

NATO and Space: Why is Space Relevant for NATO?

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In the context of the current debate on NATO's new strategic concept, the question of the role of space for the Alliance has become an issue. In Europe, space is increasingly used as a supportive tool for providing security. In a similar vein, NATO's "Allied Joint Doctrine for Air and Space Operations" highlights the potential of space assets in achieving the Alliance's security objectives. At the same time, the increasing reliance on space capabilities by the military, civil and commercial sectors also increases the likelihood of potential adversaries threatening space assets. Thus, if NATO wants to achieve the optimal level of support from space, all space capabilities and systems, as well as the means to protect them, should be integrated into future military planning. In the light of the debate on NATO's strategic concept, the objective of this paper is twofold: first, to demonstrate the usefulness of space applications to NATO's security objectives, drawing on the example of maritime surveillance ("space as a force enabler"); and second, to indicate the possible vulnerabilities of space applications ("space as the next high ground") without promoting an arms race in space. Space applications cannot be left aside when discussing the Alliance's future and Europe should take an active part in this debate, in order to safeguard its interests.

1. Background

While seeking to answer the question why space has a relevance to NATO, the objective of this research paper is twofold: first, to show the potential of space applications for NATO's security objectives ("space as a force enabler") and second, to indicate the threats and vulnerabilities of space applications ("space as the next high ground" – space control). Two arguments are thus put forward: (1) space is relevant for NATO because it is a force enabler and (2) space is relevant for NATO because it could become the next high ground. At the end, recommendations are developed with regard to integrating space applications into NATO's joint operations.

In the post-Cold War era, the definition of "security" has been re-defined. As a result of the changing nature of threats to security (from traditional State-to-State territorial attacks, to non-traditional functional threats from non-State actors¹) security threats are now commonly

distinguished in external, (traditional inter-border threats) and internal (non-military threats coming from non-State actors within a country's territory). Since 9/11, it has been frequently emphasised that such a distinction is becoming blurred with regard to the instruments needed to provide security.

The most important innovation within NATO was its modification to include non-defence operations that are not based on Article 5 of the North Atlantic Treaty. Consequently, NATO has aligned itself to the new security challenges after the fall of the iron curtain through a change in its role, which can be characterised as moving "from collective defence to collective security".²

Disruptions: A new D-drive for the EU. Chailot Paper No. 83. Ed. Antonio Missirolì. Paris: Institute for Security Studies, 2005

Varwick, Johannes and Woyke, Wichard. NATO 2000. Transatlantische Sicherheit im Wandel. Augsburg: Leske + Budrich, 1999. 30-1

Varwick, Johannes and Woyke, Wichard. Die Zukunft der NATO. Transatlantische Sicherheit im Wandel. 2nd Edition. Augsburg: Leske + Budrich, 2000. 127.

² Clement, Sophia. "The Balkans and Beyond: The European Perspective on Future Regional Stability." NATO and Europe in the 21st Century: New Roles for a changing Partnership. Wilson Center's East European studies and West European Studies, 2000: 65-9.

¹ For a detailed account on the development of the concept of security consider Sundelius, Bengt. "Disruption - Functional Security for the EU." Disasters, Diseases,

Given the need for innovative tools to counter non traditional security threats, space applications are increasingly used as instruments in the provision of security in Europe, including for NATO. While previously air power has been a decisive factor in the Alliance's planning, today it is space that is gradually assuming this role.³

With the end of the Cold War, more and more States entered the field of space activities, making outer space an ever more contested environment. At the same time, societies' dependence on space applications for their functioning has increased. Amongst them, communication satellites provide telephony, real time broadcasting (e.g. Olympics, world cup coverage), video conferencing and faster, more secure banking and financial transactions. Navigation systems enable precision farming and precise package tracking, weather satellites provide data and images critical to shipping, agriculture and air travel, while other space systems enable food management, monitor air quality and support urban planning. They also bridge global, regional and national social inequalities by providing broadband internet access and allowing for e-learning in rural areas. Space also enhances global situational awareness. Remote sensing is used to provide information on treaty violations and verification, monitoring situations related to disasters, pollution, resource availability, civil unrest, refugee migration and population/urban growth. It can be used for monitoring environmental problems and space-based applications and it can help to understand climate change, extreme weather events, and ecosystem changes. Measurements and observations from space can help marine and forest management, as well as enforcing environmental regulations. Thus, today's society already depends on satellite applications in every day life. Additionally, space is increasingly being used as a supportive tool in the provision of security. In a similar vein, NATO's "Allied Joint Doctrine for Air and Space Operations" highlights its potential for the achievement of the alliance's security objectives.

