DETERRENCE IN OUTER SPACE: THE US WAY

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Strategic stability between the US and USSR during the Cold War was anchored in deterrence based on mutual vulnerability or Mutual Assured Destruction (MAD). It is assumed that in outer space too, deterrence based on reciprocal ability to cause destruction would apply amongst the major space-farers to keep acts of extreme disruption at bay. So, as the stakes of nations and private players would grow, so would the vulnerabilities of each, individually and collectively. This then, it is expected, would prevent any one player from taking steps that could be destabilising for all others as well as for self.

While this appears pragmatic in theory, it is equally true that the vulnerabilities of different space players are currently poised at different levels. At this juncture, the US has the maximum dependence on space for civilian and military activities. More than 60 percent of all global civil space expenditure and 80 percent of the world's military activity is undertaken by the USA. Close to half of all satellites in orbit – 528 out of 1,265 – are American.[1] It is small wonder then that Bob Work, US deputy secretary of defence, while addressing the American space community at a conference in April 2015 said, "Space is deeply enmeshed in our force structure and is central to our way of deterring, assuring and war-fighting".[2] Obviously,

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1. Guilhelm Ponent, *Space in a Changing Environment: A European Point of View* (Paris: IFRI, April 2015), p. 4.
2. Jim Garamone, "Work: Space Domain Presents Challenges, Threats", US Department of Defence Press Release, April 16, 2015.

As existing space-faring nations become more deeply invested in space, and as more players – state and private – join hands in this endeavour, common sense tells us that the risk of warfare in space should recede for the mere fact that it would affect far too many players and not allow for selective targeting.

the USA also has the maximum to lose in the case of any disruption of the space environment. As graphically stated by the US Deputy Assistant Secretary of Defence for Space Policy, Douglas Loverro, "US space capabilities allow our military to see with clarity, communicate with certainty, navigate with accuracy, and operate with assurance"[3]. While this translates into a huge advantage, it also spells a vulnerability that the US is, of course, well aware of, and working towards redressing. Russia and Europe too are dependent on space. But less than the USA. And, countries like China and India are yet to become overly dependent on the medium, hence, their vulnerabilities are also comparatively lower compared to others, though certainly higher than what they may have been a decade ago. As existing space-faring nations become more deeply invested in space, and as more players – state and private – join hands in this endeavour, common sense tells us that the risk of warfare in space should recede for the mere fact that it would affect far too many players and not allow for selective targeting.

However, national ambitions that are aimed at wresting space control and denying freedom of access in outer space to others lead to responses of hedging that can easily cause mistrust and misjudgment of each other's actions and intentions. So, as each tries to safeguard his freedom of action, the result may eventually be a tendency to step on the other's toes triggering off an unwanted and inadvertent escalation. The offence-defence spiral that has played out on Earth so many times and in the case of so many weapon systems, can very well repeat itself in outer space too. As Kenneth Waltz had rather presciently stated, "As ever, dominance coupled with immoderate behaviour by one country causes others to look for ways to protect their

3. Statement of Douglas Loverro, deputy assistant secretary of defence for space policy, before the Senate Committee on Armed Services, April 24, 2013.

interests".[4] Nothing indicates that outer space would be immune from this tendency.

Since the USA is the current leader in this high ground and its actions have a widespread and profound impact on those of others, it would be instructive to examine the contemporary American thinking on how it believes it could/should exercise deterrence in outer space. This paper undertakes an examination of the US National Security Space Strategy declared in 2011. Based on this study, the paper will identify the current US approach to the concept of an International Code of Conduct (ICoC).

The US National Space Policy, 2006, adopted a belligerent and nationalist tone when it rejected "any limitations on the fundamental right of the US to operate in, and acquire data from, space". In doing so, it even emphasised that the US was prepared to take unilateral action to "dissuade, deter, defeat and, if necessary, deny, any space related activities that are hostile to its interests".

