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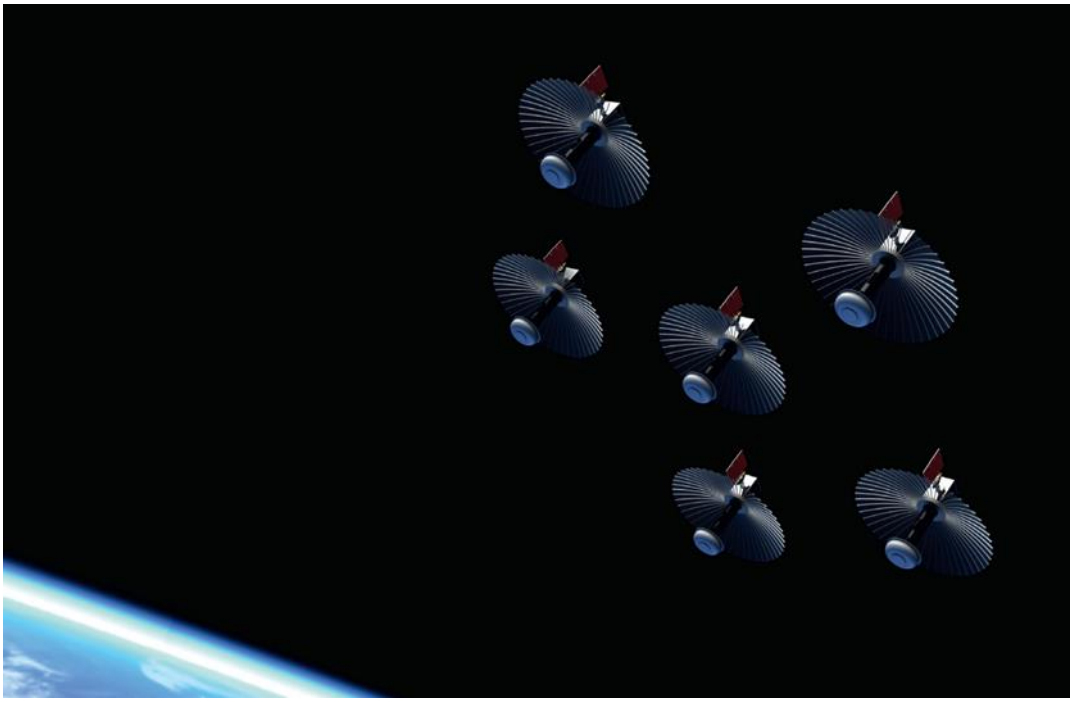

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Report

Responsible space behaviours – Latin American perspectives

Tuesday 10 – Thursday 12 January 2023 | WP3093

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In association with the Foreign, Commonwealth and Development Office

Introduction

In January Wilton Park held a regionally focused in-person event in Panama City. The event helped participants prepare for the January UN Open-ended Working Group (OEWG) on Responsible space behaviours. Representatives from eleven nations[1] in the region participated, as well as other nations, members of academia, NGOs and United Nations organisations, and industry. Participants discussed strategic competition and space threats, monitoring space activity, current laws and frameworks, industry perspectives, and how norms, rules and principles of responsible behaviours might help address threats to space systems.

The journey to and an update from the OEWG

The Outer Space Treaty (OST) was agreed for the interests and benefits all nations and for 55 years it has been a cornerstone for maintaining space as the province of all humankind. The OST sets out the rights and obligations of States, including a prohibition on the placement of nuclear weapons in space and a requirement to act with due-regard to the interests of other states.. However the situation in space has changed considerably since 1967. Space weapons have been tested, such as direct-ascent anti-satellite (ASAT) missiles, with significant consequences such as the generation of large amounts of orbital debris. Space activity has proliferated, and technology has evolved. We are impatient to exploit the benefits of space, especially the economic benefits but space is increasingly important for defence and security. The securitisation of space has led to increasing mistrust and concern and occasional interference with space systems. Given the less visible nature of space, threat perception is as important as genuine threat. Norms of responsible behaviours are important for building greater trust, be they agreed or codified in the form of soft laws or legally binding arrangements.