In order to understand the impact of space to NATO and to its Member States, the Alliance's Space Operations Assessment refers to the importance of understanding basic space economics. The Space Foundation for example, estimates that global space activities in 2007

amounted to \$251 billion and were dominated by U.S. commercial and government spending (with the latter accounting for nearly a quarter of the total space-related expenditures). European public space spending, on the other hand, is the second largest in the world, representing nearly 10 % of all public investment in space.⁴

2. Space as a Force Multiplier

The increasing reliance on space applications and the emerging global challenges and threats, place new demands on space capabilities.⁵ Given today's multi-polar world, security providers face a very different security and threat environment than during the Cold War. At the same time, during the Cold War, the U.S. and the Soviet Union had agreed not to attack each other's space assets, which provided for a certain degree of transparency given that both were the sole actors in space.

Characterising conflicts as fundamentally unpredictable, NATO's Allied Joint Doctrine stresses the added value of using technology. Accordingly, NATO's operations are already dependent on space applications as NATO comes to rely on it for global situational awareness, decision superiority and precision engagement.

In spite of NATO's dependence on space operations, the Alliance is still missing a holistic approach to the subject.

Space applications can be understood as force multipliers or enablers. The following section will rely on the EU's experiences and will give four examples of areas where this is the case: in external security missions, in damage and impact assessment during post-crisis management, in the fight against piracy and in providing internal security, i.e. against non-traditional threats such as terrorism, natural disasters etc.

In External Security Missions

European Union external security missions, such as the EU Military Crisis Management Operations EUFOR Chad / RCA (from French: Central African Republic) rely on satellites for secure communications between the Operations Headquarters (OHQ) and units deployed on the

³ <http://wwics.si.edu/ees/special/2000/clemen.pdf>
cf. Hoof, Jan A. H. van. "Coalition Space Operations – A NATO Perspective." High Frontier 6.2 (2010)
Single, Thomas. "Assuring the Space Domain – Strategically Important to NATO." JAPCC Journal 10 (2009).

⁴ NATO. NATO Space Operations Assessment. Kalkar: JAPCC, 2009. 14.

⁵ McLaughlin, Kevin. "Operationally Responsive Space Office." Presentation. 6 July 2007. 28 Aug. 2009
<http://www.responsivespace.com/ors/reference/McLaughlin.pdf>

field, as well as on satellite imagery for mapping in support of their mission, especially considering the local absence of terrestrial communications infrastructure and the large dimensions of the theatre of operations.

NATO is relying on space applications to support its ISAF operations in Afghanistan. These range from communications, position, navigation and timing, environmental sensing, missile warning, personnel recover and infrared remote sensing, to counter space operations. Space capabilities are however not fully integrated and utilised as a result of, first the lack of NATO strategy to space applications, second the resulting limited exposure of space capabilities prior to the deployment and third the limited number of personnel among the ISAF staff with space expertise.⁶

In Damage and Impact Assessment

Satellite imagery is also used for damage and impact assessment. Regular monitoring of crisis-struck areas (or those where a crisis is expected) and the establishment of a database, such as the RELEX Crisis Platform of the European Union Commission, serve as the basis for this. Areas for regular monitoring are prioritised and a timeframe for monitoring is assigned. Prioritisation is conducted on the basis of early warning indicators such as intelligence sources. Satellite imagery collected prior to a crisis can allow for damage and impact assessment through change detection techniques, help to identify critical infrastructure, transportation or evacuation routes and is used as a basis for emergency response planning.

