a fine not exceeding Rand 1 million or to imprisonment not exceeding 10 years for non-compliance with the licence conditions.

The Act foresees that the Council may also include conditions on insurance and liability when establishing the licence conditions. At this stage the Council may decide on limitation of liability as well as on the conditions to determine the damage.

In conclusion, by creating the South African Space Council, the South African Space Activities Act creates a mechanism whereby a sole body is in charge of all space activities, from setting national programmes to granting licences to private operators. The Act confers ample facultative powers to the Council in terms of setting safety standards as well as control mechanisms.⁵⁰

Comparable to Ukraine, the South African Law is an all-embracing law which aims at setting the framework for all space activities in South Africa. However, it differs from the Ukrainian regime in that it addresses private activities by creating a licensing regime, a control regime that foresees sanctions for the non-fulfilment of international obligations, and liability is directly addressed by empowering the Council to decide on suitable conditions in each case.

2.4. A Comparative Examination

A brief look at the subsections above reveals a wide variety among the different national regimes. However, among their principles all of them incorporate the aim of implementing the international obligations on space affairs to which they are signatories. This is

reflected in a set of common elements ("building blocks") according to which the laws are laid down in a more or less explicit manner.

A significant point of difference consists on the level of exhaustion in which such elements are regulated with regards to the conditions and obligations laid down, and the designation of authorities and their competencies. Although authorisation mechanisms show a certain degree of similarity⁵¹, i.e. the issuance of authorisation most frequently falls to the Ministry in charge of space matters but this is not the case for the required guarantees. While all laws stipulate accordance with national security interests, public health, international obligations and with environmental standards, some countries leave the assessment entirely on a case-by-case basis (e.g. Sweden and Norway); others such as the Netherlands and the UK are satisfied with establishing a framework to be fine-tuned according to the specific operators; and others such as France or Belgium with respect to environmental guarantees envisage the adoption of detailed decrees.

A posteriori control mechanisms are not an exception to the differing approaches. Also common is that countries with launching facilities have appointed *ad hoc* institutions for the supervision of launching sites and launch operations - a clear example is the appointment of Launch Officers under the Australian Act. In general, an open clause allocates this competence to the ministry in charge of space affairs which is likely to be conditioned by internal competence factors and the available expert knowledge when attributing control competences.

Equally, liability regulations show a wide variety of combinations: from *a priori* unlimited liability qualified by a mere exception based on "special reasons", to the sophisticated US liability regime which creates the "maximum possible loss" criterion regarding insurance, establishes it as a liability cap and incorporates state warranty and cross waivers. Most liability regimes have in one or another way provided an escape clause which could allow the authorities in charge to adopt similar conditions and often they have emulated the US system, e.g. the Netherlands and Australia have incorporated

⁵⁰ Von der Dunk, Frans. Private Enterprise and Public Interest in the European "Spacescape": Towards a National Space Legislation for Private space Activities in Europe. Leiden 1998. 152.

⁵¹ Marboe, Irmgard. "Brief overview of national authorisation mechanisms in implementation of the UN international space treaties" ECLS Practitioners Forum 2008. National space legislation in Europe-Issues of authorisation in the light of developments in European space cooperation. ESA Headquarters, Paris, 15 Dec 2008.



“the maximum possible loss” principle and France has even incorporated a state warranty mechanism.

Despite the disparities, some common features can be observed among European countries, mainly: all European space laws target private activities and aim at creating the institutional and legal framework by addressing space operations and not only launches (Australia) or also the national space programme (Ukraine). Yet the differences are obvious: some laws aim only at implementing international obligations through national law as the consequence of dualism; some others aim at the creation of a legal basis for prospective activities; and the

French Law encapsulates its long standing practice in a an attempt to adapt it to the purely commercial environment.

The diverging approaches are the consequence of the level of development and the type of commercial activities in each country. While the laws respond to the concrete needs of their economies, they are shaped by the specificities of the national legal system and institutional bureaucracies. In this regard it is still striking that countries with a strong space sector such as Germany and Italy, still have not passed their national space laws.

3. Effects of Space Legislation on the Commercial Sector

While international treaties are generally only binding for states and do not oblige individuals *per se*, States can be held responsible for the compliance with international obligations by individuals. Most states then need to adopt implementing legislation at national level in order to ensure compliance with international obligations by their nationals.

In abiding by national laws, individuals will have to accommodate their activities to the existing law. As was mentioned in the previous chapter, national laws differ in content and procedures creating a first level of divergences but, further, there is a second level of divergence between those countries who have passed implementing laws and those who have not. These two levels of divergences are translated into substantial discrepancies in the particular regulatory environment concerning each operator.

Such regulatory environments shape the culture of operators. Each main European Satellite operator is subject to a different regulatory environment. Hellasat in Greece, Hispasat in Spain and SES in Luxembourg are not subject to space legislations, Immarsat in the UK or Eutelsat in France are subject to space legislations that differ significantly in their philosophies. Not two operators are subject to the same regulatory framework; therefore the workings of operators are differently shaped. The routine of the operators at the commercial level and also at the level of satellite optimisation and launch procurement (and the prospect to access space in a well defined and time secured manner) is strongly conditioned by the applicable legislation. A fragmented legislative landscape in the European level threatens to impact the way satellite operators are structured and organised and the way space operators are located throughout Europe.

Going further into the contents of space legislations, Space Treaties create a series of obligations comprising authorisation, control, registration and liability. When these obligations are shaped by national laws they

are translated into an array of bureaucratic procedures, technical checks and financial requirements that may cause a burden on private actors or, to the contrary, even ease burdens that the lack of a legal framework may involve (as it is with liability). Although this can be said for any other national law whether implementing international obligations or constitutional obligations, such differences are especially relevant in a global market such as space where operators have international presence and provide transnational services and thus may have more manoeuvring space to shift their operations towards the one or the other jurisdiction.

The investigation carried out during the preparation of this report has indicated that authorisation issues together with technical checks are amongst those obligations which form the major concern of commercial operators, with insurance and liability issues occupying a very relevant position. Registration of space objects is one of the most relevant obligations with the Convention on Registration of Objects Launched into Outer Space elaborating on the registration regime. There has been much discussion on the relevance of registration and the determination of jurisdiction thereof. However, the aim of the study is not to look into questions of applicable law but to look into the potential effects of such laws, once the law is applicable, as factors that may condition business plans and relations with commercial operators.

The following section deals with elements of authorisation, technical checks, and liability and insurance matters. In so doing, the following subsections will try to not only highlight the issues involved in each of those elements but also the challenges they pose to legislators and the effects on the behaviour of commercial operators from the perspective of the causes and consequences of more or less flexible laws.



3.1. Authorisation: Types, Conditions and Assessment

As demonstrated in the previous analysis, the obligation to grant authorisation to non-governmental entities has been implemented with great heterogeneity. Although common features can be found in all legislations, such as the requirement for certain guarantees to be assessed by the authorities, the type of authorisation to be granted, the list of conditions to be fulfilled or the authorities in charge of an *a priori* assessment are not defined with equal detail in all laws. In this sense, even the content an authorisation may differ from one legal regime to another. Given the particular background of non-governmental activities, different modalities of authorisations have been adopted. While operators may be faced with a complex range of requirements and modalities to be adapted to their particular guarantees and the specificities of their operations, the same is not applicable in countries with a lower commercial tradition where operators are faced with an uncertain case by case type of authorisation without pre-established conditions. The relevance of the type of authorisation to be granted is based on how much a type of authorisation can be adapted to the commercial situation of operators.

Equally, operators may be faced with only the knowledge of who is the issuing institution. National legislators have not always been capable of creating or appointing *ad hoc* bodies charged with assessment and have instead provided for the creation of *ad hoc* expert groups to assist the government or the minister. Together with very open formulations of the guarantees to be fulfilled by the operator, flexible systems can be interpreted as either best suited to the specificities of the operators or as generators of legal uncertainty. Very few regimes, such as in France, include the elaboration of detailed regulations and the *ex ante* allocation of assessment competences.

