



NORTH ATLANTIC TREATY ORGANIZATION

NATO's overarching Space Policy

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INTRODUCTION

1. Space is increasingly important for the Alliance's and Allies' security and prosperity. Space brings benefits in multiple areas from weather monitoring, environment and agriculture, to transport, science, communications and banking. The use of space has greatly enhanced Allies' and NATO's ability to anticipate threats and respond to crises with greater speed, effectiveness and precision. The evolution in the uses of space and rapid advances in space technology have created new opportunities, but also new risks, vulnerabilities, and potentially threats for the Alliance's and Allies' security and defence. Today, access to, and use of, space is no longer the prerogative of a few nations that are technically capable of launching and operating a spacecraft. Space technology and services have become more readily accessible, cheaper and more capable. Most space capabilities are dual use, serving civilian/commercial as well as military purposes, often at the same time, further adding to the complexity of the space domain¹. In security and defence terms, space is increasingly contested, congested and competitive and requires the Alliance to be able to operate in a disrupted, denied and degraded environment. Allies' space capabilities could become a high priority target given the advantages that space systems provide in conflict and given Allies' dependence on these systems to enable operations.

SPACE-RELATED THREAT ENVIRONMENT

2. Space is a unique physical domain which is challenging Allies' traditional perceptions of time, distance and geography. Potential adversaries are developing, testing and operationalising sophisticated counter-space technologies that could threaten Allies' access to, and freedom to operate in space. These technologies comprise a diverse range of counter-space capabilities to disrupt, degrade, deceive, deny, or destroy capabilities and services on which Allies – and the Alliance – might critically depend. Potential adversaries are increasing their own use of space, thereby extending their ability to project power over greater distances, with increased precision, speed and effectiveness. They are also using space capabilities to track NATO and Allies' forces, exercises, and other activities. Satellite navigation and commercial services are also used for planning and targeting by potential adversaries, including by non-state actors.

The capabilities being developed by potential adversaries could be used against the Alliance in order to, inter alia:

- a. Hold space assets at risk, thereby complicating NATO's ability to take decisive action in a crisis or conflict;
 - b. Deny or degrade Allies' and NATO space-based capabilities critical to battlespace management and situational awareness and the ability to operate effectively in a crisis or conflict;
 - c. Create impacts on Allies' space systems that are damaging or disruptive to economic or public life and violate the principle of free use of space, yet fall below the thresholds of threat of force, use of force, armed attack or aggression.
3. Space-related threats and risks can vary in form and intensity, ranging from low-end, non-kinetic systems which create reversible effects (such as jamming of communications or GPS signals), to non-kinetic and high-end kinetic capabilities that produce irreversible effects and which may result in significant and adverse long-term impacts to the space environment. In particular, the latter can produce space debris, leading to reduced accessibility and usability of orbits and collateral damage. It is worth noting that both space-based (satellites) and ground-based (ground stations and launchers) segments, as well as the links between them, can be the targets of such capabilities. In addition to man-made risks, space systems are also vulnerable to natural hazards and accidents.
4. A number of nations are developing counter-space and anti-satellite systems². Potential adversaries in particular are pursuing the development of a wide range of capabilities from non-kinetic (such as dazzling, blinding and jamming of space assets) to kinetic destructive systems (such as direct-ascent anti-satellite missiles, on orbit anti-satellite systems, and laser and electro-magnetic capabilities). Such space destruction, disruption, degradation and denial capabilities are further exacerbated by the susceptibility of space to hybrid approaches and the associated difficulty of attributing harmful effects to space systems. Some threats, such as signal jamming and cyber-attacks, can potentially be caused also by non-state actors, including terrorist organisations. Many threats to Allies' space systems originate in the cyber domain and are likely to increase.

PRINCIPLES AND TENETS

5. This overarching NATO space policy is based on a number of principles and tenets which are consistent with those of the Alliance's overall posture:
- a. Space is essential to coherent Alliance deterrence and defence;
 - b. Space is an inherently global environment and any conflict that extends into space has the potential to affect all users of space. Even in cases where NATO is not involved in conflict, Allies' space systems could be affected;
 - c. The free access, exploration and use of outer space for peaceful purposes is in the common interest of all nations. NATO and Allies will continue to carry out all activities in outer space in accordance with international law, including the UN Charter, in the

- interest of maintaining international peace and security and promoting international cooperation and understanding³;
- d. Space is not subject to national appropriation by claim of sovereignty⁴;
 - e. Allies will retain jurisdiction and control over their objects in space⁵ as well as full authority and sovereignty over their space capabilities and resources;
 - f. Considering that the Alliance is not aiming to develop space capabilities of its own⁶, Allies will undertake to provide, on a voluntary basis and in accordance with national laws, regulations and policies, the space data, products, services or effects that could be required for the Alliance's operations, missions, and other activities;
 - g. NATO is not aiming to become an autonomous space actor. NATO will seek to complement and add value to the work of Allies and to engage with other relevant international organisations, as appropriate, avoiding unnecessary duplication of effort.

