The EU Export Control Regime on Outer Space Technologies

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Content

1 Introduction

Since the launch of the first man-made satellite Sputnik 1 in 1957, outer space has become a crucial tool for economic, social and cultural development. Our daily lives, commercial activities and scientific research have been increasingly related to outer space. Thus, outer space is part and parcel of the modern society.

Furthermore, outer space technologies have become a key in high technology development, both in the military and civilian fields. This made the borderline between military and civilian technologies increasingly blurry. In fact, most of the civilian applications of space technology have their origin in strategic and military domain.

Technologies related to space launch vehicles may also be deployed in ballistic missiles and thus can have a major impact on the proliferation of weapons of mass destruction (WMD).

Satellites play a vital role in the crisis management during natural catastrophes, or allow real time communication world-wide. At the same time, satellites may provide all kinds of support to military forces, ranging from gathering intelligence information to issuing early warning of hostile missile launches.

Consequently, controlling and limiting trade and transfers of space technologies is essential for national and international security.

This thesis shall explain how the export of outer space technologies is governed on the European level. Therefor it is based on three basic questions:

- What are outer space technologies?
- What is their relevance for Europe?
- How is the EU export control framework established?

First, this thesis will give an introduction to the basic terminology and technical background. Further, it will provide an overview of the European Union's (EU) activities in outer space and the European space industry. Finally, it will explain the principles, structure and functioning of the EU export control framework.

2 Outer Space Technologies

2.1 Definitions

Although commonly used, international and European law do not provide for a legal definition of the term ‘outer space technology’.[1]

Outer space refers to the region beyond Earth’s atmospheric envelope.[2] The Hungarian aeronautical engineer and physicist Theodore von Kármán defined the boundary between airspace and outer space as the altitude at which a vehicle has to travel faster than escape velocity in order to obtain sufficient aerodynamic lift. This so-called ‘Von Kármán line’ varies due to multiple parameters (e.g. air pressure, temperature or technological development) but is supposed to be at an altitude of 100 km above sea level.[3]

The question of the legal delimitation of outer space has frequently been raised by the relevant institutions such as the United Nations Committee on the Peaceful Uses of Outer Space (UNCOPUOS) or the Fédération Aéronautique Internationale (FAI). However, no international consent on a clear boundary has been found yet. At present, the Von Kármán line can be considered the most legally relevant approach.[4]

Originating from the Greek word ‘tekhnologia’ (meaning 'systematic treatment'; from tekhnē ‘art, craft’ + -logia), the dictionary defines ‘technology’ as *the application of scientific knowledge for practical purposes*, *the machinery and devices developed from scientific knowledge* and *the branch of knowledge dealing with engineering or applied sciences*.[5]

Consequently, ‘technology’ refers to industrial and scientific know-how, including written and tacit knowledge, human resources and technical management expertise, needed to research, develop, make and use new equipment or expertise for practical purposes.

Colloquially the term ‘technology’ is also used synonymously for both physical goods and their underlying technical knowledge. From a legal perspective, however, and especially within the context of export control law, there is a clear distinction between a physical good or item and the associated technologies.

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[1] Mineiro, Michael C., The Dilemma of National Security and International Cooperation in Outer Space: Space Technology Trade and Proliferation Controls and their Impact on Global Civil Space Cooperation (2011) 10.
[2] Angelo, Joseph A. JR., Encyclopedia of Space and Astronomy (2006) 442.
[3] Macdonald, Malcolm, A System-Level View of Space Projects, in: Badescu, Viorel, Macdonald, Malcolm (eds.), The International Handbook of Space Technology (2014) 25, 25.
[4] Neger, Thomas, Walter, Edith, Space law – an independent branch of the legal system, in: Brünner, Christian, Soucek, Alexander (eds.), Outer Space in Society, Politics and Law (2011) 234, 239.
[5] Homepage of Oxford Dictionaries - www.oxforddictionaries.com/de/definition/englisch_usa/technology (01.06.15).

‘Outer space technologies’ are technologies designed or intended for use in outer space or on a celestial body or, more general, in a space application.

They can be categorized by various characteristics, such as their function, use, size or location. In export control regimes, they are typically divided into three broad categories related to the application of the technology: (i) Launch vehicles, (ii) spacecraft and (iii) ground support equipment.[6]

(i) Launch vehicles are transportation systems which carry spacecraft and their payloads into outer space. Space launch vehicles need sufficient thrust to achieve escape velocity in order to ‘break free’ from Earth’s gravitational attraction and reach a stable orbit. Suborbital launch vehicles, including intercontinental ballistic missiles (ICBMs) and sounding rockets, travel above altitudes of 100 km without achieving escape velocity. Therefore they do not complete one orbital revolution but have a ballistic trajectory (‘suborbital spaceflight’).[7]

Today, all launch vehicles are rocket-powered using one or more solid or liquid propellants. Essential components of a launch vehicle are its propellant tanks, engines, structures, navigation and guidance equipment, separation systems, attitude control and flight data monitoring systems. Launch vehicles can be expendable or fully or partly reusable. Most modern space launch vehicles have more than one stage, each with its own engines and propellant tanks.[8]

(ii) A spacecraft is a vehicle or vessel designed to operate in outer space. Spacecraft are composed of a platform (also called ‘bus’) and the payload. The platform comprises all the subsystems required to provide and maintain the mandatory electrical and environmental operations, such as the power supply, communications systems, attitude control, propulsion, thermal control and life support systems (in case of manned spacecraft only). The payload is usually attached to the platform and contains the people and instruments that perform the primary mission, for example cargo, passengers, flight crew, scientific experiments or other equipment.[9]

(iii) Ground support equipment provides for tracking, telemetry and command of the platform (‘TT&C’) and the operation and exploitation of the payload.

Tracking generally refers to measuring the position of a spacecraft. Telemetry allows to monitor the physical conditions of a spacecraft, such as its height, battery voltage or temperature.

[6] Mineiro, Michael C., *supra* Fn 1, 12f.
[7] Masson-Zwaan, Tanja, Crowther, Legal and Regulatory Issues, in: Badescu, Viorel, Macdonald, Malcolm (eds.), The International Handbook of Space Technology (2014) 657, 671f.
[8] Angelo, Joseph A. JR., *supra* Fn 3, 349f.
[9] Angelo, Joseph A. JR., *supra* Fn 3, 556.

Command provides for the operation of a spacecraft and its payload from the ground, based on the mission needs.[10]

2.2 Dual-use Characteristics

The term 'dual-use' refers to a usage which has both civil and military employment. Respectively, dual use technologies are used for civilian purposes but may also have military applications, whether proven or potential.[11] Due to their technical characteristics and unique possible applications, the majority of space technologies is dual use by nature.[12]

The technologies required to manufacture sophisticated weapons, including nuclear weapons and ballistic missiles, are very similar if not identical to those used in developing a launch vehicle. Both use the same propulsion and propellant, they need similar navigation and guidance equipment and consist of one or more stages.

Historically, the first launch vehicles were derived from intercontinental or medium-range ballistic missiles, designed to carry nuclear warheads. Sputnik 1 was launched on board a Russian 8K71PS rocket, a modified version of the R-7, the world's first ICBM.[13] Explorer 1, the first American satellite in outer space, was carried on a modified version of a PGM-19 Jupiter, the first medium-range ballistic missile of the US Air Force.[14]

Still, several modern launch vehicles are derived from ballistic missiles (e.g. Chinas Long March 4[15]). However, the differing needs of space rockets and strategic missiles have caused the development of space launch vehicles and missiles to diverge.

Spacecraft aren't generally considered dual-use for their capacity to carry weapons, but for their potential end-user application and because single components may be deemed militarily sensitive.[16]

Due to the various fields of application, satellite technologies play an important role in the development and life of modern civil society. Satellite services provide for a global, real-time exchange of information, they monitor Earth's land, oceans, ice packs, clouds and atmosphere or allow us to determine our exact location on the ground.

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[10] Angelo, Joseph A. JR., *supra* Fn 3, 282.
[11] Wetter, Anna, Enforcing European Union Law on Exports of Dual-use Goods (2009) xv.
[12] Mineiro, Michael C., *supra* Fn 1, 14.
[13] Konyukhov, Stanislav Nikolaevich, Conversion of Missiles into Space Launch Vehicles, in: Mark, Hans (ed.), Encyclopedia of Space Science & Technology Vol. 1 (2003) 441, 441ff.
[14] Angelo, Joseph A. JR., *supra* Fn 3, 99.
[15] Maini, Anil K., Agrawal, Varsha, Satellite Technology: Principles and Applications (2011) 27f.
[16] Mineiro, Michael C., *supra* Fn 1, 15.

By contrast, satellite services may also be of great strategic advantage to military and intelligence operations. Communication satellites provide for wireless communication in battlefield situations, navigation satellites guide missiles to their targets and surveillance satellites deliver high resolution photos of enemy territory.