The obligation to authorize space activities stems from the need for preventing and managing damages they may cause. Although all regimes are grounded on the common basis that every space activity must respect national security, public health and safety of property and persons, not all regimes seem to come to the same level of definition of safety and security standards. National legislators may develop independent safety standards or incorporate or refer to

private standards for safety assessment. However such standards must carefully be chosen as industry and operators already adhere to certain industrial standards that may raise compatibility issues⁵². Insurance requirements are a pivotal element in the assessment of financial guarantees - if technical standards aim at the prevention of damages, insurance guarantees aim at ensuring that the private operator will be capable of covering the damages caused by a space accident. Strongly linked to third party liability obligations, laws tend to require insurance coverage which, linked to third party liability, has caused much distress among insurers. The expectation to cover the full damages of a space accident may clearly exceed the financial capacity of any private insurer which may lead to the refusal to offer coverage to space operators. Many legislators have come up with formulas such as the "maximum possible loss" or the accordance of the insurance market. However, other regimes have kept insurance requirements in an unclear discretion of the authorities⁵³.

3.1.1. The drivers at institutional level (causes and expected consequences)

Whatever the degree of exhaustion conceded by a law, all regimes provide for a certain margin of discretion to national authorities as it is in the interest of national authorities to have some flexibility for assessment. Space activities are not characterized for mass production and each activity is distinguished by its differential particularities. Equally, operators differ from each other in offering different degrees of guarantee. Therefore, it is crucial for national authorities to enjoy a certain margin in order to be able to apply different levels of assessment to different operators.

Flexible regimes are characteristic of countries such as Sweden, the Netherlands or Belgium, which have to strong space activity but so far this has only been developed in the framework of public programmes and academic purposes. Both the Netherlands and Belgium enjoy a strong international tradition; one as the host of numerous international institutions and the second as

⁵² According to the frameworks created by the French Space Operations Act, Technical regulations will be developed by CNES in accordance with ESA standards. UNCOUOS legal subcommittee 2009. Link

⁵³ Close, Roger. "UK Outer Space Act 1986: Scope and Implementation." "Project 2001" – Legal Framework for the Commercial Use of Outer Space. Ed. Karl-Heinz Böckstiegel. Köln: Carl Heymanns, 2002. 587-589.

host of the European Institutions and a centre of international industrial representation; and both are experiencing a growth in space activities.⁵⁴ In anticipation of potential future commercial developments⁵⁵ and consequent responsibility under the UN outer space treaties, both countries have adopted legal frameworks for space activities.

In this context, the national authorities still have not been able to acquire the expertise or the experience to be able to lay down *ex ante* technical requirements to grant authorisation. This, coupled with the expectation of a low intensity of commercial applications in the near future, has allowed legislators to provide for wide frameworks whereby *ad hoc* expert committees can be set up per operation and provide thorough analysis to small operators that at the outset may find it more difficult to comply with safety and financial guarantees. It is also believed that a thorough regulation may create a straight-jacket which may not be able to provide adequate solutions for small operators in particular with regards to insurance arrangements or even new activities such as space tourism.

Although the majority of space faring countries in Europe are small countries in terms of space capacity, this is not the case with France, which is considered a space power and owns one of the best located spaceports in Kourou. The commercial landscape in France is far more developed than in other European countries: it has been a host since early times of a launch operator, a satellite operator and a space industry. From the beginning, the aim of the government has been to create a basis that will support commercial development in space. With a visible managing structure comprised of CNES, the government has always been capable of ensuring the compliance of commercial activities with national interests and international obligations through a mix of general national

laws and international laws.⁵⁶ However, the birth of commercial activities that would be completely detached from public activities created the so called French paradox, whereby the country with the strongest space industry lacked the legal means to administer its commercial activities. The main challenge, therefore, was to create a legal framework capable of blending with existing contractual practices and other technical and financial regulations in order to ensure legal certainty and compliance with international obligations and national interests. The result is a well-informed exhaustive law which builds on existing experience and provides a detailed legal framework of technical obligations. The expertise already exists in house for the creation of dedicated laws and standards and, equally, the assessment mechanisms and authorities already exist with an experienced space agency for technical assessment.

3.1.2. Consequences for private actors

Irrespective of whether authorisation is done on an *ad hoc* basis authorisation or through well-defined modalities of authorisation, the governmental authority must be able to assess each case according to its specificities and issue licences or authorisations accordingly. It must be borne in mind that the legislator in countries with open framework laws wants the flexibility to be able to adapt the proceedings to each case. An particularly relevant point here is that since it lacks the in-house expertise it may rely on the already well-established name of the most emblematic companies creating entry barriers for smaller new companies whose reliability is not backed by a long tradition.

Discretion is, however, not a characteristic of flexible regimes but also plays a role in exhaustive regimes that have created systems of sole permits and long duration licences to be allocated to different cases according to the specificities of the operation or the operator. This system allows the adaptation of an otherwise transparent and strict regime. As has already been explained before, the type of authorisations and procedures mirror the practices carried out actually in the context of real commercial activities. In this sense, there is a fear from industry that authorities could tend to favour national operators and industries with whom they are already familiar.

⁵⁴ Supra 32. and Mayence, Jean-François "Harmonisation of Authorisation Regimes in space Activities" ECLS Practitioners Forum 2008. National space legislation in Europe-Issues of authorisation in the light of developments in European space cooperation. ESA Headquarters, Paris, 15 Dec 2008. Also agenda item on "National legislation relevant to the peaceful exploration and use of outer space" COPUOS Legal Subcommittee. Mar 2009.

⁵⁵ In the case of Belgium the potential liability rising from its activities in the ESA Space Center Redu in the South of Belgium. In the case of Sweden the rapid development of Kiruna Spaceport as Spaceport for space tourism could also arise similar concerns of liability.

⁵⁶ Pour un Politique Juridique des Activités Spatiales. Conseil d'État. Paris: La Documentation Française 2006.50-62



One scenario where this could happen is that where the national authority ties applicant operators to national industry or launch service providers. National authorities may tie operators to national industry and service providers by refusing authorisation on grounds of security or safety when they opt for foreign providers. Operators may also simply be denied a licence and be subject to assessment per launch in cases where they do not contract with national industry and service providers. State warranty proves also to be a strong tool to protect national industry and launch providers, by denying state warranty to operators, the latter maybe forced to contract with national actors in order to be able to obtain state warranty coverage.

Satellite operators abide by criteria of reliability and competitive servicing at the time of choosing one or other launch service provider. If obliged to launch with a certain launcher or obliged to undergo cumbersome administrative burdens, or denied state warranty, satellite operators are placed at a competitive disadvantage with competitors as launching with other launchers or contracting with other manufacturers might often be less costly. In addition, those satellite operators needing *ad hoc* authorisations may be delayed in their business plans and incapable of making commitments for competitive services to clients. At last, operators tied to one launch operator are obliged to rely on only one launch operator and are left without any alternative resource in case of failure to launch.

A second set of questions may emerge at the level of technical assessment as the application of certain standards strongly affects the costs involved in design and construction. On the one hand, the adoption of the traditionally or most widely applied standards may reduce costs as it is likely that operators already abide by such standards. The assessment procedure is not only faster and less costly but also operators do not need to incur additional costs in redesigning their crafts and possibly the services to be offered. Further effects related to standards are to be found in the fact that by adopting certain standards national authorities are capable of protecting national manufacturing industries and creating barriers for new entries. Moreover, national authorities may opt for standards that render launching services unattractive to operators.