US NATIONAL SECURITY SPACE STRATEGY, 2011

Through the years of the presidency of George Bush Jr from the early 2000s, the US seemed to believe that it could individually dominate outer space owing to its superior investments in the domain through the Cold War period. Space dominance was indeed the flavour of all US space vision documents that were written during this phase. The US National Space Policy, 2006, adopted a belligerent and nationalist tone when it rejected "any limitations on the fundamental right of the US to operate in, and acquire data from, space". In doing so, it even emphasised that the US was prepared to take unilateral action to "dissuade, deter, defeat and, if necessary, deny, any space related activities that are hostile to its interests".[5] The policy clearly stated that "freedom of action in space is as important to the US as air power and sea power." This was interpreted by a British newspaper in these words, "Space is no longer the final frontier but the 51st state of the

4. Scott D Sagan and Kenneth N Waltz, *The Spread of Nuclear Weapons: A Debate Renewed* (New York: WW Norton, 2003), p. 149.
5. White House, National Science and Technology Council, "National Space Policy, 2006". Available at http://www.ostp.gov/

United States."[6] Consequently, the US openly opposed development of any new laws that could restrict or prohibit its access to, or use of, outer space.

This remained the tone of the US space policy until 2011, when the next iteration of the policy came along. The new version was formulated against the backdrop of two changed realities. The first, of course, was the change in the occupant of the White House. With a Democrat president, the general approach to space security was one that did not favour weaponisation of space and was more inclined towards multilateralism. The space policy accordingly came to be premised on a concept of "collective assurance".[7] This was to be created through interdependence based on international agreements and cooperative operational tactics and procedures. Throughout his two presidencies, Obama has emphasised multilateral diplomatic approaches to resolving contentious issues. It is interesting that the latest National Security Strategy that President Obama released in February 2015 also lays emphasis on a rules-based international order. This focus of his Administration has been reflected in the country's approach to space issues too.

The second change in the environment was brought about by the evident display of the space and counter-space capabilities of China. In fact, in the year 2010, China equalled the number of American launches at 15 satellites.[8] And, in 2011, it surpassed the USA by reaching the figure of 18 launches in one year. On the counter-space front, in January 2007, China had already conducted an Anti-Satellite Test (ASAT) which displayed the ability to hit another satellite with a kinetic kill vehicle. Later the same year, China launched its first lunar probe, the Chang'e, which brought back scientific data and a map of the Moon to successfully establish China's credentials in deep space exploration. In 2008, with the successful launch of the Shenzhou 7, which took three men on a three-day mission to outer space, China became the third country to have an astronaut perform a space walk. In 2010, China demonstrated a successful Ballistic Missile Defence (BMD) intercept and also launched a second lunar probe, the Chang'e 2. In September 2011,

6. Bronwen Maddox, "America Wants it All – Life, the Universe, and Everything", *The Times,* October 19, 2006.
7. Christopher Stone, "Re-thinking the National Security Space Strategy: Chinese Vs American Perceptions of Space Deterrence", *The Space Review,* November 4, 2013, http://www.thespacereview.com/article/2395/1
8. Jeff Foust, "Space Challenges for 2011", *Space Review*, January 3, 2011.

China placed the Tiangong 1[9], an experimental space lab into orbit. Two successful dockings with this spacecraft have since been conducted. The first of these was of the Shenzhou 8, an unmanned capsule in November the same year itself. But in June 2012, taking a step further in its human space flight and orbital space station programme, China launched the Shenzhou 9, carrying three astronauts (one of them being a woman) to dock with the orbiting lab. The crew successfully returned to Earth on June 29 after spending three days in space. With this feat, China was able to demonstrate its ability to manoeuvre a space capsule to rendezvous with, and attach itself to, a port on the station in order to transfer people and material to sustain a space station. Three more Shenzhou missions are expected to further the ability of the country to manoeuvre in space and sustain long-duration life support systems, thereby laying the foundation for a future space station, which is scheduled to become operational by 2020. Meanwhile, in May 2013, China conducted another test which it qualified as a "high altitude scientific research mission" designed to "investigate energetic particles and magnetic fields in the ionized stratum and near-Earth space"[10], but which the US has termed as another ASAT. The launch of the rocket Dong-Ning 2, from the Xichang Satellite Launch Centre was described as a ground-based, high Earth orbit attack missile.