In the Fight Against Piracy

Space-based applications are also used for maritime surveillance and the fight against piracy. They can be used in combination with other available in-situ surveillance systems to improve the overall maritime situational awareness, or to monitor ports and coastal areas, track human, drug and other trafficking or identify pirate skiffs, hijacked vessels and illegal fishery.

Satellite applications fit particularly well to the geographic and thematic diversity of maritime activities under monitoring and surveillance.

Geospatial intelligence products produced by

⁶ Ibid. 30-31; 52.

the European Union Satellite Centre (EUSC) are currently used in the counter-piracy mission EU ATALANTA NAVFOR. The Operational Head Quarters in support of the ATALANTA NAVFOR mission has tasked the EUSC to analyse imagery and report on key ports and specific coastal areas, with the objective of gaining understanding of the current infrastructure and service ability and to give an outline of possible access/regress routes that are important to the operation. In detail, EUSC is continuously monitoring pirate operating bases, the Somali border and possible terrorist training camps. It is identifying potential pirate camps on the Somali coastline and offshore islands and conducting battle damage assessments of Somali towns. Findings are issued in the form of Imagery Intelligence reports or Digital Geographic Information. EUSC is also analysing known pirate operations bases in Somalia with an eye to: the infrastructure of the base, significant buildings and structures, government or military installations, maritime facilities and the classification of fishing vessels in order to analyse how much these infrastructures support pirate operations. Space applications can be further used to track pirate skiffs or hijacked vessels, intercept and track mobile phone conversations, radio signals and microwave transmissions of pirates.

Other space-based counter-piracy missions are performed by intelligence satellites that use multiple types of Earth observation sensors (image surveillance satellites, signal intelligence etc.). They include the electronic monitoring of telecommunications, in combination with imagery processing techniques (change detection techniques and geospatial intelligence, a method combining mapping, charting, imagery analysis and imagery intelligence with all available data).

In addition to this, navigation signals can be used for tracking and positioning.⁷ Several reporting regimes exist already on an international or multinational basis such as the Automatic Identification System (AIS) required by the International Maritime Organization's International Convention for the Safety of Life at Sea (SOLAS), Long Range Identification and Tracking of Ships, port notifications, hazardous material reporting and the West European Tanker Reporting System. They allow for an overview of cooperative and non-cooperative vessels and thus narrow down the number of

⁷ Remuss, Nina-Louisa. "Space Applications as a Supporting Tool Countering Piracy – Outline for a European Approach." ESPI Report 29. Vienna: ESPI, Oct. 2010.

vessels potentially conducting illegal activities. Space-based imagery can also be used for the monitoring of ports and coasts to counter illegal immigration and to protect critical infrastructures.

In Providing Internal Security

The EU has recently also started to conduct research into the reliance on space applications for internal security missions, such as border and transportation security, as well as for critical infrastructure protection through its Framework Programme for Research and Technological Development (FP 7).

Intelligence satellites can be used for crisis prevention, for detecting terrorist camps, or for risk mapping during environmental disasters (e.g. floods). Satellite imagery can also be used for emergency mapping of critical infrastructures such as energy facilities (pipelines, oil refineries etc.), ports and communication facilities. Both SatCom and SatNav are used in the transportation sector to track goods and notify related authorities of the transportation route, especially in case of unexpected en route changes, or interference with the containers' contents.⁸

3. Space Could Be the Next High Ground

The increasing reliance on space applications for every day activities, as well as for providing both internal and external security, inherently raises the likelihood of attack by an adversary. Space capabilities are based on complex systems, including ground stations, launch facilities, satellite production sites, checkout and storage facilities, communication links, user terminals and spacecraft (both manned and unmanned), which all offer potential targets.⁹

Space as a Contested Environment

Today, the space environment is increasingly perceived as contested because of the increasing number of space actors that make it a crowded and competitive environment and the threat of orbital debris, to mention just two examples.