Single components of a spacecraft with characteristics exceeding certain performance parameters may also be considered dual use. Typically, radiation hardened devices, ultra-high resolution image sensors or certain propulsion systems are considered as militarily sensitive.[17] Ground support equipment can be used for military purposes as well. TT&C technology can be utilized to provide early-warning of ballistic missiles or to track satellites in Earth orbit. Furthermore, ground support equipment is used to obtain telemetric data of ballistic missile tests and for military communications purposes.[18]

3 The EU in Outer Space

3.1 The EU Space Competence

The Lisbon Treaty, signed in 2007 and entered into force in 2009, introduced a new explicit space competence for the EU, contained in Article 4 (3) and Article 189 of the Treaty on the Functioning of the European Union (TFEU). [19] Article 4 (3) TFEU states the following:

> In the areas of research, technological development and space, the Union shall have competence to carry out activities, in particular to define and implement programmes; however, the exercise of that competence shall not result in Member States being prevented from exercising theirs.

Accordingly, the EU and the member states have shared competence in the field of outer space. However, and contrary to the basic rule governing shared competence, the exercise of the EU's competence does not limit the competence of member states. Member states therefore are still allowed to carry out national space programs and contribute to intergovernmental organization, such as the European Space Agency (ESA).

Article 189 TFEU states:

[17] Mineiro, Michael C., *supra* Fn 1, 20.

[18] Gasparini Alves, Péricles, The Transfer of Dual-Use Outer-Space Technologies: Confrontation or Cooperation? (2000) 38.

[19] Mantl, Leopold, The European Union, in: Brünner, Christian, Soucek, Alexander (eds.), Outer Space in Society, Politics and Law (2011) 406, 415.

> 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.

According to paragraph 1 of Article 189 TFEU, the EU has an explicit mandate to elaborate a European space policy (ESP). To this end, paragraph 2 empowers the European Parliament and the Council, by following the ordinary legislative procedure, to establish necessary measures which may take the form of a European space program. Additionally, paragraph 2 excludes any harmonization of the laws and regulations of the member states. Paragraph 3 provides for the establishment of *any appropriate relations with the European Space Agency*.

3.2 The European Space Policy

Although the EU did not focus on space activities in the first decades of its existence, its policies had a major impact on the European space sector. First, the establishment of the common market, which ensures the free movement of goods, services, people and capital between member states, allowed efficient management of cross-border space activities. Second, standardization activities of the European standardization organizations (such as the European Telecommunications Standards Institute) ensured interoperability of the different components of a space system. Also, the harmonization of export control rules realized a common control system for the export of dual-use goods from the EU to third countries.[20]

[20] Mantl, Leopold, *supra* Fn 19, 410f.

The direct involvement of the EU in outer space began in 1994. Together with ESA and Eurocontrol, the EU developed the European Geostationary Navigation Overlay System (EGNOS), a satellite based augmentation system and the precursor of Galileo.[21]

In 1998, the EU established the Global Monitoring for Environment and Security (GMES, now Copernicus), an Earth observation initiative, together with ESA and EUTMETSAT.[22]

Only one year later, the EU launched the definition phase of Galileo, a global navigation satellite system (GNSS), consisting of a constellation of 30 satellites in medium Earth orbit.[23]

The EU-ESA framework agreement[24], which provides the legal framework for the increasing cooperation between the two institutions and sets up the instruments for this cooperation, was adopted in 2003.[25] The agreement sets out two main aims, namely the coherent and progressive development of an overall ESP and the establishment of a common basis and suitable arrangements for efficient and mutually beneficial cooperation between ESA and the EU.[26] To this end, the agreement established the Space Council, the EC-ESA Joint Secretariat and the High Level Space Policy Group. [27]

The fields of cooperation enumerated in the EU-ESA Framework Agreement include all relevant sectors of space activities, such as science, technology, earth observation, navigation or human spaceflight. As possible means of cooperation the agreement suggests, inter alia, the management of EU space-related activities by ESA, the participation by the EU in an optional program of ESA or the carrying out of activities which are coordinated, implemented and funded by both parties.[28]

Since its establishment, the Space Council has met more or less annually to discuss and agree upon the orientations to be given to the ESP and the priorities for the European space program.[29]

As a result of this process, the Space Council adopted the 'Resolution on the European Space Policy' at its 4th meeting in 2007, laying down the general principles for a common political framework for space activities in Europe.[30]

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[21] Mantl, Leopold, *supra* Fn 19, 419f.
[22] Mantl, Leopold, *supra* Fn 19, 426f.
[23] Mantl, Leopold, *supra* Fn 19, 420ff.
[24] Framework Agreement between the European Community and the European Space Agency 2003.
[25] Schmidt-Tedd, Bernhard, The Relationship between the EU and ESA within the Framework of European Space Policy and its Consequences for Space Industry Contracts, in: Smith, Lesley Jane, Baumann, Ingo (eds.), Contracting for Space (2011) 25, 26f.
[26] Art. 1 Framework Agreement between the European Community and the European Space Agency 2003.
[27] Art. 8 Framework Agreement between the European Community and the European Space Agency 2003.
[28] Art. 5 Framework Agreement between the European Community and the European Space Agency 2003.
[29] Slijper, Frank, The EDA's inroads into space, in: Karampekios, Nikolaos, Oikonomou, Iraklis (eds.), The European Defence Agency: Arming Europe (2015) 241, 246.
[30] Mantl, Leopold, *supra* Fn 19, 414.

This resolution is the most comprehensive document on the ESP so far. It highlights the strategic nature of the space sector contributing to the independence, security and prosperity of Europe and recognizes the actual and potential contributions from space activities to support EU policies such as the Lisbon strategy for growth and employment, to science and research and to Europe's Sustainable Development Strategy.[31]

In addition, the resolution identifies a clear distribution of roles and responsibilities between the EU, ESA and the member states. Accordingly, the EU shall draw on the management and technical expertise of ESA and use ESA as its procurement agent for EU space activities.

Subsequent Resolutions of the Space Council developed and refined the ESP.[32]

3.3 The European Space Industry

Space industry refers to economic activities related to the manufacture and delivery of components that go into Earth's orbit or beyond. Its core activities comprise the sectors of satellite manufacturing, ground system manufacturing and the launch industry.

The space industry is a highly specialized, high-tech industry generating worldwide revenues of about USD 85 billion in 2014.[33]

With some 36 000 employees, the European space industry has seen continual revenue growth since 2009, reaching around USD 8.8 billion in 2013.[34] Main industrial sites are located in France, Germany, Italy, and, to a lesser extent, United Kingdom, Spain and Belgium.[35]

At present, the two main markets of the European space industry are an institutional domestic market and a market for commercial and export customers.

The European institutional market represented more than half of the final sales in 2012. Institutional customers include ESA, other civil agencies such as CNES, DLR, ASI and military agencies such as the French DGA.

The main commercial and export customers include commercial satellites operators (i.e. Eutelsat or SES in Europe; Arabsat or Globalstar outside Europe), launch service providers (i.e. Arianespace), and institutions and governmental bodies outside Europe. [36]

The share of export sales accounts for 20% of the total turnover of the European space industry, which is way above the level of exports realized by any non-European competitor.[37]

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[31] I. Resolution on the European Space Policy 2007.
[32] II.F.12. Resolution on the European Space Policy 2007.
[33] OECD, The Space Economy at a Glance 2014 (2014) 50.
[34] OECD, *supra* Fn 33, 17.
[35] Eurospace, The European Space Industry in 2012 (2012) 1.
[36] Eurospace, *supra* Fn 35, 5.
[37] Eurospace, *supra* Fn 35, 1.

Satellite manufacturing is the main source of income for the European space industry and is also the main domain of exports. Telecommunications systems are the source of about 50% of the whole satellite manufacturing revenue, followed by Earth observation and navigation systems.[38]

European satellite manufacturers were involved in the production of 22 spacecraft launched in 2012, for both European and non-European customers. Airbus Defence and Space and Thales Alenia Space are the leading European satellite manufacturer and are directly responsible for about 57% of the total European space industry employment.

Launch services account for about 25% of all revenue. European launch services are primarily marketed and operated by Arianespace. The European launcher family is composed of three complementary space launch vehicles, namely the Ariane-5 for heavy payloads, the Soyuz for intermediate payloads and the Vega for smaller missions. All the Europe launch vehicles are launched from the European Space Port in Kourou, French Guyana.

Ariane and Vega launch systems are both produced and integrated by companies located within the EU. Airbus Defence and Space is responsible for the development and production of the Ariane 5. The Vega rocket is produced in Italy at Avio's industrial facilities in Colleferro. Although launcher parts (e.g. fairings, nozzles) are also exported and integrated to non-European launchers (e.g. Atlas, H2), this market only makes about 2% of the total launcher sales.