The OEWG's mandate is to submit recommendations on norms, rules and principles of responsible behaviours. The first two meetings of the OEWG focused on existing legal and normative frameworks and threats. The January OEWG will focus on norms before reporting to the UNGA in the Autumn. Participation at the OEWG is a collective effort; inclusivity will support achieving a breakthrough in an area that has previously been at stalemate. Furthermore, full participation of states will add an additional layer of legitimacy to previously polarised discussions. All countries increasingly depend on and benefit from the peaceful use of space. Agreeing responsible space behaviours is increasingly urgent. If threats aren't addressed in a timely manner, we cannot evaluate the consequences. And it is possible that conflict on earth could spread to space and vice-versa. The topic of responsible space behaviours is universal whether a nation is

[1] Argentina, Bolivia, Brazil, Chile, Colombia, Costa Rica, Jamaica, Mexico, Panama, Paraguay, Peru, El Salvador

spacefaring or not - indeed some participants deemed this distinction as increasingly irrelevant and unhelpful. All nations are connected through space and share dependencies and responsibilities for their and all nations' well-being and development. It is not necessary for all nations to adopt a position, but all nations should engage; as proven by the resolutions on responsible space behaviours, wide participation can achieve breakthroughs and add legitimacy. A minority of delegations are not convinced of the value of this approach, but Resolution 76/231 was adopted by an overwhelming majority giving the OEWG its mandate, and the underlying approach is the one that focuses on responsible behaviours. Despite these tensions, pragmatism and positivity have so far prevailed in the OEWG, including from Latin American and the Caribbean participants. It is in everyone's best interest to reach a solution.

Strategic competition in space

There is not a universally accepted definition for strategic competition. However, broadly it involves the attempt to gain advantage often relative to others believed to pose a challenge or threat through the self-interested pursuit of contested goods such as power, security, wealth, influence and status.

Strategic competition is a spectrum across which all levers of government are used and is not limited to the military. As space grows in importance to the military as a strategic and operational domain, and space systems are integrated with military systems, strategic competition in space is accelerating. Not only are we seeing counter space capabilities but also potentially counter-counter space capabilities. Due to the nature of space and space systems technology (e.g. dual use, complex, hard to monitor), misunderstandings and misperceptions are real risks and could lead to unmanaged escalation; when considering action in response to a threat there is a risk of escalating from reversible action to irreversible action. Moreover, increasingly offensive postures could create security dilemmas and we need to consider levers available to de-escalate offensive postures, perceived or real. The effects of actions in space can be direct and, as many beyond the military depend on space-based services. Participants were reminded of the principle of proportionality under international Humanitarian Law. It is also worth considering that we cannot limit nations' abilities to defend themselves although destructive DA ASAT testing is by most considered unacceptable.

Dual-use and dual-purpose were discussed as terms. A dual-use satellite may be used by both military and civilian users but might not necessarily be used aggressively such as a communications satellite. A dual-purpose satellite might not be designed for but could be repurposed for an aggressive military function, such as an active debris removal or on orbit servicing satellite. However the distinction is blurred, as a communication satellite (with sufficient manoeuvrability) could be deliberately crashed into another satellite.

Participants discussed how to govern dual-use and dual-purpose systems Russia, for example, has criticised the use of commercially available imagery being used in support of Ukraine. What are governments' responsibilities supporting companies providing the imagery and enabling the Ukrainians to use it? Participants considered parallels between arms exports controls and nations' responsibilities for use of capabilities in space. Could export sales restrictions and legal limitations inform rules governing the use of space systems, recognising digital capabilities are harder to track? Any controls over imagery must be sufficiently agile to avoid impeding valuable uses such emergency services dependant on imagery.

The nature of threats to space systems

Discussions focused on the range and nature of threat capabilities, the nations that possess them and how miscalculation and misunderstanding, such as through dual-purpose satellites, can create tension and trigger conflict. As starting point it was

suggested the aim of mitigating threats to space systems is to create a predictable and dependable space environment for all.

Currently only non-destructive capabilities are being used in current military operations. However, we are seeing significant research, development and testing of a wide range of destructive and non-destructive counter space capabilities by a number of nations. Space situational awareness is a valuable counter space capability but does not mean, on its own, that a nation has a counter space programme. DA ASAT tests were again mentioned for their debris creation hazard and potential impact on satellites and space-based systems. ASAT tests potentially impact on astronauts; the ISS recently had to take emergency action when it risked a collision with debris. Participants discussed the 2008 US ASAT test which was described as intending to destroy a toxic satellite returning to earth. This highlighted the difficulty of confirming intent. Some participants volunteered that some behaviours are simply unacceptable for example, further Direct Assent Anti Satellite Missile tests, for the risks it creates in further debris in an already congested space orbit.