Finally, insurance matters may seriously affect the financial capacity of operators as insurance is usually required to cover the entire life-cycle of an operation. An insurance

regime equally applicable to space activities of completely different characteristics may cause undesirable consequences. While the duration of a launch lasts a relatively short time and the entire process of operations is not prolonged longer than days, the life of a satellite may reach up to twenty years and with it operations can last as long as such a period. The insurance for such a long period of time undoubtedly surpasses that of the launch causing a high financial burden on satellite operators.

3.2. Liability

As mentioned before, authorisation is closely linked to control and liability sharing as it sets the jurisdiction for carrying out control as well as for risk sharing and liability allocation.

In providing for liability for damages caused by space activities, the Outer Space Treaty together with the Liability Convention take a victim oriented approach whereby victims of damages caused by space accidents who are not related to the space activity must be compensated for the full damage. In order to provide the widest protection possible to the victims of space accidents, the Outer Space Treaties charge States with the liability for space activities since the State is much more reliable and solvent than any private entity. Holding States liable may be the most protective measure for potential victims⁵⁷ since States may be the only entities able to cover the vast liability implied by the Outer Space Treaties that establish unlimited and absolute⁵⁸ liability towards third parties. The liability is also unlimited in time as it covers damages caused during launch, the entire period in orbit and the time after termination of the space activity. In this sense, the liability can still be alive even as long as centuries after the space operation is over.

However, Art. VI OST establishes that States are not only liable for governmental activities but also for space activities carried out by non-governmental entities. Coupled to this obligation is also the power of the State to

⁵⁷ Kerrest, Arnel. "Liability for Damage Caused by Space Activities". *Space Law: Current Problems and Perspectives for Future Regulation*. Eds. Marietta Benkö and Kai-Uwe Schrogl. Utrecht: Eleven International Publishing, 2005. 91-112.

⁵⁸ *Ibid.* The Liability Convention establishes an absolute liability in the case of damages caused on Earth as the liability is without a fault and it might be interpreted that no exonerations is possible as this is not foreseen in the wording of the text.

receive compensation from the non-governmental entity for the amount paid.

It has already been pointed out that state liability is unlimited and absolute⁵⁹. The unlimited and absolute character of space liability acquires a particularly wide character when the risks of space activities are taken into account. The nature of launch activities and of the preparation of satellites for launch makes them highly hazardous activities. It might be argued that a higher investment to enhance reliability of space activities could involve lower liability, however, beyond a certain point such investments could result in costs totally disproportionate to the gained reliability and, therefore, the current risk level is accepted.⁶⁰

In sum, private entities might be obliged to compensate for amounts much beyond their financial capacity and even beyond the financial capacity of the insurance market which may refuse to cover space activities. An added issue is that victims may be able to claim compensation via the general domestic damage claim procedures or by invoking the Liability Convention. In this sense it might be difficult for the State to get compensation under domestic rules if there are no special stipulations in national space law or in the licence agreement.⁶¹

Traditionally these issues have been regulated through the launch contracts and state coverage of liability ensured by the participation through share holding of state agencies in launch activities⁶², and issues related to insurance have been agreed on a contractual basis for the cross-waiver arrangements.

⁵⁹ However, it must be pointed out that although liability is unlimited for damages caused on Earth, air and on outer space, it must be pointed out that damages caused on Earth or air are subject to strict liability while damages caused by accidents in outer space are subject to fault. Art III LIAB.

⁶⁰ Du Parquet, Claude-Alain. "Launch Services Agreement and Inter Party Waiver of Liability." Towards a Harmonised Approach for National Space Legislation in Europe. Eds. Stephan Hobe, Bernhard Schmidt-Tedd, Kai-Uwe Schrogl. Towards a Harmonised Approach for National Space Legislation in Europe. Köln: 2004. 129-134.

⁶¹ Kerrest, Arnel. Purpose and Modes of State Indemnification. Eds. Stephan Hobe, Bernhard Schmidt-Tedd, Kai-Uwe Schrogl. Towards a Harmonised Approach for National Space Legislation in Europe. Köln: 2004. 121-128.

⁶² E.g. in the case of Arianespace Art. IV of the Ariane Declaration provides that in case of claim placed by victims for damage caused by any Ariane launch, the French Government will bear the financial burden of the compensation for such damage. When the French Government has been called for compensation for damages, Arianespace has to reimburse for the amount.

Building on pre-established practices, governments that have adopted national laws have made an effort to incorporate mechanisms that will ease the burdens of liability. In broad terms, the adopted mechanisms are embedded liability caps, state warranty measures providing for state support in order to cover all damages, and cross waiver provisions aimed at ensuring the insurance market will be able to cover risks from space activities.

3.2.1. The institutional approach

Similar to authorisation systems, liability regimes have evolved in response to the commercial evolution of space activities. To the extent that states without launching facilities and without commercial space activities can be held to be launching states in the case of commercial launches, they have incorporated provisions on liability emulating those mechanisms instituted by space powers with developed commercial launch activities e.g. the US and France.

In the 1980's, both countries were faced with increasing space commercialization and the need to develop a regulatory environment that would allow operators to develop commercial activities without the constraints of a burdensome regulatory framework. Both the US and France developed in a somewhat different manner. While Arianespace in Europe was being privatized and left subject to French jurisdiction (that lacked a space law) under the Reagan Administration in 1984 the US passed the CSLA. This incorporated the "National Security Decision Directive (NSDD-94) "Commercialisation of Expandable Launch Vehicles" (ELVs) which envisaged the commercialization of space activities while also providing for the obligation to obtain insurance to cover loss of or damage to US government-owned systems as well as insurance for third party liability. Launch operators were left the entire burden of an unlimited liability that although unlikely to occur would amount to the bankruptcy of the company in case of a catastrophe.

Meanwhile, Arianespace in Europe had been privatized under French Law and certain provisions were incorporated into its Founding Declaration⁶³ which set a cap on the liability required from Arianespace and made arrangements for government indemnification above that cap. In addition, Arianespace developed standardized clauses introducing cross-waivers of liability whereby

⁶³ Declaration by Certain European Governments Relating to the Ariane Launcher Production Phase, 14 April 1980.



it undertakes not to bring claims against its contractors under the condition of flow-down of this waiver into the subcontractors. The cross-waiver clauses are also applicable to customers.

The competitive difference between the two systems - the US system allocating unlimited liability to commercial operators and the European system providing for limited liability - raised concerns among US operators who were afraid that they might not find appropriate insurance coverage and would be placed at a competitive disadvantage. In response to this situation, the CSLA was amended in 1988 introducing several changes such as a ceiling, the state warranty and the concepts of the maximum probable loss and the maximum liability insurance available on the world market.

Although it has been believed that the French liability framework comprised of the liability cap determined in the Ariespace Founding Declaration together with the state warranty foreseen by the Declaration and the standardized cross-waiver clauses, is a flexible and favourable framework for the development of commercial activities, the recent French Act on Space Operations dedicates a chapter to liability which contains the legal basis for all liability mechanisms developed in the context of Ariespace launches.

Currently liability regimes present the following elements:

- Limitation of the non-governmental entity's liability towards third parties.

In order to avoid the consequences of charging non-governmental entities with unlimited liability legislators have devised several ways to limit the liability of such entities. In some cases the legislator determines a blunt amount up to which the non-governmental entity will be required to reimburse the State. In others, the cap may be established according to the insurance available in the market. A third scenario would be where the licensing authority determines the maximum probable loss while setting it as the ceiling up to which the company is obliged to be insured and will have to pay in case of accident. A combination of several of these options is also possible as in the case of Sec 70112 CSLA whereby the licensee needs to acquire insurance or demonstrate financial responsibility up to the maximum probable loss. In any case, the licensee will not be obliged to reimburse the State over the blunt amount of \$500million, an amount that can

be limited by the Secretary according to the maximum liability insurance available in the market.