Today, the Ariane 5 is the preferred choice of launch vehicle for commercial customers worldwide. It has been used mainly by commercial customers to launch spacecraft to geostationary orbit. Between 1996 and 2012, a total of 67 Ariane 5 rockets were launched and brought more than 100 satellites into Earth's orbit. [39]

The ground system segment represented less than 15 % of total European space industry sales in 2012. It is primarily a European market with a majority of public customers.[40]

[38] Eurospace, *supra* Fn 35, 11.
[39] Eurospace, *supra* Fn 35, 12.
[40] Eurospace, *supra* Fn 35, 13.

4 The EU Export Control Regime on Outer Space Technologies

4.1 Overview

Technology export refers to the cross-border transfer of technologies from one entity to another. Such transfer may be tangible, in the form of any type of media, verbally in direct or telephone conversations or visually just by seeing how things are done.[41]

It is the sovereign right of each state to control and regulate cross-border movements of goods, people and services.[42] States usually control and restrict exports of military sensitive technology to critical states, as a means to promote their national security and foreign policy interests and to prevent the proliferation of sophisticated weapons, such as ballistic missiles or WMD:[43]

In order to be effective, export control regimes need to be coordinated as extensively as possible at international level.[44] Numerous international treaties and export control arrangements exist today aiming at the harmonization of national export control regulations and licensing policies. They restrict the spread of sophisticated weapons and establish common rules for the export of dual-use technologies. Furthermore, the United Nations Security Council (UNSC), acting under Chapter VII of the United Nations Charter, imposes arms embargoes or certain obligations upon states with regards to export controls.[45]

There are no international treaties, arrangements or UNSC Resolutions whose specific subject matter is outer space technology export controls.[46] However, outer space technologies usually fall within the scope of national and international export control regulations due to their inherent dual-use nature.

The Treaty on the Non-Proliferation of Nuclear Weapons (NPT)[47] is a legally binding treaty and lays down restrictions on the spread and development of nuclear weapons and associated technologies.[48] The Arms Trade Treaty[49] is an international treaty that sets out global rules to stop the flow of conventional arms, munitions and related items.

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[41] Hertzfeld, Henry R., Jones, Raymond L., International aspects of technology controls, in: Brünner, Christian, Soucek, Alexander (eds.), Outer Space in Society, Politics and Law (2011) 638, 638f.
[42] Pezzullo, Michael, Sovereignty in an Age of Global Interdependency: the Role of Borders (2014) 4.
[43] Hertzfeld, Henry R., Jones, Raymond L., *supra* Fn 41, 638f.
[44] Wetter, Anna, *supra* Fn 11, 72.
[45] Mineiro, Michael C., *supra* Fn 1, 33.
[46] Mineiro, Michael C., *supra* Fn 1, 35.
[47] Treaty on the Non-Proliferation of Nuclear Weapons, signed in 1968 and entered into force in 1970, available at: www.iaea.org/sites/default/files/publications/documents/infcircs/1970/infcirc140.pdf (10.07.15).
[48] Bermbach, Simone, Die gemeinschaftliche Ausfuhrkontrolle für Dual-use-Güter (1997) 12.
[49] The Arms Trade Treaty, signed in 2013 and entered into force in 2014, available at: unoda-web.s3.amazonaws.com/wp-content/uploads/2013/06/English7.pdf (10.07.15).

Three non-binding multilateral regimes coordinate national policies on export controls of certain outer space technologies, namely the Missile Technology Control Regime (MTCR)[50], the Hague Code of Conduct (HCoC)[51] and the Wassenaar Arrangement on Export Controls for Conventional Arms and Dual-use Goods and Technologies (WA).[52]

UNSC Resolution 1540[53], adopted in 2004, imposes affirmative duties on all UN member states to implement appropriate legal measures and rules to prevent the proliferation of WMD.[54]

For EU member states, Council Regulation (EC) No 428/2009 (Dual-use Regulation)[55] provides the main legal framework for controlling the export of dual-use technologies from the EU to third countries.[56] The Dual-use Regulation is legally binding and directly applicable in all EU member states.[57] It incorporates the international obligations of the various control regimes and of the United Nations (UN). The Dual-use Regulation contains common EU export control rules, a common list of controlled items and establishes four common export authorizations. In case of an infringement of the provisions of the Regulation, member states are obligated to impose effective, proportionate and dissuasive civil or criminal penalties.[58]

In accordance with the national security exception contained in Article 4 TEU, controls on arms exports remain within the sole competence of member states.[59] However, within the framework of the Common Foreign and Security Policy (CFSP), the Council, in its Common Position 2008/944/CFSP[60], has establishes rules for the export of arms and military equipment and technologies. Council Joint Action 2000/401/CFSP[61] makes certain types of intangible transfers of military and dual use technologies subject to export controls.

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[50] Missile Technology Control Regime, established in 1987, available at: www.mtcr.info/english/guidetext.html (10.07.15).

[51] Hague Code of Conduct, established in 2002, available at: www.hcoc.at/?tab=what_is_hcoc&page=text_of_the_hcoc (10.07.15).

[52] Wassenaar Arrangement on Export Controls for Conventional Arms and Dual-use Goods and Technologies, established in 1996, available at: www.wassenaar.org/guidelines/ (10.07.15).

[53] Resolution 1540 (2004) Adopted by the United Nations Security Council at its 4956th meeting, on 28 April 2004 (UNSC Resolution 1540).

[54] Wetter, Anna, *supra* Fn 11, 15.

[55] Council Regulation (EC) No 428/2009 of 5 May 2009 setting up a Community regime for the control of exports, transfer, brokering and transit of dual-use items, last amended by Regulation (EU) No 1382/2014 of 22 October 2014 (Dual-use Regulation 2009).

[56] Creydt, Matthias, Hörl, Kay-Uwe, Export Control Issues in Space Contracts, in: Smith, Lesley Jane, Baumann, Ingo (eds.), Contracting for Space (2011) 291, 294f.

[57] Art. 288 Treaty on the Functioning of the European Union 2009.

[58] Creydt, Matthias, Hörl, Kay-Uwe, *supra* Fn 56, 294f.

[59] Waibel, Michael, Competence Review: Trade and Investment (2013), 8.

[60] Council Common Position 2008/944/CFSP of 8 December 2008 defining common rules governing control of exports of military technology and equipment (Council Common Position 2008/944/CFSP).

[61] Council Joint Action 2000/401/CFSP of 22 June 2000 concerning the control of technical assistance related to certain military end-uses (Council Joint Action 2000/401/CFSP).

Also within the CFSP framework, the Council may adopt restrictive measures, namely export embargoes on arms and dual use items.[62]

4.2 The International Context

4.2.1 Treaty on the Non-Proliferation of Nuclear Weapons & Arms Trade Treaty

The NPT was concluded in 1968 and entered into force in 1970.[63] Today, 191 states are parties to the NPT, including all EU member states.[64] The NPT aims to prevent the spread of nuclear weapons and nuclear weapon technologies, to promote the peaceful uses of nuclear energy, and to further the goal of achieving nuclear disarmament.

The NPT distinguishes 'nuclear-weapon States' from 'non-nuclear-weapon States' by defining the former as those states that have manufactured and exploded a nuclear weapon or other nuclear explosive device prior to January 1, 1967. [65] Only 5 states fall in this category, namely China, France, Russia, UK and the US.[66] All other states are considered non-nuclear-weapon states.

The nuclear-weapon states agree *not to transfer to any recipient whatsoever nuclear weapons or other nuclear explosive devices* and *not in any way to assist, encourage, or induce any non-nuclear-weapon state to manufacture or otherwise acquire nuclear weapons or other nuclear explosive devices*.[67]

On the other hand, non-nuclear-weapon states agree not to receive or manufacture nuclear weapons and *not to seek or receive any assistance in the manufacture of nuclear weapons or other nuclear explosive devices*.[68]

Developing, testing, and delivering nuclear weapons is closely related to R&D on space technologies. Delivery systems of nuclear warheads can be re-purposed as launch vehicles. Furthermore, certain technologies applied in spacecraft, including structural materials, communications equipment, avionics equipment and certain computers, also find use in nuclear weapons.[69]

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[62] Ehrlich, Wolfgang, *supra* Fn 56, 11.
[63] Bermbach, Simone, *supra* Fn 48, 11.
[64] Homepage of UNODA - disarmament.un.org/treaties/t/npt (01.06.15).
[65] Art. IX Treaty on the Non-Proliferation of Nuclear Weapons 1970.
[66] Wetter, Anna, *supra* Fn 11, 12.
[67] Art. I Treaty on the Non-Proliferation of Nuclear Weapons 1970.
[68] Art. II Treaty on the Non-Proliferation of Nuclear Weapons 1970.
[69] Yarymovych, Michael I., Evolution of U.S. Expendable Launch Vehicles, in: Mark, Hans (ed.), Encyclopedia of Space Science & Technology Vol. 1 (2003) 619, 625ff.