Further examples of the potential for misunderstanding and tensions were illustrated of satellites releasing sub-satellites and of active debris removal. Chinese satellite SJ-21 was launched in 2021 as a space debris mitigation satellite. Three months after launch it rendezvoused with another, defunct satellite from the same nation and physically pushed it to graveyard orbit. While there are concerns whether active debris removal is a long term solution to space debris, the issue in this case is intent was not given before or during or after the operation. Greater transparency would be welcome.

The examples illustrate that interactions between satellites belonging to different nations are happening in space, emphasising the risk of misinterpretation and escalation, and the importance of establishing how to clarify intent. It was suggested that mechanisms for transparency are missing, and transparency needs to be defined. Transparency does not have a specific universal meaning nor is it an attractive term for all. However as examples, pre-launch notification was seen as simple but potentially invaluable as was establishing hot lines to be able to query behaviours when occurring.

Examples of jamming and spoofing were also described, focusing on Russian jamming and spoofing prior to the invasion of Ukraine, which affected commercial operations. Also GPS spoofing in Europe with disruption of navigation services for commercial aircraft in Finland. While there was no harm done to the aircraft, air traffic volumes and services were affected. Similar effects on the internet and renewable energy sources were also described. While describing the detrimental effects of jamming and spoofing, it was recognised that these are non-kinetic, temporary effects and many governments might wish to conduct jamming and spoofing operations. This raised the issue of how activities should be conducted responsibly. Discussion returned to whether we are missing mechanisms and have previously ignored the practical challenges of governance because of the limited amount of activity conducted by only a few nations. With greater understanding of the international dependency on space-based services, more nations are raising this issue and suggesting a need for greater transparency.

Monitoring space activity and threats to space systems

Space Situational Awareness (SSA) can also be used as a tool for monitoring and verification. It is not the only solution and can be used in combination with other mechanisms, including to build trust. Participants commented on the need for greater regulation of space companies with a need for a framework with the commercial sector to increase communication and understanding of how satellites are being used. While policy makers may draw up these regulations, commercial companies provide the majority of SSA data and tracking. A critical goal was seen as providing SSA that could be trusted by many countries, so the question posed was what can we do to manufacture that situation?

A main commercial goal of space operations was described as increasing the lifecycle of a satellite – which is driving innovations in in-orbit servicing, and reducing manoeuvres to conserve fuel. Space traffic co-ordination including conjunction assessment help reduce the need for manoeuvres and avoiding collisions in space. And commercial space operators play a significant role in space security, they can provide information on other states' space activity and track hostile threats. Commercial operators are very aware of the challenges of this role and having conversations within governments about their approaches to and values of space security. It was noted that nations do not all have sensors and rely on commercial operators or (free from) the US for space information. Further discussions concerned the obligations of states when hosting third party space systems, including commercial satellites, raising the question of how far a nation is legally or morally responsible for hosting a third party state's space activity.

Threats to commercial operations include jamming, cyber, gateway attacks, space based-kinetic/co-orbital. There has been an increase in these kinds of threats, partly because there is a low risk of being identified as the perpetrator. . The main take away from the cyber-attack on VIASAT in Feb 2022 - which remains unattributed by the company while its investigation is ongoing – is the lines are blurred between government and commercial capabilities and assets. The use of commercial systems by defence and government is growing and implies a need for policy protections, transparency in contracts, and trust in governments and military to provide that. Dual-use systems may still be legitimate military targets in the context of an armed conflict subject to considerations of the humanitarian impact. The internationality of issues of space security suggest policy protections should be international. Policy also needs to make room for new entrants, as the trajectory of activity in space will continue. Norms and behaviours need to manage this trajectory and promote economic and scientific growth while preserving the long-term sustainability of the space as an ecosystem of commercial, scientific and military capabilities.

Current frameworks and law applied to space threats.

The 1967 Outer Space Treaty remains a corner stone of the constitution of outer space, although the context has advanced rapidly since the treaty has come in force. The treaty was described as a 'light' treaty, but with a number of useful tools which are under-used. Politics have changed since 1967 when there were a few powerful states behind the treaty. Participants suggested that there was an opportunity for greater use of the space treaty as an existing mechanism in multilateral processes. Measures to address advances in space technology, commercialisation and changing geopolitics, could be done through additional voluntary protocols, but participants described their desire for a legal framework to govern second and third parties which they depend on as a non-spacefaring nation.