In today's highly contested space environment,

having a qualitative advantage in space assets that is not secured does not mean much. Especially since space applications are now increasingly available. Iraq has made use of GPS jammers during the second Gulf war, Iran uses SATCOM jammers against commercial satellites and the Chinese Anti-Satellite Test (ASAT) of January 2007 further prepared the global space community for the eventuality of losing satellite capabilities and having to replace them on a short notice.¹⁰ In addition to this, everyone can now use commercial EO services, including Google Earth, for target identification.¹¹

There is an emerging perception that space applications constitute a part of critical infrastructure that requires adequate protection.

Responsive Space

In general, there is a growing realisation of the need for new capabilities with:¹²

- Increased flexibility and adaptability to respond to urgent needs.
- The ability to rapidly infuse technological and operational innovation.
- The ability to rapidly augment or reconstitute space systems.

Considering space assets as critical infrastructures, the U.S. has started an initiative to make space assets more responsive to user requirements and arising security needs, which became known as the Operational Responsive Space (ORS) concept. In a similar vein, ESA is currently exploring new potential concepts in the realm of space and security, always with respect to its Convention, the European Space Policy (ESP) and the recent Resolutions adopted by the Space Council and by the ESA Council at a Ministerial level. One of these is a project formerly known as GIANUS (Global Integrated Architecture for Innovative Utilisation of Space for Security), which aims at meeting the users community's needs with an eye to the increased dependence of the EU on space assets, to the need for tools in the theatres of operations and to the increased opportunities arising from projects and FP7 in particular. It is currently

⁸ Remuss, Nina-Louisa. Space and Internal Security – Developing a Concept for the Use of Space Assets to Assure a Secure Europe.” ESPI Report 20. Vienna: ESPI, 2009.

⁹ To find out more about the motives and spectrum of possibilities to attack space assets consider Remuss, Nina-Louisa. “The Need to Counter Space Terrorism – A European Perspective.” ESPI Perspectives 17. Vienna: ESPI, 2009.

¹⁰ Doggrell, Les. “The Reconstitution Imperative.” 1 Dec. 2008. Air & Space Power Journal. 20 Nov. 2009 <http://www.airpower.maxwell.af.mil/airchronicles/apj/apj08/wi08/doggrell.html>

¹¹ NATO. NATO Space Operations Assessment. Kalkar: JAPCC, 2009. B-12.

¹² McLaughlin, Kevin. op. cit.

designed to contain a responsive space element.

Offensive and Defensive Operations

The changes in the Earth and space security environment following the end of the Cold War have given rise to a debate on distinguishing between offensive and defensive space operations. All operations which deny, degrade, disrupt, destroy or deceive an adversary's space capabilities or access to them are called offensive space operations.¹³ The measures taken to preserve space capabilities, or restore their services are referred to as defensive space operations.¹⁴

While most publications accept that space is the next "high ground",¹⁵ they usually refer to States as the main actors and neglect the possibility of non-State actors,¹⁶ such as terrorist groups to get involved in space. In the past, a series of jamming and piracy events occurred in the commercial satellite sector. First, the mobile satellite communication signal provided by Thuraya Satellite Telecommunications¹⁷ was jammed from three widely-separated locations inside Libya. Secondly, Sri Lanka's Tamil tigers (LTTE) hijacked the Intelsat Ltd. Intelsat-12 satellite in geosynchronous orbit to beam their propaganda across the Indian subcontinent. While Intelsat continuously tried to interrupt LTTE's pirating, LTTE was able to continue its satellite piracy for 2 years. Thirdly, two similar events happened in China, when the Falun Gong spiritual movement overrode in June 2002 the broadcast signals of nine China Central Television stations and 10 provincial stations, replacing the programming with their own content, as well as when they disrupted in 2004 AsiaSat signals for four hours. These are only some examples.

In Europe, one can distinguish several efforts and initiatives of strategic and operational nature aiming at gaining awareness of the space environment and preventing harmful interferences with satellites. Among these are

the European Draft Code of Conduct, the concept of Space Traffic Management, efforts to establish a European Space Situational Awareness, which consists of understanding and maintaining awareness of the Earth's orbital population, the space environment, and possible capabilities and initiatives considering space assets as a critical infrastructure.