The NPT explicitly prohibits the transfer of technologies only for the purpose of manufacturing nuclear weapons. Consequently, nuclear-weapon states and non-nuclear-weapon states are free to transfer and receive aforementioned technologies for peaceful purposes, and especially for civil applications.

The Arms Trade Treaty entered into force on 24 December 2014. All EU member states have signed the treaty, although some have not ratified it yet.[70] State parties are obligated to establish a control system regulating the export of munitions and ammunition for arms listed under Article 2.1, covering inter alia missiles.[71] Exports of arms which would violate UNSC Resolutions, break international treaties or arms embargoes, or may contribute to crimes against humanity, war crimes, genocide, grave breaks of the Geneva Conventions, or attacks against civilians must not be authorized.[72]

4.2.2 The Missile Technology Control Regime & The Hague Code of Conduct

The MTCR is an informal and voluntary association of states aiming to limit the proliferation of ballistic missiles and other unmanned delivery systems capable of delivering WMD.[73]

By 2014, 34 countries had joined the MCTR including almost all EU member states, except Cyprus, Estonia, Latvia, Lithuania, Malta, Romania, Slovakia and Slovenia.[74]

The MTCR is based on a set of common export policy guidelines, called the 'MTCR Guidelines for Sensitive Missile-relevant Transfers'. Members of the MTCR apply voluntarily the guidelines in their national export control regimes. The MTCR Guidelines are supplemented by the 'Equipment, Software and Technology Annex', which contains a common list of controlled items.[75] The annex is divided into 'Category I' and 'Category II' items.

Category I items are of greatest sensitivity.[76] They cover, inter alia, complete rocket systems, including both suborbital and space launch vehicles, capable of carrying a 500-kilogram payload at least 300 kilometers.[77] Also covered are production facilities[78] and major sub-

[70] Homepage of The Nuclear Threat Initiative - www.nti.org/treaties-and-regimes/arms-trade-treaty-att/ (01.06.15).
[71] Art. 3 Arms Trade Treaty 2013.
[72] Art. 6 Arms Trade Treaty 2013.
[73] Bermbach, Simone, *supra* Fn 48, 14.
[74] Homepage of the MTCR - www.mtcr.info/english/partners.html (01.06.15).
[75] Wetter, Anna, *supra* Fn 11, 19.
[76] 1. (a) MTCR Equipment, Software and Technology Annex 2014.
[77] Category I 1.A.1 MTCR Equipment, Software and Technology Annex 2014.
[78] Category I 1.B.1 MTCR Equipment, Software and Technology Annex 2014.

systems including individual rocket stages, re-entry vehicles, rocket engines, guidance systems and warhead mechanisms.[79]

Category II items include complete rocket systems not covered in Category I, capable of a maximum range equal to or greater than 300 km[80] and numerous dual-use satellite technologies such as navigation[81], radar[82] or flight control systems[83].

According to the guidelines, members shall exercise restraint in the consideration of all transfers of items contained in the annex and shall consider such transfers on a case by case basis.[84] Members shall exercise particular restraint in the consideration of Category I transfer applications, regardless of their purpose.[85] Furthermore, the guidelines emphasize that they *are not designed to impede national space programs or international cooperation in such programs as long as such programs could not contribute to delivery systems for weapons of mass destruction*.[86]

The HCoC is intended to supplement the MTCR. It is a politically binding document aimed at bolstering international efforts to prevent ballistic missile proliferation worldwide.[87] Since its establishment in 2002, the number of subscribing states has increased from 96 to 137, including all EU member states.[88]

The HCoC mainly focuses on multilateral confidence-building and transparency instruments such as annual reports of subscribing states on their national ballistic missile and space launch vehicle programs and to exchange pre-launch notifications on their ballistic missile and space launch vehicle launches and test flights.

4.2.3 The Wassenaar Arrangement

The WA is a voluntary international export control regime.[89] Currently, 41 states are members of the agreement including all EU member states, with the exception of Cyprus.[90]

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[79] Category I 2.A.1 a to f MTCR Equipment, Software and Technology Annex 2014.
[80] Category II 19.A.1 MTCR Equipment, Software and Technology Annex 2014.
[81] Category II 9.A.7 MTCR Equipment, Software and Technology Annex 2014.
[82] Category II 11.A.1 MTCR Equipment, Software and Technology Annex 2014.
[83] Category II 10.A.1 to 10.A.3 MTCR Equipment, Software and Technology Annex 2014.
[84] 1. MTCR Guidelines for Sensitive Missile-relevant Transfers 2003.
[85] 2. MTCR Guidelines for Sensitive Missile-relevant Transfers 2003.
[86] 1. MTCR Guidelines for Sensitive Missile-relevant Transfers 2003.
[87] Mineiro, Michael C., *supra* Fn 1, 38f.
[88] Homepage of the HCoC - www.hcoc.at/?tab=subscribing_states&page=subscribing_states (01.06.15).
[89] Weith, Nils, Die exportkontrollrechtliche Ausfuhrgenehmigung unter Berücksichtigung von Gemeinschaftsverwaltungsrecht und Aspekten der Gefahrenprävention (2009) 16.
[90] Homepage of the Wassenaar Arrangement - www.wassenaar.org/participants/index.html (01.06.15).

The arrangement is set out in a document entitled 'Guidelines & Procedures', comprising the 'Initial Elements' which are supplemented by the 'Lists of Dual Use Goods and Technologies' and the 'Munitions List'. The lists are reviewed regularly to reflect technological developments.[91]

The Munition List contains approximately 300 items specially designed for military use.

The Lists of Dual Use Goods and Technologies is composed of nine categories covering approximately 1000 items. Category 9 entitled 'Aerospace and Propulsion' lists, inter alia, space launch vehicles, complete spacecraft, spacecraft platforms and spacecraft payloads as controlled items.[92]

Members of the WA agree to control exports of all items set forth in the lists[93] in order to prevent unauthorized transfers and to exchange information and notifications on their export activities related to those items.[94]

4.2.4 United Nations Security Council Resolution 1540

UNSC Resolution 1540, adopted in 2004, establishes legally binding obligations under Chapter VII of the UN Charter for all UN member states to adopt and enforce effective national export regimes prohibiting the proliferation of WMD and their means of delivery,[95] and in particular to prevent the spread of WMD to non-state actors.[96] It also obligates all UN member states to have either criminal or civil penalties in place for violations of export control laws.[97]

4.3 Council Regulation (EC) No 428/2009

4.3.1 Legal Basis

The competences of the EU are defined in the EU Treaties. According to Article 3 (1. e) TFEU, the European Union has exclusive competence with respect to the common commercial policy (CCP). The CCP is based on uniform principles, particularly in regard to the achievement of uniformity in measures of trade liberalization, export policy and other trade matters.[98]

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[91] Gasparini Alves, Péricles, *supra* Fn 18, 300f.
[92] 9.A.4 a to d Wassenaar Lists of Dual Use Goods and Technologies 2015.
[93] III.1. Wassenaar Lists of Dual Use Goods and Technologies 2015.
[94] IV, V and VI Wassenaar Initial Elements 2014.
[95] Para. 3 UNSC Resolution 1540 (2004).
[96] Para. 3 UNSC Resolution 1540 (2004).
[97] Para. 3 (d) Resolution 1540 (2004).
[98] Art. 207 Treaty on the Functioning of the European Union 2009.

However, national security remains the sole responsibility of each member state.[99] Controlling the export of dual-use items is at the forefront of international non-proliferation efforts and therefore is guided by major national security interests.

The first attempt to establish a common export control regime on dual-use goods consisted of a Council Regulation[100], based on the CCP, and a Council Decision[101], adopted on the basis of the CFSP. While the former outlined the control procedures and mechanisms, the latter comprised the lists of controlled items and destinations. Both texts were closely linked by numerous cross-references and formed an 'integrated system'.[102]

The European Court of Justice (ECJ) has interpreted the scope of the competence of the CCP broadly, covering the exclusive and comprehensive regulation of all EU's external trade relations.[103] In its judgements *Criminal proceedings against Leifer and others*[104] and *Werner vs Germany*[105] the ECJ ruled that regulations restricting exports of dual-use goods fall within the scope of the CCP and consequently lie within the exclusive competence of the EU. The integrated system was therefore violating Community law and was later replaced by a single Regulation based on the CCP.[106]

4.3.2 Scope of Application

As defined by Article 2 (1) of the Dual-use Regulation, 'dual-use items' are items, including goods, software and technology, *which can be used for both civil and military purposes, and shall include all goods which can be used for both non-explosive uses and assisting in any way in the manufacture of nuclear weapons or other nuclear explosive devices*.