NATO'S APPROACH TO SPACE

6. Key roles. Consistent with the principles outlined above, NATO's overall approach to space will focus on the following key roles:
- a. Integrating space and space-related considerations into the delivery of NATO's core tasks: collective defence, crisis management and, where appropriate, cooperative security;
 - b. Serving as a forum for political-military consultations and information sharing on relevant deterrence and defence-related space developments, with a view to informing the Alliance's situational awareness, decision-making, readiness and posture management across the spectrum of conflict. Such consultations could cover threats, challenges, vulnerabilities and opportunities, and take into account the development of legal and behavioural norms in other fora;
 - c. Ensuring effective provision of space support and effects to the Alliance's operations, missions and other activities;
 - d. Facilitating the development of compatibility and interoperability between Allies' space services, products and capabilities.

In support of these key roles, NATO will pursue a number of lines of effort, as outlined below.

7. Space support in operations, missions and other activities. Continuous and secure access to space services, products and capabilities is essential for the credibility of the Alliance's posture, management of that posture, and the conduct of the Alliance's operations, missions and other activities. NATO requires space systems in the following functional areas:
- a. Space situational awareness is required to understand the operational environment, which enhances the Alliance's strategic anticipation and resilience. It is a prerequisite to identify risks and threats in space, from space, and to space, and to propose mitigation measures;
 - b. Intelligence, surveillance and reconnaissance requires space capabilities for strategic, operational and tactical assessment, situational awareness and to support decision-making and planning;

- c. Space-based monitoring of the atmospheric, oceanic and space environments is important for planning and execution of NATO missions and operations;
 - d. Satellite communications are essential in all NATO missions. NATO operations require the availability of satellite communications to efficiently and effectively support consultation, command and control;
 - e. Positioning, navigation and timing is essential in all NATO missions. It enables precise positioning and allows for the synchronisation of effort across the full spectrum of military operations;
 - f. Shared early warning is a capability that contributes to deterrence and defence by providing persistent monitoring and warning of missile events and other services.
8. NATO will identify and, if necessary, develop appropriate mechanisms, based on voluntary participation, to fulfil and sustain requirements for space support in NATO operations, missions and other activities in the above functional areas. Allies' capabilities, and, if necessary, trusted commercial service providers should be leveraged to meet these requirements in the most secure, efficient, effective and transparent manner.
9. In November 2019, NATO declared space as an operational domain, which will help to ensure a coherent approach to the integration of space into NATO's overall deterrence and defence posture. In October 2020, NATO established a NATO Space Centre⁷ at Allied Air Command in Ramstein, Germany. A NATO Space Centre of Excellence is also being established in Toulouse, France.
0. Space domain awareness. NATO is developing space domain awareness through a number of actions:
- a. Raising general political and military awareness across the Alliance about NATO's reliance on space and the importance of the Alliance's continuous and secure access to the space services, capabilities and effects it requires;
 - b. Building a shared understanding of the evolving space-related threats and vulnerabilities, including through continued information and intelligence sharing among Allies, as well as fusion and assessment of this material at NATO level;
 - c. Continuing voluntary sharing of information and data on relevant national space activities.
1. Deterrence, defence and resilience. Space must be seen as an integral part of the Alliance's broad approach to deterrence and defence, drawing upon all of the tools at NATO's disposal, to provide the Alliance with a broad range of options to be able to respond to any threats from wherever they arise. To this end:
- a. Considering that Allies have recognised that space is essential to the Alliance's deterrence and defence, and to a coherent Alliance posture, the Alliance will consider a range of potential options, for Council approval, across the conflict spectrum to deter