Interestingly, officially, the US has expressed little concern on these developments. But, testifying at a hearing before the House Armed Services Committee in January 2014, Ashley Tellis described the threat posed by China's current and evolving counter-space capabilities to US space operations as "extremely serious" and "particularly problematic".[11] He recounted the relevant Chinese capabilities as ranging from direct ascent and co-orbital ASAT programmes, to electro-magnetic warfare, to directed energy and radio frequency weapons to cyber attack. Indeed, China considers American dependence on space as the US military's soft ribs and strategic weakness. Faced by this kind of reality, the current tranche of

9. The Tiangong 1 weighs less than 10 metric tonnes compared to the International Space Station's 400 metric tonnes.
10. Zachary Keck, "China Secretly Tested an Anti-Satellite Missile", *The Diplomat*, March 19, 2014.
11. Ashley Tellis at the hearing before the House Armed Services Committee, available at http://www.spaceonline.com/news/hasc-told-chinas-counterspace-capabiliites-extremely-serious?utm. Accessed on January 31, 2014.

The ideas being considered in this category include use of higher orbits, larger number of spacecraft, distribution of mission systems over-linked satellites, and on-orbit spares as well as satellite sensor shielding and collision avoidance manoeuvres.

US space policies is now planned along four main vectors to address the perceived threats from China's capabilities. As Adm Haley, commander of the US Strategic Command (STRATCOM) said in 2014, "Deterrence is more than just the triad. We are highly dependent on space capabilities, more so than ever before. Space is fully integrated in our joint military operations as well as in our commercial and civil infrastructure. But, space today is contested, congested and competitive."[12] The four trajectories along which the US is developing its space deterrence are briefly elaborated in the following paragraphs.

Increasing Resilience of Own Space Assets

One approach that the US has taken to protect its space assets is to enhance technological measures that can protect its satellites from willful disruption by an adversary. The ideas being considered in this category include use of higher orbits, larger number of spacecraft, distribution of mission systems over-linked satellites, and on-orbit spares as well as satellite sensor shielding and collision avoidance manoeuvres. In order to minimise the chances of loss of mission critical capability to a single point failure, there is a move towards building passive resilience. The new satellite technology is being designed for shorter lives of no more than a decade compared to the 30 years of earlier satellites. It is believed that this would also revive a sagging US space industry[13], which really is the backbone of future launches. Much literature from US space agencies and think-tanks has been published over the last decade or so lamenting the incoherence in the US space strategy as pertaining to incentivising the space industry with a certain guarantee of launches and

12. Joshua Alvarez, "STRATCOM Commander: Deterrence Remains Foundation of National Security", Centre for International Security and Cooperation, News Release, December 10, 2014, available at http://www.cisac.fsi.stanford.edu.
13. The US share of global satellite manufacturing and launch revenues is stated to have decreased from 60 percent in 1997 to 40 percent by 2006 owing to the difficult and restrictive export control regulations of the Administration. For more, see Futron Corporation, "State of the Satellite Industry", Report, June 2007, pp. 15-16.

satellites. In 2011, the US Air Force (USAF) had proposed a solution in the form of EASE or Evolutionary Acquisition for Space Efficiency which envisaged measures such as block buys for the Evolved Expendable Launch Vehicle (EELV) instead of small inefficient purchases that did not allow contractors to plan ahead and make use of economies of scale, "fixed price contracts on mature systems and a stable engineering line for technology insertion"[14]. Technological solutions of the kind being considered for enhancing resilience are believed to be able to address the existing challenges in the internal and external dimensions.

