CHATHAM HOUSE

Chatham House, 10 St James's Square, London SW1Y 4LE
T: +44 (0)20 7957 5700 E: contact@chathamhouse.org.uk
F: +44 (0)20 7957 5710 www.chathamhouse.org.uk
Charity Registration Number: 208223

European Security and Defence Forum Workshop

A New European Security Architecture?

The EU as a force for stability in space – The EU Code of Conduct for Outer Space Activities

Valerio Briani

Researcher, Istituto Affari Internazionali, Rome

11 November 2010

This paper was presented at the European Security and Defence Forum (ESDF) organized by Chatham House. Chatham House is not responsible for the content of this paper.

INTRODUCTION

On September 2010, the EU adopted a second draft of the EU Code of Conduct for Outer Space Activities (EU CoC). The Code, a politically and not legally binding document, aims to establish some rules of good conduct for outer space activities. Now the European Union will have to try to muster enough adoption of the Code, at the international level, to make it an effective soft law tool for space governance.

The fate of the CoC should be closely observed for two reasons. The first one is that it represents the most important initiative with which Europe aims to assert its role as a global leader in space governance. Its relevance for the EU positioning as an actor with global interests and weight is therefore high. Should the Code be adopted and implemented, it would represent a major success for European foreign and security policy.

The second reason is that the EU CoC does protect important European interests, and does, with all its limitations, represent a step forward for space security. Its content is not innovative; essentially, the CoC commit subscribing States to a good behavior in their space activities, linked with some transparency and confidence building measures. Nonetheless, it has the merit of contributing to the development of an international culture of space sustainability, and its wide adoption would clearly signal an international consensus on the necessity of preserving outer space as a global common. Hopefully, the CoC will pave the way for subsequent developments of space governance.

This paper is organized in three sections. The first one provides an overview of the concept of space security, and explains its relevance for the EU. This section also highlights the main threats which menace orbiting objects. The second section briefly explain the genesis and development of the Code, and analyses the content of the CoC evaluating its main strengths and weaknesses. The last section discuss the possibilities of its adoption on the international level, and provide some recommendations in order to smooth the adoption process.

1. SPACE SECURITY: WHY IT IS RELEVANT, AND WHAT THREATENS IT

The most widely accepted definition of space security originates from the Outer Space Treaty[1], adopted in 1966 and entered into force in 1967. The Treaty establishes the rights of secure and sustainable access to, and use of, space and freedom from space-based threats. From these rights we can derive a definition of space security divided into the two components of security *in* space and security *from* space.

Security *in* space equals to the secure access to space, and secure use of space. This concept translates into the possibility of launching and operating satellites and other objects in outer space without being prevented or attacked by other parties. It also includes the security of other assets necessary for space operations, such as ground stations, receivers, etc. Security *from* space is a more ambiguous concept. The Treaty does not elaborate what effectively constitutes a space-based threat, and does not explicitly prohibit the development and deployment of space-based weapons.

Space security is clearly a prerequisite for the exploitation of outer space as a global common. Should Earth orbits become a prohibitive environment, that is, an environment in which satellites have an high probability of being damaged or destroyed, then mankind would not be able anymore to reap the benefits of space. Space-based services, in fact, can continue to be utilized only as long as their reliability can be reasonably assured. Governments, commercial operators and final users need to be confident that the service provided is not going to be interrupted, either intentionally or by accident.

The stakes are high. Space-based assets upholds today many functions of our society, and their use and support has revolutionized many activities and business areas. To make a list of space-based application would be an endless job, but it is relevant to make at least some examples. Satellite-based earth observation services are utilized in such diverse areas as weather monitoring, agriculture and forestry, environmental management, urban planning, oil and mineral exploration, cartography. Communication satellites allow digital broadcasting, high-speed internet connection, and ensure mobile communications even from the most remote areas. The GPS positioning and navigation system rapidly became a fundamental tool for facilitating air and

1 Formally the "Treaty on Principles Governing the Activities of States in the Exploration and Use of Outer Space, including the Moon and Other Celestial Bodies". The Treaty can be found in United Nations Treaties and Principles in Outer Space, 2002, http://www.oosa.unvienna.org/pdf/publications/STSPACE11E.pdf

maritime navigation, as well as a widely utilized instrument for private citizens.