Looking beyond the law to institutions could be helpful, with a secretariat to interpret principles. However, there is currently no single body within the United Nations to govern space security. Instead there are different layers and actors and a lack of dialogue in some areas, which can create fragmentation and gaps. The separation between discussions in the 1st and 4th Committees was considered problematic and it was suggested that creating a single forum might be helpful, and avoid a debate about where space issues should be discussed. Space has been used for both civilian and military purposes since the start of space exploration. There was a broad consensus from participants that International Humanitarian Law (IHL) principles should and could be applied to the discussion of norms at OEWG. It was suggested that IHL would apply whether on earth or space; any offensive action should be proportional, and both direct and indirect affect analysed. IHL would always be applied if miscalculations did reach a conflict in out of space, however this is a view not shared by all states at the OEWG, and new norms and principles must be consistent with and strengthen existing frameworks including IHL.

The Latin American and Caribbean community is growing in importance with technical capacity and new space actors. Some nations are producing space technology across the public, academic and private sectors and being increasingly active in space operations. The region also has a broadly common socio-economic sense of the peaceful use of outer space. However, space capabilities in the region are asymmetric and mandates for space activities differ from country to country with few countries having space agencies. The importance of regional engagement was emphasised, without which others will decide and regulate.

Industry perspectives on safe and secure space operations

Commercial operators want space to be predictable, stable and safe. Industry shares concerns about increasing threats and sees strategic competition as a driver. Technology is also a driver and debris remains a big challenge. Due to the throw away culture in space, with a lack of governance surrounding end of life management, there are currently 10,000 tons of debris in orbit. If space is a global common, safe, secure operations should be seen in sustainability terms as an environmental issue. Satellites increasingly have sustainability built in before launch and commercial advances in active debris removal are essential for space sustainability. Many companies outside the US are watching the effect of the Federal Communications Commission (FCC) rules of September 2022 requiring satellite operators in low-Earth orbit to dispose of their satellites within 5 years of completing their missions.

Over the last two years the number of close approaches in LEO has increased 3 times from c. 2,000 per month to nearly 6,000. CONFERS, the industry forum for rendezvous operations, has suggested the following good transparency practices:

- All operations should be authorised.
- States should be notified.
- Collisions and near passes should be avoided.
- Third parties should also be notified.

Lessons can be learned where industry is setting the pace for suggested norms and behaviours, for example only authorised operations, avoidance of collision with other satellites and near misses and notification to third parties are a set of tangible of norms and behaviours applied in the commercial sector.

There is a necessity to work between commercial and governmental actors and across nations so that policy is not made in isolation but promotes economic and scientific growth in space while preserving long-term sustainability.. As we think about the work that reduces threats towards space systems, so we need to think about norms and behaviours without restricting and prohibiting beneficial and activities that could sustain

space. ADR is a case in point, where definitions are important. ADR could look like a weapon, it was suggested that from this case a definition of a weapon could be that it damages, destroys or disrupts a satellite system. However, any definition of a weapon could be interpreted to include ADR in its scope. Proposals therefore to ban weapons in space could inadvertently ban useful tech like ADR

The commercial sector has a fundamental role to play in space security. Both with technical advancement and with economic growth. The commercial sector in space is often advancing quicker than government capabilities and assets and will continue to have a rapid trajectory. The commercial sector is also affected by security issues in space. Anti-satellite weapons impact commercial opportunities in space and the 2021 Russian DA ASAT testing was widely condemned. It is in the commercial best interest to keep space predictable, safe and secure and to do otherwise would put at risk significant investment.

How might regulating behaviours help address threats to space systems?

Strategic competition is increasing incentives to develop capabilities to threaten other nations' space systems. Technology is increasing the interference and damage possible by counter space capabilities. Increasing dependence on and benefits from space are leading adversaries to increasingly consider targeting space-based capabilities. It was for these reasons the UK drafted the resolution which led to the setting up of the OEWG. The UK's aim is to reduce the risk of conflict and protect the space environment.