Given the increasing importance of space applications and systems for security, any space policy needs to adapt to the post-Cold War security environment, which is characterised by threats from non-State actors.

4. NATO and Space Today

In order to recommend necessary future steps, this section briefly outlines NATO's current space operations and its position among the other organisations providing security in Europe.

NATO's Current Space Operations

NATO has been active in space since the 1960s, starting with its own communications satellites, weather and intelligence activities. The alliance has had an involvement in many of the space mission areas and operated the NATO I, II, III, and IV series of communications satellites. For the most part, NATO relies on national and civil space capabilities to accomplish its mission.¹⁸

Globally, more than twenty-six nations and nine organisations operate more than five satellites each. Out of these, fifteen nations are NATO members (eleven countries operate more than five satellites and another four nations operate less than five satellites).¹⁹ Hence, NATO nations are important actors within the global space community.²⁰

There is currently no NATO space policy, no military space strategy, no space doctrine document, and no space Joint Tactics, Techniques and Procedures (TTPs) documents. Mission areas such as offensive and defensive space and space surveillance are not addressed. Strategic and operational planners face the challenge of finding appropriate guidance on directing the integration of space capabilities.

¹³ NATO. "Allied Joint Doctrine for Air and Space Operations." AJP3-3(A) of 5 Nov. 2009. 1-7.

¹⁴ Ibid.

¹⁵ Fjetland, Michael. "Next: Space Terrorism?" 2003. 1 Sept. 2008. www.borrull.org/e/noticia.php?id=21388 who only refers to States when discussing different options of weaponisation in space.

¹⁶ As in Chun, Clayton K. S. "Striking Out to Space. Technical Challenges to the Deployment of ASAT Weapons." *New Challenges in Missile Proliferation, Missile Defense, and Space Security*. Ed. James Clay Moltz. Monterey Institute of International Studies: July 2003. 24, who only refers to countries when discussing options for satellite interference.

¹⁷ <http://www.thuraya.com>

¹⁸ NATO. NATO Space Operations Assessment. Kalkar: JAPCC, 2009. 21.

¹⁹ NATO nations in space are Canada, Czech Republic, Denmark, France, Germany, Greece, Italy, Luxembourg, The Netherlands, Norway, Portugal, Spain, Turkey, United Kingdom, United States.

²⁰ Ibid. 8.

Given the lack of military requirements from the alliance, member nations are developing their own space capabilities for national defence and security needs. Cooperation and planning would allow NATO to develop comparatively more capabilities out of the few resources that its Member States devote to space systems. Moreover, there is no overarching strategic framework for long-term space capabilities acquisition and research, or direction to the Member States on required space capabilities.²¹

NATO's Role

Considering space as a force multiplier, the question arises why NATO should build space applications, if the EU, ESA and its Member States are already doing so. The answer lies in the security architecture in Europe. What role does NATO have in the provision of security in Europe, considering the other existing organisations in this field such as the OSCE, and the EU? Initially each of these organisations were set-up to fulfil one particular objective: NATO secured Europe from the East, while the European Coal and Steel Community (ECSC) fostered economy and the CSCE (now: OSCE) was established with the objective of promoting a rapprochement between the Warsaw Pact and Western European (including the non-aligned and neutral) countries.

After the end of the Cold War, in the context of enhancing cooperation among organisations and avoiding duplication of efforts, the question about the competencies of each of these players arose, as they had lost their primary objective of securing Western Europe. New roles had to be founded with the demise of the Soviet threat and the end of the Cold War. With the EU having established its own security and defence policy, a danger of competition and duplication between NATO and the EU emerged.