Space-based applications are just as important, or maybe even more, in the fields of security and defence. Since the '50s, satellites in orbit were developed and deployed to perform invaluable intelligence and reconnaissance tasks for both the US and the USSR. The need to assure the legitimate right of overflowing foreign countries with intelligence satellites effectively prompted the Eisenhower administration to push for the establishment, at the international level, of the principle of "freedom of space"[2]. This paved the way for the subsequent development of the space sector at the global level.

As technology advanced rapidly in the following decades, military space-based applications spawned. Today space-based assets perform a much wider range of functions and have become indispensable assets for first world militaries. Satellites are used to allow secure communications and transmissions between units, to coordinate movements in difficult terrains, to guide missile to their target, and so on. Indeed, space-based assets are at the center of the so-called "revolution in military affairs", or the "network-centric warfare". The centrality of space for warfare was demonstrated in the first gulf war, when satellite based communications devices and the GPS navigation service allowed the US and allied army to operate and maneuver in an extremely difficult environment such as the Iraqi desert. It has indeed been argued that for first-class contemporary armed forces space power is not even an option, is a necessity[3].

The range of space based applications is just as important for the security sector. Satellite-based assets are utilized in every phase of an emergency, from the initial response to the damage control and the recovery phase. Just to give an example, earth observation applications allow rapid mapping and analysis of disaster struck areas, furnishing invaluable data to the rescue teams.

However, outer space is progressively becoming a more dangerous environment. The number of space-faring nations has surged in the last twenty years, and this expansion has brought about a number of previously

2 R. Cargill Hall, The evolution of US National Security Space policy and its legal foundations in the 20th century, in "Journal of Space Law", vol. 33, n.1, summer 2007.
3 Colin Gray, Global commons, Space Power and Strategy, in "Strategie dello spazio", ISPI, Quaderni di Relazioni Internazionali n. 8, October 2008

unheard of issues related to the governance of outer space and to the sustainability of space operations.

First of all, the increase of space activities provoked an exponential raise in the number of space debris, man-made objects of different size left in orbit as mission waste. These can be large objects such as inactive satellites or second stages of rockets, smaller broken components or fragments, or even minuscule flecks of paint. These debris, travelling at very high speed (7-8-Km/s in Low Earth Orbit[4]) are a tangible menace to any orbiting object. So far, operations in space have been conducted under the assumption that debris left in orbit would, sooner or later, fall down and burn up in the atmosphere. This theory, the "big sky theory", has been proved false, as debris remains in orbit for much longer than envisioned.

The menace represented by space junk was demonstrated in February 2009, when an Iridium communications satellite crashed into an inactive Russian military satellite, releasing a cloud of debris in a very crowded flight path. The accident, dubbed a "catastrophic event" by experts, was the first of such accidents to be recorded, and confirmed what scientists have been warning about in the last decade: if we keep on filling Earth's orbit with junk, we may very well be unable to fly satellites. The very same accident also underlined the concreteness of the related danger posed by overcrowded orbits. The most crowded one, the Low Earth Orbit (LEO) used for telecommunications satellites, hosts 459 satellites[5]. As the number of satellites increase, so does the probability of collisions.

A different factor of insecurity is related to the possibility of an arms race in space. As previously stated, outer space is heavily militarized, in the sense that it is heavily exploited for military means (20% of satellites in LEO are military assets[6]). However, it is not yet weaponized – there are no weapons in orbit, as they're both beyond current technological capabilities and politically very sensitive. Some kinds of anti-satellite weapons (ASAT), on the contrary, are relatively easy to manufacture, and both the US and the Soviet Union were able to develop them as early as in the '60s. The most basic ASAT weapon consist in a simple ballistic missile launched against a target in orbit: the mere kinetic force of the impact destroys the satellite.