- State warranty/State indemnification

The liability ceiling may be coupled with the so-called State warranty/State indemnification which consists of the State covering the damages over the ceiling. According to the CSLA, the US government will pay for "a claim finally decided by a court of competent jurisdiction." On the contrary, the French law does not limit the state warranty.

- Cross-waivers of liability.

Cross waivers of liability have been commonly contained in launch agreements and are an essential part of them. They are based on the principle that each party must be held liable only for its share of responsibility. Cross-waivers consist of parties agreeing to a mutual no-fault no-subrogation inter-party waiver of liability between the launch provider and its customers and associates, the manufacturers of the vehicle and the satellite, and the financial entities. Cross-waiver provisions are associated with a "hold harmless" clause by which each party undertakes to pass over the said cross waiver obligations to its associates and interested parties, and to guarantee and hold the other party and its associates harmless in the event that its own associates or interested parties should claim for damages from the other party or associates.

3.2.2. Private actors' approach

Due to their complexity and the high investment they involve, the development of space technologies cannot offer levels of reliability already achieved by other industrial sectors. The industry observes that higher investments for enhancing reliability of space technologies would amount to costs that would be nearly unbearable and the results would hardly outweigh investment.

Therefore as it stands now, space technologies must involve a certain degree of risk, which in the case of space has the particularity of being an unlikely risk that if materialized can cause unimaginable damages. In this regard the passing of State liability onto non-governmental operators places a heavy burden on them as they need to be insured for the entire liability they must hold. The reform of the CSLA made this clear when launch operators were concerned about the finance market not being able to cover such risks and, in any case, about the high

premiums they would have to bear in order to be insured. Private operators felt they were “betting the company” per launch and asked for a law that would provide for liability ceilings and state indemnities.

Currently, the state indemnification is being put to the test in the US. Launch operators have expressed their concerns about the possibility of reform or the abolition of the state warranty. State warranty has become an international standard and the removal of such a measure would be considered a “market killer” because the system that removed state warranty would not offer the level of insurance that others do and would be placed at a competitive disadvantage. On the other hand, the state warranty plays an important role in outweighing other regulatory barriers such as those posed by export control regulations.

However, the existence of a law is not so important as the existence of workable and practical liability mechanisms. Before the Space Operations Act was passed in France, the industry had already elaborated cross-waiver mechanisms on a contractual basis. This system was regarded as flexible but reliable and capable of adapting to new contracts but also providing legal certainty for newcomers. Although not regarded as necessary, the adoption of a law may allow a level playing field with regard to countries that offer a state warranty in legislative form.

It has been mentioned above that the laws on liability have been developed as the consequence of the practices of states with launching capacities. Therefore, the liability regimes mirror the specificities of launch operators and run the risk of not being adapted correctly to satellite operators. This may be the example of the French Space Operations Act that only foresees liability limits and state warranty for damages caused on earth or in the air. Damages in orbit are not subject to the same measures but yet need to be authorized and need to comply with insurance obligations. The risks of damages caused by the operation of in orbit satellites is considerably smaller than the risk involved by launch activities, given the long life of a satellite, insurance for unlimited liability seems disproportionate.

3.3. Conclusions

When implementing international obligations, national space laws pay attention to the actual and the prospective development of national commercial space activities. Equally,

the formulation of authorisation conditions and the creation of governmental services to that end as well as the regulation of liability depend on the available expertise. All of these factors lead to a variable degree of discretion conferred to national authorities across the different jurisdictions. It would seem that while favoured by certain national authorities, flexibility could be regarded as a factor of legal uncertainty and potentially discriminatory. Commercial operators may therefore favour more detailed legal frameworks that may provide legal certainty.

However, due to the fact that the conditions laid down by laws are based on existing commercial practice, it may well be that by stringent regulations, authorities may be rubberstamping the practices of certain private operators and in this way favouring national operators. Technical regulations may often be so narrow that they limit licensees in their freedom to choose their providers and partners. A second level of concern is attached to the fact that in some countries space laws may be enacted after commercial space activities have developed to certain extent, as has been the case of France or maybe the case of countries such as Italy, Germany or Spain. In such cases the fact that a law is adopted is already a source of uncertainty since previous to the adoption of the law operators would launch solely according to their own commercial commitments whereas after the law has been adopted operators may not be sure about being granted authorisation.

Similarly, in principle, the inclusion of provisions limiting liability of commercial operators is positively regarded. The inclusion of cross waiver mechanisms and state warranties creates attractive conditions for operators. It therefore supports the proliferation of space activities and a competitive environment by easing the burdens for national commercial operators and also by attracting foreign operators to launch with national launch service providers. Such provisions often the mirror of launch contract clauses adapted to the usual operators. If such causes are mirrored in the national laws without care, they could even be a deterrent to newcomers. On the other hand, a flexible formulation of liability limits and the omission of every reference to state warranties creates disparities among countries and therefore competitive disadvantages.

It is claimed that state warranties support national commercial space activities. It is this very fact that has been put in the spotlight of state aid regulations. While it does not seem



to have raised issues in the context of the WTO, the French Act was submitted to the EC Competition authority for assessment under EU State Aid rules. The state warranty mechanism was considered a state aid as it is selective, involves a direct transfer of resources from the State to the private operator, and may have an impact on competence. The aid was exempted however, as it is an appropriate, necessary and proportional measure for the achievement of Community objectives. In this analysis, the EC noted, inter alia, that the state warranty as set by the French law provides for legal certainty and provides for a licensing procedure equally open to all operators in the market and is, therefore, non discriminatory.

In this line, laws providing for clear-cut authorisation procedures that incorporate standardising regulations and limits to the operators' liability support the development of national space activities. Their inclusion in national legislation should not be seen however as providing competitive advantages, they should rather be seen as mechanisms to avoid competitive disadvantages in relation to other jurisdictions that also incorporate them.

4. Policy Recommendations for Europe

4.1. *The Need for Harmonization of Space Laws*

As we have seen above, despite the developments of the past decade in the regulatory area, or perhaps because such developments have taken place disconnected from one another, the space sector faces severe inconsistencies at regulatory level that have nourished market deficiencies. It seems, therefore, that common regulatory conditions are desirable in order to bring space legislation into shape and provide for legal certainty and comparable conditions for operators in different countries.⁶⁴

Ideally, such coherence would be attained at international level, however, the current international legislative setting does not seem to facilitate any approximation of national laws at international level. The space treaties do not deal with aspects of private law and efforts for the creation of private law models are still in the draft stage.⁶⁵ Formalisation into a more detailed international regime at the UN level seems unlikely, and development through the current international private law schemes does not seem suitable.⁶⁶

In this context, much emphasis has been placed on the capacity of the EU to create a coherent common legislative framework, through secondary law. The powers for harmonisation of the EU seem best suited for creating such a common legal framework that is able to encompass not only the entire range of regulatory fields, but also to provide the legal basis for the implementation of

international obligations at national level and the creation of administrative infrastructure to support the implementation of the law. A "European Space Law" would be capable of filling the gaps between national legislations.⁶⁷

The traditional approach to a potential European space law framework has turned around the idea of harmonisation of national legislations. However, a few questions need to be pointed out in this regard. Space laws implement international obligations that are binding on States. The European Union is not the addressee of such obligations but its Member States (MS) are. In this regard, the implementation of any space law at European level would need to take into account also the international obligations of its MS while providing for a scheme whereby they would still have responsibility for their space activities and could respond accordingly. A further question with respect to the creation of a European space law framework is related to harmonisation itself. It seems that the existence of national laws would be a prerequisite for harmonisation, but given the fact that only five MS have adopted national laws, it might be questionable whether harmonisation could take place in the space field in Europe.

On the contrary, it must be recalled that the current EC is founded on the removal of market barriers and free competition. However, where national laws are aimed at protecting interests recognized by the community, such as public health or national security, such barriers may still persist. Harmonisation is then the instrument whereby the EU creates common standards in order to reduce the risk of operators moving their bases to other countries in search of less constraining national legal frameworks.