'Technology' in the sense of the Regulation means specific information necessary for the development, production or use of goods. This information may take the form of technical data, such as operation manuals, blueprints, plans, diagrams and models, or technical assistance, which may take forms such as instructions, skills or training.[107]

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[99] Art. 4 (1) Treaty on the European Union 2009.
[100] Council Regulation (EC) No 3381/94 of 19 December 1994 setting up a Community regime for the control of exports of dual-use goods.
[101] Council Decision 94/942/CFSP of 19 December 1994 on the joint action adopted by the Council on the basis of Article J.3 of the Treaty on European Union concerning the control of exports of dual-use goods.
[102] Bermbach, Simone, *supra* Fn 48, 31f.
[103] Moestl, Michaela, EU: Kompetenzabgrenzung zwischen Gemeinschafts- und Unionspolitiken (2004) 48ff.
[104] Judgment of the Court of 17 October 1995 - Criminal proceedings against Leifer and others - Case C-83/94.
[105] Judgment of the Court of 17 October 1995 - Fritz Werner Industrie-Ausrüstungen GmbH v Federal Republic of Germany - Case C-70/94.
[106] Wetter, Anna, *supra* Fn 11, 48f.
[107] Definitions Annex I to the Dual-use Regulation 2009.

Export authorizations cover the minimum technology necessary for the installation, operation, maintenance and repair of the items supplied.[108]

Technologies which have been made available without restrictions or are derived from basic scientific research are exempt from an authorization requirement.[109]

The Dual-use Regulation applies to the (i) export, (ii) transfer, (iii) brokering and (iv) transit of dual-use items.[110]

(i) Export refers to the transfer of tangible Union dual-use items and the re-export of tangible non-Union dual-use items from a member state to a destination situated outside the EU customs territory. The export of software or technology by intangible means of transfer (such as any electronic means or by oral transmission over the telephone) is also covered by the Regulation.[111] Not covered is the transfer of technology through cross-border movement of natural persons.[112]

(ii) The term 'transfer' relates to the movement of tangible dual-use items within the EU.[113]

(iii) 'Brokering' refers to any activity facilitating the purchase, sale or transfer of tangible dual-use items between third countries. Ancillary services, such as transportation, financial services, insurance or re-insurance are excluded from this definition.[114]

(iv) 'Transit' means the transport of tangible non-Union dual-use items entering and passing through the customs territory of the EU with a destination outside the customs territory.[115]

4.3.3 Requirement for Authorization

4.3.3.1 Export of Dual-use Items

All exports of dual-use items listed in Annex I to the Dual-use Regulation are subject to a license requirement, regardless of their intended destination and end-use.[116]

Exports of dual-use items not listed in Annex I are covered by a 'catch-all clause' contained in Article 4 of the Regulation. Accordingly, an export authorization is required if the exporter has been informed by the competent authorities of the member state in which he is established that

[108] Quentin, Michel, The European Union Dual-Use Items Control Regime - Comment of the Legislation article-by-article (2014) 13.
[109] The General Technology Note Annex I to the Dual-use Regulation 2009.
[110] Art. 1 Dual-use Regulation 2009.
[111] Art. 2 (2) Dual-use Regulation 2009.
[112] Quentin, Michel, *supra* Fn 108, 23.
[113] Art. 22 Dual-use Regulation 2009.
[114] Art. 2 (5) Dual-use Regulation 2009.
[115] Art. 2 (7) Dual-use Regulation 2009.
[116] Art. 3 Dual-use Regulation 2009.

the items in question are or may be intended for the development of WMD or missiles capable of delivering such weapons, that the items are or may be intended for a military end-use, if the country of destination is subject to an EU, OSCE or UN arms embargo or that the items are or may be intended as parts or components of military items that have already been exported illegally. Furthermore, member states may prohibit or impose a licensing requirement on the export of non-listed dual-use items for reasons of public security or human rights considerations.[117]

4.3.3.2 Transfer of Dual-use Items

The free movement of goods is one of the fundamental principles of the EU's single market.[118] However, the transfer of certain particularly sensitive dual-use items is subject to a license requirement. [119] A list of these items is included in Annex IV to the Regulation.

Member states may also impose an authorization requirement on the transfer of dual-use items not listed in Annex IV if the final destination of the items concerned is outside the EU customs territory, the export of those items is subject to an authorization requirement and no processing or working is to be performed on the items in the member state to which they are to be transferred.[120]

Although no authorizations is required for transfers of dual-use items not covered by Annex IV, exporters are required to keep documents and records of transfers of items listed in Annex I for at least three years.[121]

4.3.3.3 Brokering of Dual-use Items

In principle, it is allowed to provide brokering services related to dual-use items from the EU customs territory. However, if a broker is aware that the items for which he proposes brokering services are listed in Annex I and are or may be intended for the development of WMD or missiles capable of delivering such weapons, he must notify the competent authorities of the member state in which he is established. The competent authorities will then decide whether or not it is expedient to make such brokering services subject to authorization. An authorization is

[117] Art. 8 Dual-use Regulation 2009.
[118] Borchardt, Hans-Dieter, Die rechtlichen Grundlagen der Europäischen Union (2012) 385.
[119] Art. 22 (1) Dual-use Regulation 2009.
[120] Art. 22 (2) Dual-use Regulation 2009.
[121] Art. 22 (8) Dual-use Regulation 2009.

always required if the broker has been informed by the competent authorities that the items in question are or may be intended for such end-uses.[122]

4.3.3.4 Transit of Dual-use Items

Dual-use items which transit though the EU are not subject to a license requirement. The transit of items listed in Annex I may be prohibited by the competent authorities of the member state where the transit occurs if the items are or may be intended for the development of WMD or missiles capable of delivering such weapons.[123]

Before deciding whether or not to prohibit a transit of listed items, the competent authorities may impose in individual cases an authorization requirement for the specific transit.[124]

Member states may also prohibit the transit of non-listed dual-use items which are intended for use in connection with WMD or missiles capable of delivering such weapons or which are intended for military end-use, if the country of destination is subject to an EU, OSCE or UN arms embargo.[125]

4.3.4 Lists of Dual-use Items

4.3.4.1 Annex I

Annex I to the Dual-use Regulation establishes a common list of dual-use items that require a license when exported outside of the EU. The list is based on multilateral export control regimes including the WA and the MTCR.[126] In order to ensure full compliance with international obligations, the list is updated periodically by delegated acts of the Commission.[127]

Dual-use items are subdivided into ten categories (namely: [0] Nuclear materials, facilities and equipment; [1] Special materials and related equipment; [2] Materials processing; [3] Electronics; [4] Computers; [5] Telecommunications and ″information security″; [6] Sensors and lasers ; [7] Navigation and avionics; [8] Marine; and [9] Aerospace and propulsion).

Each item is identified by a designator comprising a combination of letters and numbers.

[122] Art. 5 (1) Dual-use Regulation 2009.
[123] Art. 6 (1) Dual-use Regulation 2009.
[124] Art. 6 (2) Dual-use Regulation 2009.
[125] Art. 6 (3) Dual-use Regulation 2009.
[126] First sentence of Annex I to the Dual-use Regulation 2009.
[127] Art. 15 (3) Dual-use Regulation 2009.

The first digit (0 to 9) defines the category of the item. The second digit (A to E) further divides the items into 5 sub-categories ([A] Systems, Equipment and Components; [B] Test, Inspection and Production Equipment, [C] Materials, [D] Software; and [E] Technology). The third digit (0 to 4) refers to the international export regime that controls the item ([0] WA; [1] MTCR; [2] Nuclear Suppliers Group; [3] Australia Group; and [4] Chemical Weapons Convention). The following digits define the item itself.[128]

The list comprises over 500 dual-use items. Covered are both new and used items and items being components of non-listed goods when the listed-component is the principal element of the good and can feasibly be removed or used for other purposes.[129]

Sounding rockets capable of a range of at least 300 km[130], space launch vehicles, spacecraft buses[131] and components, systems and structures therefor[132] are listed explicitly as controlled items in Category 9.

Components especially designed for launch vehicles are covered by Categories 1, 4, 6, 7 and 9. Categories 1 and 4 list certain materials and computer systems which are designed and used for space launch vehicles and sounding rockets.[133] Categories 6, 7 and 9 cover radar and tracking systems[134], receiving equipment for GNSS[135], altimeters[136], flight control systems[137], rocket propulsion systems[138] and launch support equipment.[139]

Certain items deployed in launch vehicles are listed because of their potential use in missiles, such as staging and separation mechanisms[140] or high accuracy guidance sets.[141]

The platform of a spacecraft only falls within the scope of the Regulation if its components are covered by other categories or items contained in Annex I.[142]

Certain sensitive items especially designed for operation at altitudes greater than 100 km above the surface of the Earth, and therefore identified as ‘space-qualified’[143], are listed in Categories 3, 6 and 7.