But defining conflict can be challenging. Differing perceptions of where thresholds lie mean States could miscalculate the response their activities might prompt from other States, with the risk of unmanaged escalation; tension can lead to crisis, and crisis to conflict. Norms of behaviour could reduce ambiguity, provide clarity and mutual understanding of what is and isn't acceptable. Environmental norms could reduce debris by limiting destructive testing and encouraging lifecycle extension or deorbiting after life. DA-ASATs are probably the most serious threat to space security, perhaps the most indiscriminate, unpredictable and potentially catastrophic. The joint Brazil and US resolution on calling on states to refrain from destructive DA-ASAT missile tests was welcomed.

Norms of behaviour are not the only tool nations think of or use to tackle counter space activities; they may consider developing their own capabilities intended to create mutual deterrence. So without norms and behaviours to govern space threats, the growing competition between space players continues, as does an increase in distrust and risk of miscalculation. Norms can increase deterrence, through adding geopolitical costs to actions we would like to prevent. Participants discussed how perceived intent is critical in this, our perspective frames the data, and this differs across different states, clarifying norms and behaviours is critical and public opinion on what activity in space is normal behaviour is important. Without an agreed understanding of norms and behaviours, understanding intent with space activity is difficult to define and the consequences to civilians could be catastrophic.

Inclusivity when discussing norms and behaviours is vital not just because all nations are affected but if powerful countries are locked in a mutual deterrence situation, they need other countries with alternative perspectives to offer different solutions. It was suggested that Russia-China draft treaty on the prevention of placement of weapons in outer space and the use or threat of force against space objects (PPWT) might complement responsible behaviours. But the challenge of dual use and dual-purpose systems remains, suggesting a behavioural approach characterizing behaviour in space rather than a capability-based one might be more appropriate. However describing norms was considered challenging when the intended use of a dual-purpose system can be unclear or can change.

Participants agreed the challenges of defining intention, and discrepancy in perceptions of threats. Good intent can be demonstrated through transparency, which was suggested as invaluable in addressing the effects of strategic competition. Transparency can range across budgeting and planning, liaison and participatory discussion, and in the process of identifying and agreeing responsible behaviours.

Breakout groups - Exploring threats to space systems and how they could link to conflict. What are the implications and what are the key features of effective norms, rules and principles for addressing space threats?

Within the breakout sessions, participants discussed jamming and spoofing, proximity operations and destructive testing in space, putting into practice the application of norms and behaviours in hypothetical situations. The benefit of different backgrounds and disciplines was noticeable to provide different perspectives and ideas for norms and behaviours. Although not fully in consensus on ideas for norms and behaviours, participants agreed they were more informed on emerging challenges in space agreement and had a rich discussion on possible norms rules and principles for addressing state threats to space environment and systems. Reflections included the divergence of views on what could be interpreted as a threat or hostile behaviour and the risk of mistaken attribution. Consensus was reached on the risk to military operations and civilian populations as well as of escalation and potential international conflict on earth or in space.

Jamming and spoofing. It is important to consider motivations. From the aggressor's point of view jamming and spoofing has the benefits of being accepted, reversible, non-kinetic and non-attributional. The effect on civilians might be desirable or undesirable from an aggressor's perspective but is difficult to determine. From the point of view of those affected, it is difficult to attribute and understand the intent; is this jamming a precursor to offensive action? This has significant potential to create escalation; an intent might be to provoke an escalatory reaction perhaps to kinetic action and affecting civilian services might build popular support for escalation. Jamming and spoofing can be offensive or defensive, norms would need to reflect this distinction. Potential norms or features of norms were suggested as:

- NOTAMS[2] as an example form of communication which could become a norm for responsible defensive jamming and spoofing.
- Also authorisation by conducting jamming and spoofing operations within existing legal frameworks and their principles including precaution, distinction and proportionality.
- Best practice and transparency by national legislation or declarations to deter the use jamming and spoofing.
- Limiting the area or extent of jamming, avoiding undue interference, taking precautions in the effect of the attack and the defence. Is it possible to conduct responsible jamming?
- Providing an acceptable degree of transparency around intent and impact.
- Minimising collateral impact.
- Avoiding impact on a third state.
- Due regard paid to the safety of civilians and minimising the effect on civilians.
- Protecting critical infrastructure.