---

4 Speech of Luca Del Monte at the Space Security 2010 conference.
5 Union of Concerned Scientists, Satellite Database, updated on July 2010, available at http://www.ucsusa.org/nuclear_weapons_and_global_security/space_weapons/technical_issues/ucs-satellite-database.html.
6 Ibid

Both superpowers, during the Cold war, chose to respect a *de facto* moratorium on the testing and development of ASATs, in order not to endanger the safety of their own precious but fragile satellites. Two recent developments, however, are increasing the possibility of a destabilizing arms race in space. The surge in the number of space-faring nations inherently increase the chance of a "rogue" behavior from countries determined to gain an edge against perceived security threats. Moreover, the high value of space-based assets for contemporary warfare makes satellites a valuable target for an offensive action. This is especially true for a low-tech military taking on a more modern enemy which make extensive use of satellites: targeting the opponent's space-based assets would be a cheap and very effective way to reduce the capability gap between the two.

2. THE EU CODE OF CONDUCT: AN EVALUATION

The EU draft Code of Conduct originates from an Italian initiative for an international Code of conduct, whose basis was laid by Italian experts in 2007. Italy fully appreciated the relevance of space security, but also recognized that times were not ripe for an international treaty on the subject. At the time, the Bush administration's National Space Policy[7] made it clear that the US rejected any arms control agreement or other agreements that might have restrained in any way American activities in outer space. Therefore, it was decided to put forward a less ambitious initiative, a soft-law instrument which would have more chances of being adopted by the international community[8]. The idea, in the form of a food-for-tough paper, was then transmitted to the EU working group on disarmament in March 2007, and was adopted as a European initiative[9].

In 2008 European diplomats started a first round of consultation with third parties such as the US, Russia, and China. It is reasonable to assume that inputs from these countries fed into the original draft CoC. However, it seems that countries favoring a proper international treaty, such as Russia and China, did not initially react well to the CoC. At the end of the year, a first draft version of the Code was finally approved by the EU Council and made public[10]. A second round of consultation, more extensive but just as secretive as the first one, was carried out in 2009 with several countries including Australia, Brazil, Canada, Japan, India and the Republic of Korea[11]. The result of this work has been a second version of the draft EU Code of Conduct, adopted on 27 September 2010 and presented in a meeting at the UN in mid October.

It is important to note that the Code should not be seen in a vacuum. It is based on, and complementary, to existing space laws and regulations. Moreover, it is explicitly meant to pave the way for a future international treaty on space security.

---

7 The full text can be found at GlobaSecurity.org, http://www.globalsecurity.org/space/library/policy/national/us-space-policy_060831.htm.
8 Presentation by the Italian Ambassador Carlo Trezza at the "EU conference on security in space, the contribution of arms control and the role of the EU, 21-22 June 2007.
9 Wolfgang Rathgeber, Nina Louisa Remuss and Kai_Uwe Schrogl, Space security and the European Code of conduct for Outer Space Activities, Disarmament Forum n.4, 2009, http://www.unidir.org/pdf/articles/pdf-art2909.pdf
10 Both versions of the CoC can be found on the Council website, http://www.consilium.europa.eu/showPage.aspx?id=1570&lang=EN.
11 Lucia Marta, The Hague Code of Conduct Against Ballistic Missile Proliferation: lessons learned for the European Union draft Code of Conduct for Outer Space Activities, ESPI Perspectives 34, June 2010, http://www.frstrategie.org/barreFRS/publications/autres/espi34.pdf.

The Code is based upon three principles which should uphold a more comprehensive approach to space and security. These principles are: freedom of access to space for peaceful purposes; preservation of the security and integrity of space objects in orbit; due consideration for the legitimate defence interests of States. Practically, subscribing States undertake to minimize any possibility of accidents, collisions or any harmful interference with other States' activities, and to refrain from any action which may damage or destroy (directly or indirectly) any outer space objects. The Code does allow an exception for the latter commitment; outer space objects can be destroyed if the action is conducted in order to reduce debris, or is justified by the right of self-defence, or is performed because of imperative safety considerations. The mention of the right of self-defence was not present in the first version, and has been probably added after consultation with third countries.