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[128] Quentin, Michel, *supra* Fn 108, 137.
[129] General Note 2 to Annex 1 to the Dual-use Regulation 2009.
[130] 9A104 Annex I to the Dual-use Regulation 2009.
[131] 9A004 Annex I to the Dual-use Regulation 2009.
[132] 9A010 Annex I to the Dual-use Regulation 2009.
[133] e.g. 1A102 or 4A101 Annex I to the Dual-use Regulation 2009.
[134] 6A108.a. Annex I to the Dual-use Regulation 2009.
[135] 7A105.a. Annex I to the Dual-use Regulation 2009.
[136] 7A106 Annex I to the Dual-use Regulation 2009.
[137] 7A116 Annex I to the Dual-use Regulation 2009.
[138] 9A005 and 9A007 Annex I to the Dual-use Regulation 2009.
[139] 9A115.a. and .b. Annex I to the Dual-use Regulation 2009.
[140] 9A117 Annex I to the Dual-use Regulation 2009.
[141] 7A117 Annex I to the Dual-use Regulation 2009.
[142] Note to 9A004 Annex I to the Dual-use Regulation 2009.
[143] Definitions Annex I to the Dual-use Regulation 2009.

Category 3 covers space-qualified electronic components and equipment, such as travelling wave tubes[144] used as amplifiers in communication satellites, solar panels[145] and Atomic frequency standards[146]. Space-qualified optical sensors or equipment and components therefor, including solid-state detectors and imaging sensors designed for remote sensing applications,[147] cryocoolers[148], laser radars and light detection and ranging equipment[149] are listed in Category 6. Category 7 covers space-qualified inertial measurement equipment.[150]
GNSS receiving equipment for military use is also listed in Category 7.[151]

4.3.4.2 Annex IV

Items mentioned in Annex IV to the Dual-use Regulation require a license for intra-community transfers. These items are considered the most sensitive in terms of potential contribution to the proliferation of WMD.[152] Items listed in Annex IV are identified by the same designator used in Annex I.
Annex IV is subdivided in two parts. Part I contains items related to stealth technology, the Union strategic control and MTCR technology.
Listed MTCR technologies cover, inter alia, space launch vehicles and sounding rockets capable of delivering at least a 500 kg payload to a range of at least 300 km[153], rocket propulsion systems and components therefor[154] and other components of launch vehicle with potential application in missiles.
Part II comprises items of the Chemical Weapons Convention and the Nuclear Suppliers Group.
Covered MTCR technologies that are transferred on the basis of a contractual relationship placed by ESA or that are transferred by ESA to accomplish its official tasks are exempt from the authorization requirement. The same exception applies to the member state's national space agencies.[155]

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[144] 3A001b1.a.4.c. Annex I to the Dual-use Regulation 2009.
[145] 3A002.e.4. Annex I to the Dual-use Regulation 2009.
[146] 3A002.g.1. Annex I to the Dual-use Regulation 2009.
[147] 6A002.a.1. and 6A002.b.2.b. Annex I to the Dual-use Regulation 2009.
[148] 6A002.d.1. Annex I to the Dual-use Regulation 2009.
[149] 6A008.j.1. Annex I to the Dual-use Regulation 2009.
[150] 7A003.d.2. 6A002.d.1. Annex I to the Dual-use Regulation 2009.
[151] 7A005 Annex I to the Dual-use Regulation 2009.
[152] Aubin, Yann, Idiart, Arnaud, Export Control Law and Regulations Handbook: A Practical Guide to Military and Dual-Use Goods (2011) 116.
[153] 9A004 and 9A104 Annex IV to the Dual-use Regulation 2009.
[154] 9A005 and 9A005.a. Annex IV to the Dual-use Regulation 2009.
[155] Exemptions Annex IV to the Dual-use Regulation 2009.

4.3.5 Types of Authorization

4.3.5.1 General Authorizations

The EU General Export Authorization (EU GEA) and the National General Export Authorization are the two types of general licenses foreseen by the Dual-use Regulation. Both offer a highly simplified procedure for the export of dual-use items to non-EU countries.[156]

EU GEAs are issued directly by the EU. The six existing EU GEAs are set out in Annexes IIa to IIf.[157] Each EU GEA contains a precise list of covered destinations, a specific list of items that may be exported to those destinations and a set of conditions of use, which must be adhered to when exporting under the particular authorization.

Exporters using EU GEAs must notify their use to the competent member state authorities. Member states may also require exporters to register for the use of EU GEAs or to provide national authorities with information on exports made under EU GEAs. [158]

The competent member state authorities may prohibit the use of EU GEAs where they have a 'reasonable suspicion' about an exporter's ability to fully comply with the terms of the EU GEA or with export control legislation in general.[159]

Exports cannot benefit from EU GEAs if the exported items are or may be used in connection with WMD, will or may have a military end-use in countries subject to arms embargoes, or will or may be incorporated into military items exported from the EU without a valid export license.[160]

Certain goods and technologies deployed in outer space are covered by EU GEAs 001, 003 and 004.

EU GEA 001, contained in Annex IIa, covers the export of most items contained in Annex I to Australia, Canada, Japan, New Zealand, Norway, Switzerland, Liechtenstein and the US. Excluded are all items listed in Annex IV, such as rocket propulsion systems and staging and separation mechanisms, which can also be used in missiles.

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[156] Ministry of Foreign Affairs, The Netherlands, Export Control: User Guide on Strategic Goods and Services for the Netherlands (2013) 30.
[157] Art. 9 (1) Dual-use Regulation 2009.
[158] Part 2 (1) Annex IIa to the Dual-use Regulation 2009; Part 3 (3) Annex IIb to the Dual-use Regulation 2009; Part 3 (4) Annex IIc to the Dual-use Regulation 2009; Part 3 (5) Annex IId to the Dual-use Regulation 2009; Part 3 (3) Annex IIe to the Dual-use Regulation 2009; Part 3 (3) Annex IIf to the Dual-use Regulation 2009.
[159] Art. 9 (1) Dual-use Regulation 2009.
[160] Part 2 (2) Annex IIa to the Dual-use Regulation 2009; Part 3 (1) Annex IIb to the Dual-use Regulation 2009; Part 3 (2) Annex IIc to the Dual-use Regulation 2009; Part 3 (3) Annex IId to the Dual-use Regulation 2009; Part 3 (1) Annex IIe to the Dual-use Regulation 2009; Part 3 (1) Annex IIf to the Dual-use Regulation 2009.

EU GEA 003, contained in Annex IIc, concerns exports of most items listed in Annex I to 27 destinations, where the relevant item was initially exported from the EU under a valid license and later re-imported into the EU for the purpose of maintenance, repair or replacement. Excluded are all goods listed in Annex IV, certain optical sensors and any software and technology.

EU GEA 004 is contained in Annex IId and covers the same items and destinations as EU GEA 003 for the temporary export for exhibitions and fares.

National General Export Authorizations are granted by the member states for exports of specific non-sensitive dual-use items to certain destinations. They are available to all exporters, established in the member state issuing the authorizations, if they meet the requirements set out in the Regulation and in the complementary national legislation.[161]

A National General Export Authorization may not be used if the exporter has been informed by the competent authorities of the member state that the items in question are or may be used in WMD, that the items are or may be intended for a military end-use and the country of destination is subject to an arms embargo or that the items are or may be intended as parts or components of military items that have already been exported illegally.[162]

Items listed in Annex IIg cannot be subject to a National General Export Authorization.[163] Items listed in part II of Annex IV are excluded from National General Authorizations for intra-Community trade.[164]

4.3.5.2 Individual & Global Authorizations

The basic type of export license is the individual export authorization. It is granted to one specific exporter covering exports of one or several dual-use items to a single end-user.[165]

Global authorizations are granted to one specific exporter for a type or category of dual-use items valid for exports to one or more specified end-users in one or more third countries.[166]

Exporters shall supply the competent authorities with all relevant information required for their applications, in particular on the end-user, the country of destination and the end-use of the item exported. The authorization may be subject, if appropriate, to an end-use statement.[167]

[161] Art. 9 (4.b.) Dual-use Regulation 2009.
[162] Art. 9 (4.c.) Dual-use Regulation 2009.
[163] Art. 9 (4.a.) Dual-use Regulation 2009.
[164] Part II first sentence Annex IV to the Dual-use Regulation 2009.
[165] Art. 2 (8) Dual-use Regulation 2009.
[166] Art. 2 (10) Dual-use Regulation 2009.
[167] Art. 9 (2) Dual-use Regulation 2009.

Authorizations for brokering services cover a set quantity of specific items moving between two or more third countries. The location of the items in the originating third country, the end-user and its exact location must be clearly identified.[168]

Individual and global export authorizations and authorizations for brokering services are issued by the competent authority of the member state where the exporter or broker is established. All authorizations are valid throughout the Union.[169]

In deciding whether or not to grant an export authorization or an authorization for brokering services, the competent authorities shall take into account all relevant considerations, including obligations under the relevant international non-proliferation regimes, export control arrangements and existing sanctions and arms embargoes, considerations of national foreign and security policy and considerations about intended end-use and the risk of diversion.[170]

4.4 Council Joint Action 2000/401/CFSP

4.4.1 Legal Basis

The Council Joint Action 2000/401/CFSP was established within the framework of the CFSP. The rules and principles governing the CFSP are laid down in Article 21 to Article 46 TEU. Although the adoption of legislative acts is not permitted within the CSFP, Article 28 TEU allows the Council to adopt necessary decisions where the international situation requires operational action by the Union. Accordingly, such decisions commit the member states in the positions they adopt and in the conduct of their activity.