However, a "division of labour" was increasingly being observed between military action responsibilities (NATO) and political action to be discussed within the framework of the EU. The EU has found its own niche by emphasising soft power and civilian crisis management, while NATO has remained the embodiment of military force and defence. This division of labour allowed for a balanced cooperation, encompassing common consent and mutual understanding. Given their different respective fields of action, both NATO and the EU need space applications to "multiply" their specific

"force". Therefore, each organisation should take the other's assets into account and plan for relying on these additional capabilities if needed. Agreeing on a distinct role for both of these actors will be even more important when justifying the new structures towards Member States of both organisations, who might not immediately see the added value.

5. How Should NATO Proceed With Space Operations?

To prepare the Alliance for the challenges stemming from space related issues, the following four steps seem appropriate.

Develop a NATO Space Policy

By developing a NATO space policy, NATO could prove to be another viable option in addition to ESA for the cooperation among nations in the field of space.²² The EU, civil space agencies and Member States are moving forward on space. Without NATO taking action in this field, ESA and EU have begun to address security and defence applications. By not developing a holistic approach to space operations, NATO risks becoming marginalised, as Member States continue to develop space capabilities and modernise existing ones by changing the existing organisational structures.

There is an urgent need for NATO to clarify the potential use of space capabilities by the Alliance and to provide input to the development of the next generation of space assets.

Thus, NATO and its Member States should:

- Agree to a common set of military objectives, operational requirements and funding schemes.
- Create a cooperative architecture that links civil and military space capabilities and allows their access by Member States.

This NATO space policy should rely on existing NATO documents, such as the strategic vision document of 2004.²³ Guidance is also provided by the space governance recommendations put forward by the UN Office of Outer Space Affairs (UNOOSA), the UN Committee on the Peaceful

²¹ NATO. NATO Space Operations Assessment. Kalkar: JAPCC, 2009. 22.

²² Ibid. 18.

²³ Bi-SC Strategic Vision: The military Challenge, August, 2004 quoted in NATO. NATO Space Operations Assessment. Kalkar: JAPCC, 2009. 21.

Uses of Space (UNCOPUOS), the European Commission and ESA, as well as by national and military space policies and strategies that affect NATO space operations.²⁴ Finally, a future NATO space policy should provide the basic guiding principles for its space operations, while at the same time allowing for international cooperation in this field²⁵.

Above all, any future NATO space policy should lay down its governance structure. Key points to consider have already been pointed out by the NATO Space Operations Assessment:

- Personnel with space background and expertise should be placed in strategic, operational and tactical headquarters.
- Training must be conducted as a routine part of the normal training cycle and it must not be deferred until the outbreak of operations.²⁶
- Classes on space capabilities should be incorporated in military education courses, including Member States' and NATO Staff Colleges, in order to counter the general lack of awareness and education on space operations.
- Coordination on a strategic political level is needed in order to use national space assets to their full potential.

In addition to the above, NATO's space policy should also respond to the following questions:

- How can NATO assure access to the space domain and make better use of it?
- What institutional structure is required to fully exploit the potential of space?
- In what way can NATO contribute and benefit from the European SSA system?
- How can Galileo be of use to the Alliance?
- How can NATO cope with the rising security requirements in the development of satellite missions and space-based applications?
- Which process should be developed in order to identify and formulate NATO's requirements for space assets?
- How can these requirements be incorporated into a future European

programme on Responsive Space?

- What could be NATO's role among the European security organisations?

Increase the level of Cooperation With Other Organisations and Avoid Duplication

In general, competition of efforts among actors in the field of space security should be avoided. The European Union, the European Space Agency (ESA) and NATO Member States are already pursuing their space interests and acquiring different capabilities. NATO needs to find a role among the security related international organisations that develop space applications for the provision of security.

However, it has been shown in other cases that the above mentioned organisations can work together on a complementary rather than a competitive basis, based on a clear division of duties among them. The EU "carve[d] out its own niche"²⁷ by focusing on soft power, civilian-post crisis management and conditionality²⁸. Consequently, de-coupling and re-opening the discussion on burden sharing should be avoided.²⁹

EU space capabilities should be seen as complementary rather than competitive to NATO's structures.