Thus the CoC commit States to refrain from the intentional destruction of any space object which may generate long-lived space debris. This provision is crucial, as it effectively rules out the testing of kinetic anti satellite weapons. The adopted formula allow to bypass one of the main obstacles on the issue of ASAT weapons, that is the difficulty of defining what effectively constitute a weapon.

However, the emphasis here is not on the destruction or incapacitation of satellites but on the creation of debris. Therefore, a kinetic ASAT test could theoretically be performed in particular situations - for example, against a satellite which is descending into Earth atmosphere. Moreover, any weapon testing which does not produce debris (such as laser or microwave attacks, or frequency interferences) should also be considered out of the scope of the CoC.

The Code also includes some cooperation mechanism. First of all the Code foresee the notification of potentially dangerous space activities to the affected subscribing States. Activities includes, but are not limited to, orbiting maneuvers, launches, collisions or break-ups, etc. States are expected to register space objects in accordance with the Convention on Registration of Objects launched to Outer space; more importantly, states are also expected to share, on an annual basis, information regarding their space policies and strategies including those related to security and defence activities in space, and to the prevention of space debris and collisions.

Finally, the Code of Conduct envision a consultation and an investigation mechanism. The consultation mechanism commit two States to work jointly and cooperatively in order to mitigate or eliminate any concern related to a subscribing State's space activities that may be expressed by another subscribing State. The investigation mechanism is only evocated in the CoC, and is to be defined in the future on a voluntary and *ad hoc* basis. It will be used to gain information related to incidents affecting space objects.

3. THE EU COC IN THE CURRENT SPACE SECURITY SCENARIO

The second draft version of the Code of Conduct has now been approved, and the CoC is ready to be presented to the international community for formal negotiations. But what are the actual chances of its adoption? And how can the EU facilitate the widest possible consensus?

In order to answer the first question, it is necessary to briefly discuss the latest developments in space, going back to three years ago. On January 2007, China performed the first ASAT weapons test in two decades, destroying one of its own weather satellites with a ballistic missile equipped with a kinetic energy warhead. The test provoked a cloud of debris, and sparked wide protests from the international community. Particular worries were expressed by the US and India. Washington has always been extremely sensible to the issue of ASAT because of US armed forces overreliance on satellites, while India, a developing space power and Beijing's regional rival, had been watching Chinese space activities with concern for a number of years. The Chinese test introduced the possibility of developing an Indian ASAT capability in the public discourse, with high level politicians and senior military officers publicly backing the idea[12].

In February 2008 the US responded to the Chinese move by shooting down one of its aging satellites, allegedly for security reasons – the satellite was spinning out of control. This can't be considered a test, since the technology utilized for the destruction of the satellite had already been proven (it was modified Aegis standard missile). Moreover, the US administration had briefed other countries well in advance, in order to explain its rationale and reduce the shock. However, the move was universally seen as a message to the Chinese. These worrisome developments evoked very clearly the danger of an upcoming arms race in space, especially if India decided to go ahead with the development of ASAT capabilities. This would have most certainly pushed Pakistan to do the same; and it's reasonable to assume Russia would have resumed its own testing, in order not to be left behind.

At the same time, however, another opposite trend was developing. Worries about a possible arms race triggered reactions in international forums, at the United Nations and of course in Europe. On January 2008, the UN General Assembly approved a resolution calling for transparency and confidence

12 Theresa Hitchens, Security in Space: Moving towards a new Cooperation Paradigm, in "Strategie dello spazio", ISPI, Quaderni di Relazioni Internazionali n. 8, October 2008

building measures in outer space activities[13]. On February, the UN Committee for Peaceful Use of Outer Space (COPUOS) set up an informal working group to draft proposed rules of the road for outer space activities. COPUOS was already reflecting on such measures after the publication of a working paper by its chairman Gerard Brachet in June 2007[14]. As explained above, since the beginning of the year the European Union started bilateral consultations on the first draft of its Code of Conduct, gaining some positive reactions. In February 2008, President Sarkozy strongly supported the ongoing efforts, signaling the willingness of the French EU presidency to develop the Code[15]. Moreover, it seemed that the international backlash against the Chinese test stunned the Chinese leadership, suggesting a more cautious approach from Beijing[16].