⁶⁸ Regarding space activities, harmonisation becomes even more important given its capacity to contribute to the aims of the

⁶⁴ EC/ESA joint Task Force Secretariat, Green Paper on European Space policy, Report on the Consultation Process, BR-208, Oct 2003.

⁶⁵ The Unidroit Protocol on Space Assets is the major effort in the creation of a model law concerned with private space operations. Nevertheless, the protocol is rather limited in scope as it only deals with the jurisdictional aspect of liability matters.

⁶⁶ Hobe, Stephan. "Harmonisation of National Laws an Answer to the Phenomenon of Globalisation." "Project 2001"-Legal Framework for the Commercial use of Outer Space. Böckstiegel, Karl-Heinz. 2002 Köln./Berlin/München: Karl Heymanns Verlag, 2002. 551,552.

⁶⁷ Gerhard, Michael Kai-Uwe Schrogl, "Report of the „Project 2001 Working Group on National Space Legislation" "Project 2001"-Legal Framework for the Commercial use of Outer Space. Böckstiegel, Karl-Heinz. 2002 Köln./Berlin/München: Karl Heymanns Verlag, 2002. 549-552.

⁶⁸ Steiner, Josephine and Lorna Woods. EC Law. Oxford/New York: Oxford University Press:2003. 258-276.



Union. This is due to the fact that a competitive space sector does not only serve European strategic purposes such as independent access to space but also has the potential to contribute to an innovation based economy as pursued by the "Growth and Jobs Strategy." A coherent legal framework that eases financial burdens to commercial operators favours the shift of funds towards the improvement of space technologies and the optimisation of production.

All in all, the European Union has recently been provided with a European Space Policy that forms part of the space competence previewed by the Lisbon Treaty, a competence that already sets the basis for an EU wide action in space.

4.1.1. The European Space Policy

At the end of the 1970's it became evident that if European space industry was to be competitive in the global markets, the European Union would need to take active action in space in coordination with ESA while providing for a strategy that would facilitate the spill-over of space technology developments into other areas of the economy and provide society with the benefits of space technology based services. The increasing commercialization of space activities and the development of space law pushed the European institutions towards the first steps in the space field. Already in 1979 the European Parliament (EP) adopted a "Proposition for a Resolution on the Community's participation in space research"⁶⁹ and later, in 1981 the EP adopted a resolution on a "European Space Policy"⁷⁰ for the first time. The first reference to national space legislation appeared in 1987 when the EP urged the European Commission to contribute to the process of development and codification of space law in order to avoid a time consuming codification later on.⁷¹

Nevertheless real action towards a European space framework did not start until 1999 when two major events took place in the European Space environment. On the one hand, the European Commission officially announced the launch of the Galileo programme⁷² while, on the other hand, the

European Commission adopted a Communication⁷³ reporting on the joint reflection conducted by the European Commission and ESA. The document reflected the strategic and economic importance of space-technology-enabled services and applications while it raised awareness of the need for a coherent approach to space and the importance of creating a consultative structure with ESA. The document took account of the global switch towards a market based approach, the relevance of developing a competent industry capable of sustaining independent access to space and the need to create the conditions for an industry capable of competing worldwide. The lack of consensus in Europe that would allow the creation of such conditions raised the challenge of having to take an institutional and organizational approach at European level. Legislation was conferred a key role as more effective implementation of existing legislation was considered essential. The European Union was seen as the facilitator of the coordinated introduction of global systems regarding frequency management and authorisation conditions and procedures. The EU could conceive one-stop-shop organism for licensing and also use its power to obtain the adherence of MS to non-binding rules such as CEPT where Community policies were at stake. The strategy did not sketch out any concrete institutional structure nor a space policy. In early 2000, the ESA International Relations Committee made efforts in discussing national approaches and plans through holding a number of informal meetings. These efforts, however, did not lead to concrete accommodations but at least raised understanding of the respective positions and approaches.

That would happen at a later stage when the White Paper⁷⁴ was adopted in 2003. Although during the consultation process regulatory concerns were raised relating to standards and licensing issues, the White Paper elaborates on the contribution of space technologies and space based services to the several goals of the EU and contains only a mention of legislative matters when referring to the role of the EU in the elaboration "of proposals and representation of the EU

⁶⁹ Proposition for the Resolution of 25 April 1979 on the Community's participation in space research, OJ C 127 of 21.5.1979, p. 42.

⁷⁰ Resolution of 17 September 1981 on Europe's space policy, OJ C 260 of 12.10.1981, p. 102.

⁷¹ Resolution of 17 June 1987 on Europe's space policy, OJ C 190 of 20.07.1987, p. 78.

⁷² European Commission. Galileo- involving Europe in a new generation of satellite navigation services COM (1999)

54 final of 10 Feb. 1999 and European Commission . Communication on Galileo. COM (2000) 750 final of 22 Nov. 2000. Brussels.

⁷³ European Commission. Towards a coherent approach for Space. SEC (1999) 789 of 7 June 1999. Brussels.

⁷⁴ European Commission. White Paper on Space: A new European frontier for an expanding Union- An action plan for implementing the European Space Policy. COM (2003) 673 final. 11 Nov 2003. Brussels.

interests when addressing space law issues in international forums.”

The White Paper paved the way for the adoption of the European Space Policy (ESP) in 2007 and the ESP Communication dedicates a section to regulatory issues which affect mainly the market of space based services. Although the ESP Communication seems to have abandoned the concept of a coherent legislative context with the creation of common authorisation standards and a one-stop-shop authorisation procedure, the White Paper does mention that space is faced with high technological and financial risks but does not elaborate further on the provision of mechanisms to deal with materialized risks. The ESP provides the context in which activities are set and elaborates its interaction with other policies and its contribution to the Lisbon Strategy goals and the CFSP/ESDP. It does not elaborate much further on the institutional setting or on collaboration with ESA, but this might be explained by the fact that ESA-EC relation are already dealt with in the ESA-EC framework agreement. Also, the institutional arrangements at EU level will be better shaped after a clear space competence is awarded to the EU. Therefore it seems logical that the ESP must be seen as a piece of the jigsaw of European wide Space Policy.

4.1.2. Space and Innovation. A new strategic role for space in Europe?

Since the time of the Cold War, space has been viewed as a highly strategic sector for its content of critical technologies and its security component. With time, space-based infrastructures have become increasingly important as space technology based applications are integrated into every aspect of our lives. As already mentioned by the space strategy, what is at stake is the number of applications to be guaranteed by a competent European industry. The drafters of the White Paper saw this and drafted the document along the lines of the Lisbon Strategy striving for a knowledge based most competitive economy with strong emphasis on research and innovation. Space starts gaining strategic relevance as a potential catalyser of innovation and so the ESP selects space as the enabler of the partnership for growth and jobs as it offers a great scope for high technological innovation and opens the possibility for the development of lead markets.

The idea was further elaborated during the Informal European Council that took place in Kourou in June 2008 where space was once

again put in the context of the EU general strategy for growth and jobs. Accordingly, space is a horizontal policy with the capacity to enhance other strands of the EU policy, particularly innovation. Due to its intensive technology content, space fosters the creation of a high skilled workforce and has the capacity to spill over into other sectors. The nature of space activities makes them specially suited to the innovation aims of the Lisbon Strategy and embeds a combination of different technologies allowing innovative and competitive services. In addition, this sector is faced with strong international competition. The increase of commercial activities in space also indicates a high potential for growth and makes space extraordinarily well suited to be considered one of the lead markets within the Lead Market Initiative.⁷⁵

The strategic potential of space as a motor for innovations is gaining strength. In September 2008 the Competitiveness Council, while dealing with other aspects of space such as GMES and Galileo, endorsed the possibility of bringing space within the Lead Market Initiative. Most recently, the December 2008 European Council has mentioned space among the economic sectors that deserve special attention for their capacity to contribute to economic growth.