Considering the example of the division of labour in external security missions between NATO and EU, a similar understanding should also be established in the development of space capabilities in order to avoid unnecessary duplications. Such a policy would require NATO's willingness to place its assets (including U.S. operated equipment) at the disposal of European-only operations. Building upon previous cooperation in the area of security, NATO, the EU and ESA should become companions and create a win-win situation for all.

Space activities in Europe are carried out by multiple actors at different levels: first the overall European level that is represented by the EU

²⁴ A list of some of the space policy documents can be found among the references at annex M of NATO. NATO Space Operations Assessment. Kalkar: JAPCC, 2009. 22.

²⁵ These have already been sketched out in the Annex to the NATO Space Operations Assessment (H-1 – H-6). The NATO Space Operation Assessment has also done a first step in formulating a NATO military space strategy by enumerating tenets which can be used as building blocks. Ibid. Annex I.

²⁶ Ibid. 22.

²⁷ Tanner, Fred. "Conflict Management and European Security: The Problem of Collective Solidarity." The Geneva Center for Security Policy. Publication for Workshop 4: Toward the 21st Century: Trends in the Post-Cold War International Security Policy. 1st Conference of the PfP Consortium of Defense Academies and Security Studies Institutes, 19-21 October 1998, Kongresshaus Zürich, Switzerland. 2.

²⁸ The provision of certain aid by the EU is made dependent on the fulfilment of a number of conditions by the country in question.

²⁹ Clement, Sophia. op. cit. 69.

(supranational), secondly the intergovernmental organisations' level that is represented for example by ESA and EUMETSAT (multilateral), and thirdly the Member States' level with their own space actors (national). This situation has the potential to create further challenges for the development of NATO's space policy, since the Alliance does not only have to define its role and relations with security providing organisations, but also with those involved in wider space activities such as ESA, EUMETSAT etc.

Establish a Space Operations Coordination Centre at NATO Headquarters

In order to optimise the use of existing capabilities, reduce effort duplication and ensure interoperability among the different space systems and services, there should be an increased level of cooperation between European countries, NATO and other European organisations. NATO should therefore actively engage with European governments, EU, ESA and EDA, in order to define the security and defence requirements of the existing and planned Space systems.³⁰ In order to do so, NATO should create a single point of contact that guarantees oversight and coordination in areas such as technology research and development, or institutional relations among the various international organisations and Member States. Establishing a NATO space office within the Alliance's Headquarters (perhaps in the form of a Space Operations' Coordination Centre) could potentially address this requirement.³¹

Ensure Integrated Military Planning

Given the increasing reliance of the military, civil and commercial sectors on space capabilities and the consequent likelihood of a threat to

space assets by potential adversaries, all space capabilities and systems (including the means to protect these capabilities) must be integrated into any future NATO military planning. Such a step would be indispensable, if NATO is to achieve an optimal level of operational support from space applications. In particular, air and space operations' integration should be promoted. Within this framework, NATO could provide professional education and training on space and its available capabilities.³²

Finally, the Alliance should work to improve national space capabilities' integration, both in existing and future systems, as well as to improve procedures on data collection, management, sharing and dissemination among the various stakeholders. In this respect, NATO could identify areas of technological interest for each country and develop a long-term plan to deliver capabilities and effects.³³ At the same time, Alliance members should be able to protect their space assets.³⁴

NATO's main challenge would be to incorporate the use of its Member States' national assets into its planning.

Concluding Remarks

As it has been shown, in the context of the current debate on NATO's new strategic concept the question of the role of space for the Alliance cannot be neglected. The current debate can be seen as a window of opportunity for NATO to achieve the optimal level of support from space. Europe should take an active part in this debate in order to safeguard its own interests and to guarantee a successful cooperation with NATO in the provision of security.

³⁰ Ibid. 52.

³¹ Ibid. A-1.

³² Ibid. 35.

³³ NATO. NATO Space Operations Assessment. Kalkar: JAPCC, 2009. 35.

³⁴ NATO. "Allied Joint Doctrine for Air and Space Operations." AJP3-3(A) of 5 Nov. 2009. 6-1.



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