- and defend against threats to or attacks on Allies' space systems, as appropriate and in line with the principles and tenets outlined in this policy;
- b. The Alliance should develop a common understanding of concepts such as the role of space in crisis or conflict;
 - c. As part of the effort to increase the readiness and ability of the Alliance to operate decisively across all operational domains (land, maritime, air and cyber), due consideration will need to be given to the role of space as a key enabler for operational domains, as well as for NATO Integrated Air and Missile Defence, and, for Allies concerned, nuclear deterrence;
 - d. While resilience and survivability of Allies' space systems is a national responsibility, NATO will consider ways to improve space resilience Alliance-wide, including through sharing of best practices, and by exploiting force-multiplying redundancies in space capabilities owned by Allies;
 - e. Guidelines will need to be developed on how to secure and ensure NATO's access to space data, products, services and capabilities.
2. At the 2021 Brussels Summit, Allies agreed that attacks to, from, or within space present a clear challenge to the security of the Alliance, the impact of which could threaten national and Euro-Atlantic prosperity, security, and stability, and could be as harmful to modern societies as a conventional attack. Such attacks could lead to the invocation of Article 5. A decision as to when such attacks would lead to the invocation of Article 5 would be taken by the North Atlantic Council on a case-by-case basis.⁸
3. Capability development and interoperability. NATO will pursue a number of work strands related to capability development and interoperability, pertaining to space:
- a. Allies have previously agreed on the need to be cognisant of the enabling role of space capabilities and the growing importance of space for NATO operations, missions and other activities, while at the same time recognising that Allies retain full authority and sovereignty over their space capabilities and resources;
 - b. NATO will encourage cooperation between Allies to enhance the compatibility and interoperability of their space capabilities, including through information sharing (e.g. Space Situational Awareness) and coordination, joint development and production, standardization and related doctrinal, legal and procedural work;
 - c. The space domain should be appropriately reflected in the context of the relevant NATO capability development programmes.
4. Training and exercises. NATO also has an important role to play in the area of Education, Training, Exercises and Evaluation with a view to advancing Alliance-wide understanding of the space domain, taking into account the extensive network of NATO's educational and training facilities, multinational education and training institutions, entities and programmes. Space should continue to feature more consistently and prominently in NATO exercises, to include partial or complete loss of access to space services provided by Allies' capabilities. NATO forces should be prepared to operate when space support in operations is degraded, denied

or disrupted.

5. Strategic Communications and responsible space behaviours. NATO will continue to communicate on NATO's approach to space based on concrete decisions and developments. NATO and Allies support international efforts to develop norms, rules and principles of responsible space behaviours.
6. Science, technology and innovation. NATO will consider ways to better exploit scientific, research and technological capacity that exists across the Alliance (e.g. the NATO Communication and Information Agency, the Science and Technology Organisation, relevant NATO educational and training facilities and NATO-accredited Centres of Excellence), as well as the work in innovation and experimentation which is being led by Allied Command Transformation, with a view to contributing to space awareness and effective application of space capabilities and services to meet the Alliance's political and military objectives.
7. Industry. Allies should also explore opportunities to foster cooperation with space-related industry and the commercial sector through readily available frameworks (e.g. the NATO Industrial Advisory Group and the NATO-Industry Forum).
8. Partnerships. NATO will engage with selected partners and relevant international organisations, such as the UN and the EU, on space and space-related aspects, as appropriate, and where it adds value to NATO's core tasks.

NATO SPACE TERMINOLOGY

In the context of NATO's overarching space policy, the following terminology is used:

Space. Space is the 'volume' beyond the upper limits of airspace⁹.

Space system. A space system can include: (1) the space segment (all elements in orbit); 2) the ground segment (ground station and command and control centre); 3) the data links (uplink, downlink and cross-link); and 4) the user segment (decision-makers and deployed forces).

Space capability. The capability using space systems, which supports, among others, military commanders, staffs and forces in all operational domains.

Space services. The services provided by space systems to users in order to enable them to conduct operations (e.g. SATCOM and PNT).

Space data. The information acquired, produced and provided by space systems or relayed to or through space systems necessary for the provision of space-based products and services.

Space products. Space products are synthesised and processed data used for operations (e.g., satellite images, weather forecasts and satellite reconnaissance advanced notice).

Space support. Space support is the ability to support operations through the provision of data, products and services, provided or procured by space-capable nations, governmental and commercial organisations.

Space domain awareness. Shared understanding of the operational space-related environment, threats and vulnerabilities that encompasses the functional areas: Space Situational Awareness (SSA), Intelligence Surveillance and Reconnaissance (ISR), Positioning, Navigation and Timing (PNT), Satellite Communications (SATCOM), Meteorological Services (METOC), Shared Early Warning (SEW), with regard to the implications for NATO's ability to conduct operations, missions and activities in other domains.

1. For the purposes of this policy, the term 'space domain' is used in a generic manner to denominate the totality of all space and space-related activities that are relevant in terms of security and defence.
2. While China and Russia both have advanced programmes, Iran and North Korea and some other nations also have some indigenous counter-space capabilities.
3. As per the Outer Space Treaty.
4. As per the Outer Space Treaty.
5. As per Article VIII of the Outer Space Treaty.
6. Owning devices or parts of ground segments enables the Alliance to benefit from Allies' space capabilities.
7. The NATO Space Centre is the hub of operational space information and expertise in Allied Command Operations, and is responsible for ensuring coordination and interoperability of space-related activities across all domains by liaising with national space entities and relevant NATO stakeholders.
8. 2021 Brussels Summit Communiqué, paragraph 33.
9. Recognising that currently there is no universally agreed definition of space.