4.4.2 Principles

The intangible transfer of technologies through cross-border movement of natural persons is not covered by the Dual-use Regulation. This issue, however, is partly covered by the Joint Action.[171]

The Joint Action is applicable to technical assistance provided in third countries by a natural or legal person established in the EU.[172]

[168] Art. 10 (1) Dual-use Regulation 2009.
[169] Art. 9 (2) and Art. 10 (1) Dual-use Regulation 2009.
[170] Art. 12 Dual-use Regulation 2009.
[171] Quentin, Michel, *supra* Fn 108, 23.
[172] Art. 2 Council Joint Action 2000/401/CFSP.

Technical assistance refers to any technical support related to repairs, development, manufacture, assembly, testing, maintenance, or any other technical service. This may take forms such as instruction, training, transmission of working knowledge or skills or consulting services, including also oral forms of assistance.[173]

Technical assistance shall be subject to controls if it is intended, or the provider is aware that it is intended, for use in connection with the development, production or operation of WMD or of missiles capable of delivering such weapons.[174]

Technical assistance is not subject to a license requirement if it is provided in countries covered by EU GEA 001, if it takes the form of transferring information that is in the public domain or basic scientific research or if it is in oral form and not related to the development, production or operation of WMD.[175]

Member state have to implement the Joint Action by laying down respective control provisions and by determining the sanctions to be taken at national level.[176]

Not covered by the Joint Action is the transfer of technologies through the movement of foreign citizens into the EU.[177]

4.5 Council Common Position 2008/944/CFSP

4.5.1 Legal Basis

The Council Common Position 2008/944/CFSP was also established within the framework of the CFSP. According to Article 29 TEU, the Council may adopt decisions defining the approach of the Union to a particular matter. The member states have to ensure that their national policies conform to the Union's positions.

4.5.2 Principles

The Common Position prescribes Union-wide minimum standards and criteria for the management of exports of military technology and equipment.[178]

[173] Art. 1 (a) Council Joint Action 2000/401/CFSP.
[174] Art. 2 Council Joint Action 2000/401/CFSP.
[175] Art. 4 Council Joint Action 2000/401/CFSP.
[176] Art. 5 Council Joint Action 2000/401/CFSP.
[177] Quentin, Michel, *supra* Fn 108, 23.
[178] Preamble (3) Council Common Position 2008/944/CFSP.

Covered are exports, brokering services and transits of items listed in the Common Military List of the European Union[179]. Corresponding license applications shall be assessed on a case-by-case basis against the criteria set out in Article 2.[180]

Member states shall apply the same criteria in respect of dual-use items contained in Annex I to the Dual-use Regulation where there are serious grounds for believing that the end-user will be the armed forces or internal security forces or similar entities in the recipient country.[181]

According to Article 2 of the Common Position, member states shall take into consideration their international obligations and commitments, the recipient country's attitude towards relevant principles established by international human rights instruments, the internal situation in the country of final destination, the preservation of regional peace, security and stability, the national security of the member states, the behavior of the buyer country with regard to the international community, the existence of a risk of re-exportation under undesirable conditions and the compatibility of the export with the technical and economic capacity of the recipient country.

Member states shall grant licenses only on the basis of reliable knowledge of end-use in the country of final destination. This will generally require an end-user certificate or some form of official authorization issued by the country of final destination.[182]

The Common Position does not affect the right of member states to have more restrictive national export policies.[183]

4.5.3 The EU Common Military List

The Common Military List of the European Union is adopted and regularly revised by the Council and published in the C series of the Official Journal of the European Union. It is based on the WA's Munitions List[184] and acts as a reference point for member states' national military technology and equipment lists, but does not replace them.[185]

The list covers military good as well as software and technology specially designed or modified for the development, production or use of the listed goods.

[179] Common Military List of the European Union adopted by the Council on 27 February 2012.
[180] Art. 1 Council Common Position 2008/944/CFSP.
[181] Art. 6 Council Common Position 2008/944/CFSP.
[182] Art. 5 Council Common Position 2008/944/CFSP.
[183] Art. 3 Council Common Position 2008/944/CFSP.
[184] Homepage of the OSCE - www.osce.org/fsc/139606?download=true (01.06.15).
[185] Art. 12 Council Common Position 2008/944/CFSP.

Included are rockets, missiles and components therefor, specially designed for military use,[186] and certain space-qualified equipment and material.

4.6 EU Restrictive Measures

4.6.1 Legal Basis

The imposition of restrictive measures falls within the CFSP framework. Restrictive measures are an essential foreign policy tool of the EU and may take the form of trade and financial sanctions, travel bans or arms embargoes. They can be used to implement binding Resolutions of the UNSC under Chapter VII of the UN Charter or to impose autonomous EU sanctions in pursuit of the CFSP objectives described in Article 21, Paragraph 2 TEU.[187]

Decisions concerning EU restrictive measures are adopted by the Council on the basis of unanimity. Such acts are legally binding and directly applicable in all EU member states.[188]

Decision interrupting or reducing, in part or completely, economic and financial relations with third countries, including restrictions on exports of dual-use items, additionally require the implementation of a Council regulation.[189]

4.6.2 Arms Embargoes

The overall aim of arms embargoes is to stop the flow of arms and military equipment to conflict areas or to regimes that are likely to use them for internal repression or aggression against foreign countries. Arms embargoes generally comprise a prohibition on the direct and indirect supply, sale and transfer of arms and related materiel and services. At a minimum, arms embargoes apply to the items found in the EU Common Military List. A prohibition on providing technical assistance relating to such items and bans on financing of or providing financial assistance for arms exports normally is also provided.[190]

Embargoes on dual-use items are usually applied with qualifications and scope for appropriate exemptions.

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[186] ML 4 Common Military List of the European Union adopted by the Council on 27 February 2012.
[187] General Secretariat of the Council, Guidelines on implementation and evaluation of restrictive measures (sanctions) in the framework of the EU Common Foreign and Security Policy (2012) 5.
[188] Homepage of the Council - www.consilium.europa.eu/en/press/press-releases/2014/04/pdf/factsheet-eu-restrictive-measures/ (01.06.15).
[189] Art. 215 (1) Treaty on the Functioning of the European Union 2009.
[190] Homepage of the European External Action Service - eeas.europa.eu/cfsp/sanctions/docs/index_en.pdf (01.06.15).

Numerous EU arms embargoes exist today, covering countries such as Afghanistan, Belarus, Iran, Iraq, North Korea or the Russian Federation. The embargoes against Iran and the Russian Federation also cover almost all dual-use items listed in Annex I of the Dual-use Regulation.[191]

5 Conclusion

Outer space technologies are technologies designed or intended for use in outer space or on a celestial body. Due to their possible civil and military applications, most outer space technologies are dual-use by nature.

With the establishment of EGNOS, Galileo and Copernicus the EU has become a space player herself. Since the entry into force of the Treaty of Lisbon, the EU has an explicit space competence containing a mandate to define and implement a ESP and a European space program. The ESP highlights the actual and potential contributions from space activities to support important EU policies and provides for a comprehensive framework for a close cooperation with ESA.

Private European companies are amongst the global leaders in the space industry. European satellite manufacturers and launch service providers especially benefit from the increasing domestic and export market.

States regard the export of technologies related to arms and other military applications to certain states as a threat to their national security and foreign policy interests and international non-proliferation efforts. Since it is the sovereign right of each State to control and regulate cross-border movements of goods, people and services, states usually control and restrict transfers of military sensitive technology from their territory.

In order to prevent evasions of their export policies, states have concluded numerous international treaties and arrangements harmonizing national export control rules.

The Dual-use Regulation establishes a common control regime on the export of dual-use items from EU member states to third countries. The Regulation is based on the CCP, which lies within the exclusive competence of the EU. At the heart of the Dual-use Regulation is the common list of controlled dual-use items, contained in Annex I, which incorporates the member states' obligations under the various international treaties and export control regimes. The export, transfer, transit and brokering of all listed goods, materials and technologies are subject

[191] Homepage of the European External Action Service - eeas.europa.eu/cfsp/sanctions/docs/measures_en.pdf (01.06.15).

to an authorization requirement. The 'catch-all clause' covers exports of any non-listed dual-use item in case of a potential military end-use.

The Regulation foresees four different types of export authorizations which are valid throughout the Union. National individual, global and general authorizations are granted by the member states' competent authorities according to the rules established in the Regulation. Exports covered by EU GEAs do not need further authorization at the national level.

Within the framework of the CSFP, the Council has agreed on certain restrictions on the exports of arms and other military technologies. Council Joint Action 2000/401/CFSP lays down rules for the export of certain intangible transfers of military and dual-use technologies. Council Common Position 2008/944/CFSP contains Union-wide minimum standards for the export of arms and other military equipment and technologies.