Another important change occurred with the election of Barack Obama at the Presidency of the United States. Obama's instinct for international cooperation translated very clearly into a new American approach to space, which was later made official policy with the last US National Space Policy, published in June 2010[17]. The new US policy basically reverted the Bush administration's approach to space, recognizing the mutual interdependence among the US and the other space-faring nations, and the need for international cooperation in order to maintain space as a viable environment. The fight against debris occupy a prominent place in the policy, along with the development of data sources and methods to create collision-warning mechanisms; both goals, recognize the policy, can be reached only in cooperation with other countries. Moreover, on the issue of arms control agreements Obama's space policy turn back to the traditional American view that such agreements can be useful, provided they are equitable and effectively verifiable, reverting the 2006 stance that any limit to US action in space is unacceptable.

The timing for the presentation of the EU CoC, therefore, seems to be quite good. No other disruptive ASAT test have been performed since 2008, and rhetoric regarding space weapons has been largely absent. The Chinese

13 UN RES 62/43, http://daccess-dds-ny.un.org/doc/UNDOC/GEN/N07/466/35/PDF/N0746635.pdf?OpenElement
14 Theresa Hitchens, COPUOS wades into the next great space debate, in "Bulletin of the atomic scientists", June 2008, http://www.thebulletin.org/web-edition/features/copuos-wades-the-next-great-space-debate
15 Laurence Nardon, report of the conference on "The French Presidency of the EU and the dynamics of European Space", July 2008, http://www.ifri.org/files/Espace/CRNardon.pdf.
16 Theresa Hitchens, Security in space, op. cit.
17 Can be found at http://www.whitehouse.gov/sites/default/files/national_space_policy_6-28-10.pdf

government seems to have chosen a less belligerent stance on the issue, India has not yet proceeded with the feared aggressive space program, and the US adopted a much more constructive space policy, entirely in line with the European view of the matter. Moreover, different initiatives have been brought forward in the UN – the last and most significant one is a draft resolution of the UN General Assembly on transparency and confidence building measures, introduced in October 2010 by Russia. Lastly, the mere fact that the EU was able to publish the second draft Code of Conduct can be seen as a positive signal; if there was substantial opposition from a major space-faring nation, the presentation would probably have been delayed. The formal negotiation and, hopefully, adoption of the Code would therefore be the last of several positive developments.

In order to smooth the process, it would be necessary to have the United States on board as soon as possible. The Obama administration has been engaged from the beginning of the drafting of the Code, and has repeatedly expressed its interest[18], but it has still not openly supported it. The EU should exercise pressure on its ally to live up to its own space policy and wholly adopt the Code. Open US sponsorship and diplomatic engagement would be helpful to gain support from other major Western-oriented space-faring nations such as Japan and Brazil. The combined weight of the EU, the US and other countries would put both Russia and China in the position of having to accept a serious discussion on the CoC or act as spoilers in front of the international community.

Secondly, the EU could promote an intergovernmental conference with interested countries in order to discuss the CoC. Other possible venues of negotiations, the Conference on Disarmament and COPUOS, offers advantages but even bigger disadvantages. Both these venues could convey a larger legitimacy to the Code of Conduct. However, the Conference on Disarmament is focused on security aspects, and COPUOS on more civilian aspects of the space issues; the CoC, instead, is about space governance as a whole. Moreover, UN forums and the Conference are often inactive (the Conference on Disarmament, in particular, has been paralyzed for almost 12 years), and there is no compelling reason to run the risk. An intergovernmental conference on the model of the one which led to the Hague Code of Conduct against Ballistic Missile Proliferation appears to be the most

18 See, for example, remarks by Deputy Assistant Secretary Frank Rose at the Secure World Foundation and UNIDIR conference on “Space security: next steps in TCBMs”, October 2010.

sensible option. Clearly, it will be crucial to obtain the participation of all of the most important space-faring nations.

It is way too early to bet on a successful adoption of the Code of Conduct; however, the premises are there. It is up to the European Union to muster the diplomatic will and strength needed to reach this very important goal.