4.2. *The Ongoing Discussion on Harmonization in the Light of the Lisbon Treaty*

As mentioned before, the ESP does not mention any legislative activity or institutional organization, an absence that might be explained by the fact that already at its preparation, so the White Paper seems to suggest, the ESP was designed to be part of an EU shared competence when the Lisbon Treaty (LT) would enter into force. As has been seen in the previous chapter, there is a strong need for cohesion of rules and authorisation procedures relating to space that, due to the trans-boundary nature of space activities, may be better achieved through measures at European level than through national actions.⁷⁶ The inclusion of

⁷⁵ European Commission. A lead market initiative for Europe. COM (2007) 860. 21 dec 2007. Brussels.

³ Aug 2009. http://ec.europa.eu/enterprise/policies/innovation/policy/lead-market-initiative/index_en.htm#h2-a-lead-market-initiative-for-europe

⁷⁶ Marchisio, Sergio. "Potential European Space Policy and its Impact on National Space Legislation". Eds. Stephan Hobe, Bernhard Schmidt-Tedd, Kai-Uwe Schroll. Towards a



Space as a self-standing competence in the Treaty of Lisbon, therefore, was much awaited as it should be able to provide for the legal basis to that end.

4.2.1. European space competence as it currently stands

The current EU/EC Treaties⁷⁷ do not contain any explicit reference to space. However space has been regulated with somewhat far reaching competences in the current framework within the reach of other competences, e.g. GALILEO has been regulated in the context of the Trans-European Networks while GMES has been accommodated by DG Enterprise and Industry and space related projects are managed through the Industrial Research Funding Programme FP7. Equally, other provisions such as environment have provided the basis for the adoption of legislation on data collection, e.g. INSPIRE Directive.⁷⁸ In this context, it has been suggested that the EC is competent to set a legal framework for commercial space exploration and can support the European space industry.

It must also be recalled that, as long as it is not explicitly excluded, the general principles of the EU apply also to space therefore making space subject to the principles of attribution of competences, subsidiarity and proportionality according to which "insofar as the objectives of the proposed action cannot be sufficiently achieved by the MS and can therefore, by reason of the scale of the effects of the proposed action, be better achieved by the Community" the EC may take necessary measures to regulate a policy as long as Community action does not go beyond necessary to achieve the objectives of the Treaty.⁷⁹ Connected to this is the principle of pre-emption whereby the EC can regulate in fields that have not yet been regulated by the MS. When an action in the context of the internal market has not been expressly attributed, the EC may make use of Art. 94 and Art. 95 TEC in order to "approximate" laws. Art 308 TEC provides another means for harmonization whereby in order to achieve the means listed in Art 2

TEC, the EC may create a competence where EC action is proven necessary.

All in all, currently, although the EC lacks an attributed competence, there is a range of possibilities to be able to regulate over space. These range from the current horizontal approach, which is in line with the horizontal nature of space stated in the ESP, through the approximation of rules in specific actions in order to attain the internal market goals, to the adoption of a new competence.

The current landscape and particularly the horizontal approach may have proven a practical means to tackle regulatory needs *ad hoc*, however, seen in the light of the strategic value of space regarding both its contribution to economic growth and its critical relevance for security, the current horizontal approach may not be able to properly support the holistic vision encompassed by the ESP. In addition, while regulatory aspects such as frequency allocation and standardization may be adequately dealt with through their attachment to any other policy, issues regulated by space laws, such as third party liability or the set up of authorisation procedures, may find a difficult fit within other policies as they are intrinsic to space. At an institutional level, the horizontal approach may involve undesirable bureaucracies, duplication of work and time-consuming inter-service negotiations that may hinder due progress on space activities. Finally, in international forums, the EU risks to be represented by different services according to the legislative issue at stake.

In this context, the adoption of a self-standing space competence would seem to be able to provide the institutional basis to reunite all legal and legislative aspects of space while permitting a holistic approach in decision making and a visibly unique image before the international community.

4.2.2. Space in the new Lisbon Treaty

The Lisbon Treaty (LT) introduces several changes that are relevant to the space sector in the context of the EU⁸⁰. The LT regulates also EU relations with International Organisations by establishing that the "Union shall establish all appropriate forms of cooperation with the organs of the United

Harmonised Approach for National Space Legislation in Europe. Köln: 2004. 145, 146

⁷⁷ The Treaty establishing the European Union and the Treaty Establishing the European Community. Nice.

⁷⁸ European Community. Directive Establishing an Infrastructure for Spatial Information in the European Community (INSPIRE). 2007/2/EC. 14 Mar 2007. Brussels: EU

⁷⁹ Art. 5 TEC

⁸⁰ For a general overview see Schmidt –Tedd, Bernhard "Authorisation of space activities after the entry into force of the EU Reform Treaty". ECLS Practitioners Forum 2008. National space legislation in Europe-Issues of authorisation in the light of developments in European space cooperation. ESA Headquarters, Paris, 15 Dec 2008.

Nations and its specialised agencies". The relevance of this attribute is evident as it creates an active role for the EU before International Organisations permitting it more coherent accommodation of EU law to international obligations to which MS are bound.

The traditional measures

While divided in the Treaty of the European Union (TEU) and the Treaty on the Functioning of the European Union (TFEU), the LT brings all general principles, the basic objectives and institutional provisions together with the CFSP and the ESDP into the TEU and encompasses all TEC and 3rd pillar within the TFEU. In this scheme the general principles and main objectives of the EU are preserved as they stand currently, and Art. 94 and Art. 95 on the approximation of laws find their equivalent in Art. 114 and Art. 115 respectively, while Art. 308 finds its equivalent in Art. 352. Therefore, the current mechanism for the approximation of the laws in cases of no specific attribution of competences is maintained.

The space competence

Most importantly, the LT creates a new EU competence for space while shaping it as a *sui generis* competence. The TFEU categorises the competences in exclusive (Art. 3 TFEU), shared (Art. 4 TFEU) and support competences (Art. 6 TFEU). While the first two categories allow for the adoption of legally binding measures (regulations, directives, decisions), the third category attributes to the EU the capacity to adopt actions to support, coordinate and supplement the action of the MS without superseding its competence. Although a list of competences is given per category, space is not included in any of the lists. On the contrary, Art 4(3) TFEU groups space with the areas of research and technological development.

By not including space into the shared competences the TFEU also excludes the applicability of the pre-emption principle to space whereby MS would only exercise their competence to the extent that the EU had decided not to exercise it (Art. 2 (2) TFEU). On the contrary, Art 4. (3) TFEU establishes that MS shall not be prevented from exercising their competence when the EU has decided to do so. This places space in a peculiar situation, while not being listed neither among the exclusive competences nor among support competences, it is still to be

considered a shared competence⁸¹ and, therefore, it has been coined as a "parallel competence"⁸².

The peculiarity of the space competence is reinforced in Art. 189 TFEU which provides for the legal basis of the space competence. In Art. 189 the TFEU recognizes the value of space to boost technology and innovation and provides for the adoption of the ESP. The article reads as follows:

1. To promote scientific and technical progress, industrial competitiveness and the implementation of its policies, the Union shall draw up a European space policy. To this end, it may promote joint initiatives, support research and technological development and coordinate the efforts needed for the exploration and exploitation of space.

2. To contribute to attaining the objectives referred to in paragraph 1, the European Parliament and the Council, acting in accordance with the ordinary legislative procedure, shall establish the necessary measures, which may take the form of a European space programme, excluding any harmonisation of the laws and regulations of the Member States.