Further restrictions on the export of arms and dual-use items are contained in restrictive measures adopted by the Council, implementing UNSC Resolutions or imposing autonomous EU sanctions in pursuit of the CFSP objectives.

In the writer's opinion, the Dual-use Regulation establishes a fairly liberal export control regime which provides for a swift procedure and takes due regard to the needs of the exporter. It is also flexible, allowing the EU to quickly adapt to international developments and leaves sufficient leeway in its application to the member states. This permits the maintenance of an internationally competitive space industry in Europe with a high share of export sales.

However, emerging space powers, such as Brazil, Argentina, India, South Korea or Japan, strive to build their domestic space industries and will reduce their need for high technology imports in the future. Existing space powers with restrictive export control regimes, including the US, may also change their export policies and allow their industries access to important European export markets.

Anyway, the EU will have to rethink and reinforce its presence in outer space in order to keep an internationally competitive domestic space industry. The EU's space competence and the ESP could provide effective means therefor. Particular attention must be payed to the strategic development of the ESP, the establishment of a comprehensive European space program and of a fair European procurement policy which ensure a reasonable distribution of risks and benefits between all stakeholders.

The impact of export restriction policies on other economies, and especially developing economies, has to be discussed in this context as well. Export control rules going beyond what is necessary and reasonable may prohibit the access of states to technologies which are essential

for their infrastructural development and the welfare of their citizens. Yet international technology transfer is not only a matter of export control but also of international development cooperation, intellectual property protection and other fields of policy and law.

The effectiveness of sanctions and trade embargoes also needs to be further scrutinized. The past has shown that the unintended side effects of trade sanctions can cause vast humanitarian disasters. As a result, new forms of sanctions have emerged which try to reduce the impact on the civil population and target only the responsible decision-makers.

The enforcement of the Dual-use Regulation by the member states has to be discussed in more detail too. A deeper analysis of these questions, however, is beyond the scope of this paper.

Export control policies are an essential means to facilitate international disarmament and the non-proliferation of sophisticated weapons but cannot serve as the ultimate solution to meet these very fundamental objectives. They need to be accompanied by various other national and international policies such as the establishment of international supervisory bodies and other international bodies promoting the peaceful exploitation of dual-use technologies, development aid, trade liberalization or confidence and security building measures.

The high costs and risks involved in the effective exploration and exploitation of outer space imply and require international collaboration and exchange of assets, technical know-how and management expertise. Especially, states have to reaffirm their obligation and commitment under international law to regard outer space as the province of all mankind, and therefore share the fundamental socio-economic benefits resulting from outer space activities within the international community.

6 Bibliography

Books

Angelo, Joseph A. JR., Encyclopedia of Space and Astronomy (New York 2006)

Aubin, Yann, Idiart, Arnaud, Export Control Law and Regulations Handbook: A Practical Guide to Military and Dual-Use Goods (New York 2011)

Badescu, Viorel, Macdonald, Malcolm (eds.), The International Handbook of Space Technology (Berlin 2014)

Bermbach, Simone, Die gemeinschaftliche Ausfuhrkontrolle für Dual-use-Güter (Hamburg 1997)

Borchardt, Hans-Dieter, Die rechtlichen Grundlagen der Europäischen Union (Vienna 2012)

Brünner, Christian, Soucek, Alexander (eds.), Outer Space in Society, Politics and Law (Wien 2011)

Ehrlich, Wolfgang, Das Genehmigungsverfahren für Dual-use-Waren im deutschen Exportkontrollrecht (Münster 2003)

Eurospace, The European Space Industry in 2012 (Paris 2013)

Gasparini Alves, Péricles, The Transfer of Dual-Use Outer-Space Technologies: Confrontation or Cooperation? (Geneva 2000)

Karampekios, Nikolaos, Oikonomou, Iraklis (eds.), The European Defence Agency: Arming Europe (New York 2015)

Maini, Anil K., Agrawal, Varsha, Satellite Technology: Principles and Applications (Noida 2011)

Mark, Hans (ed.), Encyclopedia of Space Science & Technology Vol. 1 (Hoboken 2003)

Mineiro, Michael C., The Dilemma of National Security and International Cooperation in Outer Space: Space Technology Trade and Proliferation Controls and their Impact on Global Civil Space Cooperation (Montreal 2011)

Ministry of Foreign Affairs, The Netherlands, Export Control: User Guide on Strategic Goods and Services for the Netherlands (Den Haag 2013)

Moestl, Michaela, EU: Kompetenzabgrenzung zwischen Gemeinschafts- und Unionspolitiken (Vienna 2004)

OECD, The Space Economy at a Glance 2014 (Paris 2014)

Quentin, Michel, The European Union Dual-Use Items Control Regime - Comment of the Legislation article-by-article (Liege 2014)

Smith, Lesley Jane, Baumann, Ingo (eds.), Contracting for Space (Dorchester 2011)

Weith, Nils, Die exportkontrollrechtliche Ausfuhrgenehmigung unter Berücksichtigung von Gemeinschaftsverwaltungsrecht und Aspekten der Gefahrenprävention (Münster 2009)

Wetter, Anna, Enforcing European Union Law on Exports of Dual-use Goods (Oxford 2009)

International Treaties and Other International Legal Documents

Arms Trade Treaty 2013

MTCR Equipment, Software and Technology Annex 2014

MTCR Guidelines for Sensitive Missile-relevant Transfers 2003

Resolution 1540 (2004) Adopted by the United Nations Security Council at its 4956th meeting, on 28 April 2004

Treaty on the European Union 2009

Treaty on the Functioning of the European Union 2009

Treaty on the Non-Proliferation of Nuclear Weapons 1970

Wassenaar Initial Elements 2014

Wassenaar Lists of Dual Use Goods and Technologies 2015

EU Legal Documents

Common Military List of the European Union adopted by the Council on 27 February 2012

Council Common Position 2008/944/CFSP of 8 December 2008 defining common rules governing control of exports of military technology and equipment

Council Decision 94/942/CFSP of 19 December 1994 on the joint action adopted by the Council on the basis of Article J.3 of the Treaty on European Union concerning the control of exports of dual-use goods

Council Joint Action 2000/401/CFSP of 22 June 2000 concerning the control of technical assistance related to certain military end-uses

Council Regulation (EC) No 3381/94 of 19 December 1994 setting up a Community regime for the control of exports of dual-use goods

Council Regulation (EC) No 428/2009 of 5 May 2009 setting up a Community regime for the control of exports, transfer, brokering and transit of dual-use items, last amended by Regulation (EU) No 1382/2014 of 22 October 2014

Framework Agreement between the European Community and the European Space Agency 2003

General Secretariat of the Council, Guidelines on implementation and evaluation of restrictive measures (sanctions) in the framework of the EU Common Foreign and Security Policy 2012

Resolution on the European Space Policy 2007

ECJ Jurisprudence

Judgment of the Court of 17 October 1995 - Criminal proceedings against Leifer and others - Case C-83/94

Judgment of the Court of 17 October 1995 - Fritz Werner Industrie-Ausrüstungen GmbH v Federal Republic of Germany - Case C-70/94

Articles

Pezzullo, Michael, Sovereignty in an Age of Global Interdependency: the Role of Borders (2014) – available at: www.immi.gov.au/about/speeches-pres/_pdf/sovereignty-age-interdependency-04122014.pdf (01.06.15)

Waibel, Michael, Competence Review: Trade and Investment (2013) – available at: www.gov.uk/government/uploads/system/uploads/attachment_data/file/270992/bis-14-511-trade-and-investment-competence-review-independent-review-legal-research-by-michael-waibel.pdf (01.06.15)

Internet

Homepage of Oxford Dictionaries - www.oxforddictionaries.com/de/definition/englisch_usa/technology (01.06.15)

Homepage of the Council - www.consilium.europa.eu/en/press/press-releases/2014/04/pdf/factsheet-eu-restrictive-measures/ (01.06.15)

Homepage of the European External Action Service - eeas.europa.eu/cfsp/sanctions/docs/index_en.pdf (01.06.15)

Homepage of the European External Action Service - eeas.europa.eu/cfsp/sanctions/docs/measures_en.pdf (01.06.15)

Homepage of the HCoC - www.hcoc.at/?tab=subscribing_states&page=subscribing_states (01.06.15)

Homepage of the MTCR - www.mtcr.info/english/partners.html (01.06.15)

Homepage of The Nuclear Threat Initiative - www.nti.org/treaties-and-regimes/arms-trade-treaty-att/ (01.06.15)

Homepage of the OSCE - www.osce.org/fsc/139606?download=true (01.06.15)

Homepage of the Wassenaar Arrangement - www.wassenaar.org/participants/index.html (01.06.15)

Homepage of UNODA - disarmament.un.org/treaties/t/npt (01.06.15)