Proximity operations. Proximity operations benefit the aggressor and pose risk to those affected and have significant potential for escalation. Indeed they may be a show of force but could also be a mistaken manoeuvre or poor operational discipline. It is paramount to understand the motivation for the operation, challenging to do so. Mistaken attribution can lead to escalation, it is important to consider why the operation has happened, what the operator has to gain, in the context of the relationship between the satellite operating nations / organisations. Potential norms or features of norms were suggested as:

- Increasing registration requirements.
- Increasing communication and co-ordination at both a technical and diplomatic level

[2] Notice to Airmen

- Increased transparency, publishing (more) information about locations and manoeuvres. A platform identifying locations, with information about manoeuvres, centrally held and international shared.
- There may be a standard of behaviour, which for some might be aspirational.
- It was suggested a centralised regulator might simplify information sharing and aid transparency, and they could facilitate space traffic management.
- Increased notification and a commitment to share an agreed level of information - not doing so would itself be an indicator - would support the regulator. It was noted that transparency is not only of what you are doing but also what has or is being done to you. Notification might include what is happening if it is within your state and notifying the operator of an affected satellite when that is not your satellite.
- Sensitive systems might be awarded a protected status.

Destructive testing.

- Nations might wish to conduct destructive testing for information on their own capabilities or those of others, to test other's reactions, to demonstrate capability in space, create an escalatory situation or to damage or destroy others' capabilities. Destructive testing presents significant risks. It risks deterring commercial and peaceful investment in space. It risks damaging others' and the own nation's space-based systems and poses a threat to life of astronauts. It risks competition and weaponisation of space leading to increased risk of conflict, including on earth; it is the potential nightmare scenario. Potential norms or features of norms were suggested as:
- Building an acceptable degree of transparency which builds trust, identifying the likelihood, intent and nature of destructive testing.
- Building consensus on the responsible use of space and space operations, making destructive testing be seen as irresponsible.
- Destructive testing in graveyard orbits, but due to the creation of debris this was seen as undesirable.
- A ban on destructive testing full stop.
- Adopting the LTS guidelines.
- Notification of launches, movements and planned tests. An operator to operator 'hotline.'
- Capacity building of space situational awareness through resources and information sharing, so more are aware of space activities and can call out testing.
- Insurance as a norm for operating in space.
- Financial or non-financial compensation for the effects of testing. However, some were not comfortable with the suggestions of compensation, emphasising instead national responsibilities

Katie Hannam, Head of Foreign Policy, British Embassy, Mexico
Wilton Park | January 2023

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Annex A to Wilton Park WP3093 Responsible space behaviours – Latin American perspectives

To note the ideas listed were not in consensus by all participants and some may fall out of the mandate of the OEWG.

Suggested norms or features of norms.

Transparency

- Transparency was agreed to be most important, recognising transparency is subjective and contextual. Most pragmatically, transparency could be seen as on a scale. A norm should be striving for greatest practical transparency.

Communication

- Communication specifically aimed at trust building: communicating through predictable and repetitive manoeuvres or other actions, to establish and strengthen accepted operating norms.
- Communicating in exception, before exceptional or novel manoeuvres or other actions.
- A mechanism for identifying the chain of command for actions.

Authorisation

- Operations should be authorised by applying existing international law including IHL and the principles of proportionality, precaution and distinction.

Notification

- Notifying, launch, intent and manoeuvre or other actions to relevant national or international authorities, providers or commercial actors e.g. airlines operating in an area, including through NOTAMs.
- Notifying multilaterally if threats to space activity have taken place.
- Notification multilaterally if a national or commercial operator has lost control of a satellite or is experiencing anomalies.

Destructive testing

- Limiting or ceasing destructive testing.

Jamming and spoofing

- Limiting the collateral effects of jamming and spoofing.

Existing governance

- Participants agreed that International Humanitarian Law should apply in developing norms and behaviours, while acknowledging there is current divergence between states' interpretation of the application of IHL.

Verification

- Linked to communication and notification, making manoeuvres and actions as predictable as practical and notifying intent or an event to aid verification.

Threats

- Accepting the military uses of space-based systems, agreeing an acceptable level of threat and boundaries for harmful interference, paying due regard to the safety of civilians and taking precautions in attack and in defence.
- Avoiding interference with and damage to systems agreed as having protected status and to other critical infrastructure.
- Avoiding affecting a third state in and beyond conflict.
- Avoiding interference with signals between satellites and their ground control stations, to reduce the chances of unintended and potentially dangerous manoeuvres.

Other discussion points

- A centralised regulator
- Global shared SSA
- Capacity building for shared SSA through resources as well as information sharing.