3. The Union shall establish any appropriate relations with the European Space Agency.

4. This Article shall be without prejudice to the other provisions of this Title.

By expressly providing for the exclusion of "any" harmonisation of laws and regulations of the Member States, this article seems to exclude even the widest interpretation of the concept of harmonisation which would also categorise as harmonisation the creation of new laws aimed at filling the gaps between national legislations. But the wording of the article still leaves some space for the adoption of legally binding rules, i.e. decisions. Keeping space as a shared competence which allows for the adoption of legally binding instruments may reflect the will for and the relevance of a European Space Policy. However, the elimination of all harmonisation only adds to the peculiar character of this competence approximating it to supportive competences.

⁸¹ According to Art. 4(1) TFEU "The Union shall share competence with the Member States where the Treaties confer on it a competence which does not relate to the areas referred to in Articles 3 and 6.

⁸² Hobe, Stephan; Kunzmann, Katharina; Reuter, Thomas and Julia Neumann. Forschungsbericht ESA-EU: Rechtliche Rahmenbedingungen einer zukünftigen kohärenten Struktur der europäischen Raumfahrt. Berlin: LitVerlag, 2006. 560



The discussions held in the context of projects such as Project 2001 have stressed the relevance of harmonisation in order to overcome the deficiencies of the European space sector. In fact, harmonisation aims at overcoming deficiencies that the principles of the internal market and fair competition are not able to solve.⁸³

In this vein, the peculiarities of space activities, such as their strategic importance, their links to security or their trans-boundary nature, may make the rules of the internal market not the best fitted to overcome the very particular barriers to space activities e.g. high insurance costs and burdensome and unclear authorisation procedures. A full competence or even a listed shared competence subject to the pre-emption principle would have allowed a wider scope of action such as the creation of institutional and legal structures capable of pooling expertise and generating the legal and administrative means to deal with challenges of the space sector at a European level.

In particular, regarding space activities, such competence would probably have allowed the adoption of a common authorisation scheme with common standards and a one-stop-shop licensing system which would have been able to avoid the establishment of foreign operators on the sole basis of convenience within the EU and provide legal certainty and predictability to operators with seats in Europe. The power to harmonise would have had further consequences in the judicial area. EU law would be equally applicable in all national jurisdictions and would, therefore, avoid any forum shopping with regards to the MS. The power of harmonisation would have permitted a more coherent implementation of international obligations and a more coherent participation at international forums.⁸⁴

Another feature of such competence would have comprised the creation of an agency with the expertise to take on assist in the adoption of regulations such as regulations on standards.⁸⁵ It could probably have been capable of acting as a one-stop-shop agency for European and foreign operators applying for authorisation as well as for the conduct of supervisory activities.

The possibility of harmonisation in space would have allowed any intermediary

scenario up to the one that has just been described. However, the lack of any possibility of harmonisation presents the scenario above described as a highly unlikely one. The question however remains on the one hand whether such scenario is desirable given the already existing institutional capacities, and on the other, whether harmonisation is absolutely necessary to overcome the deficiencies created by the current map of space legislation and space activities in Europe.

Enhanced cooperation

The emphasis put in harmonisation may be explained by the little awareness of the institutional implications of harmonisation at European level but mainly because harmonisation is the main pillar of action at EU level after the general principles regulating the internal market. As mentioned before, space presents very specific market characteristics. Space activities are characterised by their global scope and the space market is an eminently international one with only a handful of operators (often not more than one satellite operator per country and rarely a launch services operator) per region. The strategic character of space also implies a strong public control on space activities and therefore, the classical market approach of the EU, i.e. through harmonisation, may not be the best suited to space activities.

As it is well illustrated by the process leading to the adoption of the European Space Policy, common action in the space field in Europe is essential, in particular, a common legal framework for space activities which cannot be achieved solely at national level. Nevertheless, the strategic implications of space with its link to security and international obligations may have triggered the exclusion of harmonisation from the LT. This paradoxical situation where common action is desired but the ordinary methods for common action are limited may require the shaping of space competence in different terms through enhanced cooperation.

Enhanced cooperation was already introduced in the context of Schengen⁸⁶ and the Monetary Union⁸⁷ and most recently incorporated by the Treaty of Nice in the field of CFSP/ESDP but was never applied in this

⁸³ Supra 65

⁸⁴ Specially in view of Art. 34 TEU which provides that Member States shall coordinate their action in international organisations and conferences and shall uphold the Union's positions in such forums.

⁸⁵ Modelled possibly after EASA or Eurocontrol.

⁸⁶ Convention implementing the Schengen Agreement of 14 June 1985 between the Governments of the States of the Benelux Economic Union, the Federal Republic of Germany and the French Republic on the gradual abolition of checks at their common borders. OJ EU L 239 of 22 Sep 2000.

⁸⁷ Title VII TEC.

field (although it has never been applied). Through separate title in the TEU (Art. 20 TEU) and further specification in part six of the TFEU (Arts. 326-334) dedicated to "Institutional and Financial Provisions" the LT detaches enhanced cooperation from any specific policy and makes it available to any other policy field, thus making it also possible in the in the context of Space Policy.

Enhanced cooperation was introduced with the aim to facilitate the furthering of the objectives of the EU and reinforce the integration process allowing a hard core of countries to advance integration in any policy areas covered by the Treaties that are not of exclusive competence (Art. 20 (1) TEU). According to the LT, the MS which establish enhanced cooperation between themselves may make use of the EU institutions and exercise those competences by applying the relevant provisions of the EU Treaties.

Enhanced cooperation is initiated at the initiative of a minimum of nine MS and must be ultimately authorised by the Council (Art 329 (1) TFEU). Y letting the initiative and the ultimate decision in the hands of the MS wanting to further cooperation, this scheme would allow shaping a space competence according to the acceptable parameters for MS. Therefore it could allow the adoption of secondary legislation or even *ad hoc* legal instruments as well as the creation of institutional infrastructures adapted to the current evolution of space policy in Europe i.e. having into account the collaboration between EC and ESA. It would also be able to provide for harmonisation in the desired regulatory fields while leaving aside or designing special mechanisms in those other areas where national public interest is compromised.

Open method of coordination

Yet enhanced cooperation would require a first discussion among the interested member states and a later negotiation in Council as well as approval from the European Commission and the European Parliament which would definitely legitimate the legal basis for further action in space but would questionably be needed if the regulatory needs may still be covered by action at MS level.

In this vein, it is worth noting that the LT incorporates the Open Method of Coordination (OMC). Since the creation of the European Employment Strategy (EES) and

the Luxembourg Process⁸⁸ the EU gained an additional "approximation" mechanism: the Open Method of Coordination (OMC). The EES would later on form a key element of the Lisbon Strategy and with it the OMC would be introduced as an instrument of the Lisbon Strategy.

Although we have seen that for the strategic nature of space and the possibility of adopting legally binding rules (decisions) space cannot be held as a mere supportive competence given the *sui generis* status of the Space Policy in the LT, it has been suggested that the only power left to the EU institutions is the adoption of guidelines in this field. In this regard the OMC would fit the bill bringing the competence of the EU further than mere recommendatory actions.

The OMC provides for a framework of cooperation between MS whereby the MS set common goals for a determined policy and evaluate one another in what has been described as "peer pressure". The MS identify and define the objectives to be achieved, which are then adopted by the Council and followed by guidelines by the European Commission that are then transformed into national policy programmes. MS jointly establish measuring instruments such as statistic indicators and guidelines and benchmarking mechanisms whereby MS compare performance and exchange best practices. The role of the Institutions is rather limited with the European Commission creating guidelines and monitoring the benchmarking progress; but neither the European Parliament (EP) nor the European Court of Justice (ECJ) plays a part in the OMC process.

The OMC is an intergovernmental mode of policy coordination instead of a legislative process and does not impose legally binding measures. As its name indicates, the OMC is an open method for the approximating of policies, not a legal harmonisation tool. The mechanisms of peer review and other indicators can be flexibly chosen according to the policy in question and even "soft law"

⁸⁸ The Amsterdam Treaty introduced a Title VII on employment policy putting in place a comprehensive strategy which would be elaborated later on in the Extraordinary European council Meeting on Employment of Luxembourg, 20/21 November 1997. The Treaty did not provide for a European competence for harmonisation in the field of employment but established a coordinated strategy for employment which would be nourished by the coordinated contribution of the MS an which lead to the Presidency conclusions 20/21 November 1997 and the Commission Guidelines for Member States Employment Guidelines for 1998 et seq. 03 Aug 2009 http://ec.europa.eu/employment_social/eim/summit/en/home.htm



measures can be applied, especially in the context of the Lisbon Strategy⁸⁹.

One of the main strands of action of the Lisbon Strategy is innovation. As we have mentioned, the White Paper sketches the ESP along the lines of the Lisbon Goals that are also collected in the ESP and the 6th Space Council⁹⁰. Thus it seems that the OMC would be well suited not only to the formal constraints created by the LT but also to the aims of the Space Policy in the framework of the Lisbon Strategy.

Given the strong security component of space and the reluctance of MS to give in competence in this area, the OMC would be able to create a coherent regulatory framework throughout the EU by means of guidelines and common practices in terms of authorisation procedures, control supervision mechanisms and technical requirements. Needless to say that the drawback of the OMC lies in its non-binding nature and its incapability to create European-wide institutional infrastructures.

4.3. Conclusions on the Way to a European Legal Framework for the Commercial Space Sector

Whether it happens at a supranational level or at intergovernmental level, there is need for a referential legal framework that brings together space laws in Europe in a way that supports a three-fold aim: it must be able to support the contribution of commercial space activities to the "Growth and Jobs" strategy, it must be able to provide a strong position of European Space Operators in the global context by facilitating competitiveness of the European space sector and it must be able to provide a level playing field with regards to international operators.

The framework to be designed for such purposes must pursue the attainment of a coherent range of licenses and permits which

are adapted to different types of space activities while containing conditions also adapted to the different kinds of operators (launchers or satellite operators). The framework must facilitate a common or coordinated authorisation procedure for all MS incorporating common safety and environmental standards and based on a one-stop-shop authorisation system. On the financial side, the framework should provide for limited insurance according to risk and market based parameters as well as limited liability based on pre-established criteria and not open to a case-by-case approach. Equally, a state warranty mechanism should be also foreseen which, in the case of the EU, could be supported by the contribution of a European Fund for catastrophes⁹¹.

Given that the European Union is able to provide the institutional and legal tools to attain such ends, and given that the possibilities offered by the EU are rather flexible, European MS should strive to agree on a model that will allow them independent implementation of their international obligations through mechanisms that are common to all MS.

The traditional approach has been based on a harmonised model designed in the context of an EU space competence whereby directives would be adopted under the umbrella of the EU institutions and implementation left to national authorities. Such scheme would also allow for the creation of an agency to pull the necessary expertise for the creation of further regulations and the carrying out of supervision of space activities. Given the restrictions posed by LT this scenario seems highly unlikely on the basis of the LT space competence as it seems to exceed the possibilities allowed for by the LT. Nevertheless, it is of some importance to depict this scenario as the uncertainties surrounding the adoption of the LT may lead to reconsideration of the treaty and with it the space competence.

More realistically, MS might still not wish to give in such competence for strategic questions but also because harmonisation in space would mean a capacity to harmonise all other aspects of space such as space programmes which might not be desirable given the already existing cooperation

⁸⁹ In this context a comparison can be established between the EES and the Research Policy. Whereas the first is based on multiyear Commission guidelines that are later implemented by the National Action Plans and reviewed in a yearly basis, the Research OMC is based on guidelines and reports prepared by five working groups at Director General level which are monitored and adapted per cycle of about 2 years. http://ec.europa.eu/invest-in-research/coordination/coordination01_en.htm

⁹⁰ Council of the European Union. Competitiveness Council (6th Space Council). Brussels. 29 May 2009.

⁹¹ An example of a similar regime has already been proposed in the context of European GNSS Third Party Liability. Anna Masutti. "GNSS: the Basic Principles for a European Legal Framework on TPL". Policy Aspects of Third Party Liability in Satellite Navigation. Preparing a Roadmap for Europe. Eds. Alfredo Roma, Kai-Uwe Schrogl and Matxalen Sánchez. Vienna: ESPI, 2009. 30-40

between ESA-EC. Nevertheless, MS are not halted by the Treaties (neither Nice nor Lisbon) to conduct further cooperation outside the reach of the EU towards the approximation of laws. Furthermore through enhanced cooperation MS could be able to further harmonisation in space legislation while shaping the space competence according to a common compromise.

It is also questionable whether harmonisation is absolutely needed for the creation of a European legal framework to support competitive commercial space activities in Europe. Soft law through the establishment of an OMC involving countries with commercial space activities can suffice to bring together national practices and to overcome the deficiencies created by the gaps between the laws. In a technology intensive sector such as space mere guidelines could be insufficient for the creation of a competitive and coherent commercial space sector as the less experienced countries would still lack expertise in drafting and implementing space laws, it would also not warrant common conditions for all European commercial space actors towards international activities.

In fine, although the creation of soft law mechanisms may be able to create a coordinated legal framework for commercial space activities in Europe, this might not suffice to ensure competitiveness. A common or coordinated legal framework must also be supported by executive infrastructure which must be able to pool the expertise and ensure the implementation of the framework while serving as a reference to other national and European authorities. This being said national and European authorities must not be shy in taking advantage of the different possibilities offered by the EU when it comes to designing a coherent legal and regulatory framework for the EU. The approach taken until now has focused on an all-embracing harmonisation. While approximation of legislation can happen through soft in the context of a *sui generis* competence, the creation of the institutional instruments related to such implementation of space law and support to further supervision may need to be based in a stronger competence. This competence may be found in other policies such as the TransEuropean Networks or may be shaped *ad hoc* through enhanced cooperation.



List of Acronyms

B	
BNSC	British National Space Centre
C	
CEPT	European Conference of Postal and Telecommunications Administration
CFSP	Common Foreign and Security Policy
CNES	Centre National des Études Spatiales
COPUOS	Committee on the Peaceful Uses of Outer Space
CSLA	Commercial Space Launch Act
E	
EC	European Community
ECJ	European Court of Justice
EES	European Employment Strategy
EP	European Parliament
ESA	European Space Agency
ESDP	European Security and Defence Policy
ESP	European Space Policy
ESPI	European Space Policy Institute
EU	European Union
F	
FAA	Federal Aviation Administration
G	
GMES	Global Monitoring Environment and Security
L	
LIAB	Liability Convention (Convention on International Liability for Damage Caused by Space Objects)
LT	Lisbon Treaty
M	
MS	Member State
N	
NSAU	National Space Authority of Ukraine
O	
OMC	Open Method of Coordination
OST	Outer Space Treaty (Treaty on Principles Governing the Activities of States in the Exploration and Use of Outer Space, including the Moon and Other Celestial Bodies)
R	
REG	Registration Convention (Convention on Registration of Objects Launched into Outer Space)
S	
SOA	Space Operations Act
T	
TEC	Treaty of the European Community
TFEU	Treaty on the Functioning of the European Union
U	
UK	United Kingdom
UN	United Nations
US	United States
W	
WTO	World Trade Organisation

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Brainstorming meeting of 27 March 2009 at ESPI. Clockwise from left: Kai-Uwe Schrogl, Armel Kerrest, Bernhard Schmidt-Tedd, Ulrike Bohlmann, Kenneth Hodgkins, Irmgard Marboe, Sergio Marchisio, Rafael Moro Aguilar, Niklas Hedman, Matxalen Sanchez Aranzamendi.

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