More and smaller satellites would, therefore, form a network that could compensate for the loss of one. This would also make it easier to replace the degraded satellite quickly.

Dissuasion Through Disaggregation

Yet another response being crafted by the US to deal with perceived threats is that of disaggregation of the space architecture. This pertains to the "dispersion of space-based missions, functions or sensors across multiple systems spanning one or more orbital plane, platform, host or domain."[15] Such a system is geared to avoid threats, ensure survivability, and build the capacity to reconstitute, recover or operate even through adverse events.

It seeks to convey the message to the adversary that his attempts at degrading US space capabilities would not be able to meet the objective since the numbers and missions of satellites would be so disaggregated as to deny victory. Therefore, this is essentially deterrence by denial and envisages distribution of a mission over a number of smaller spacecraft, instead of the traditional approach of having large satellites, with each one carrying multiple payloads. More and smaller satellites would, therefore, form a network that could compensate for the loss of one. This would also make it easier to replace the degraded satellite quickly. The idea of fractionalised space or Programme F6 was actually first explored by the US Defence Advanced Research Projects Agency (DARPA) in 2006 as an alternative to the existing US format in space that was based on creating single, stand-

14. Robert S Dudney, "Five Roads to Space Dominance", *Air Force Journal*, July 2011, pp 25-28.
15. USAF Space Command, *Resiliency and Disaggregated Space Architectures*, White Paper 2014.

alone satellites tasked with one specific mission. As an alternative, it was proposed that each sub-system of a satellite would be a micro-satellite, many of which could then be networked.[16] This would provide immunity against the failure of one sub-system affecting the entire mission. It would also allow modules to be standardised and produced in large numbers for all kinds of networked clusters, thereby providing economies of scale in production. Such clusters would enhance survivability as also make replacement easier without having to undertake the launch of a big satellite. However, the issue of cost trade-offs, in this case particularly, the necessary spending on communications between and amongst the networked satellites, which would be more vulnerable to jamming than a bigger satellite's internal sub-systems, is still an unaddressed issue. Meanwhile, if others follow this trend, the Low Earth Orbit (LEO) will certainly get even more crowded. Meanwhile, it should not be forgotten that the US already has alternate systems that provide it with operational security. For example, the US possesses a number of airborne platforms that can duplicate and outperform many missions performed by satellites. The U-2, Joint Surveillance and Target Attack Radar System (JSTARS), E-2C Hawkeye and Unmanned Aerial Vehicles (UAVs) of many types perform Intelligence, Surveillance, Reconnaissance (ISR) functions. In fact, it is notable that even in the case of the Iraq War of 2003, which is widely considered to be a space-enabled war, the US Air Force "employed 80 aircraft that flew nearly 1,000 ISR sorties… collecting 42,000 battlefield images… 2,400 hours of SIGINT coverage and 1,700 hrs of moving target indicator data".[17]

Deterrence Through Threat of Retaliation

As part of its larger deterrent strategy, response in self-defence to attacks on space assets remains a major plank of the US space strategy. This includes not necessarily responding in space since such retaliation would jeopardise the attacker and perhaps his allies too. There are many ways to damage or disable satellites without physically killing them. Meanwhile, attacks on the supporting infrastructure on Earth, as well as disabling satellites through the

16. For more on this, see "US: Satellites and Fractionalized Space", *STRATFOR Analysis*, May 6, 2008.
17. Jaganath Sankaran, "China's Deceptively Weak ASAT Capability", *The Diplomat*, November 13, 2014.

use of jammers, lasers, cyber attacks, etc is always an option. As warned by Dudney, "Any serious attack on US space-based systems could well attract a harsh US reponse by air, sea, or land, and at any point on the globe. Indeed, this kind of threat appears more credible than the one narrowly focused on space".[18] With many soft kill capabilities now available, hard kill or ASAT is even considered a case of overkill for the collateral damage it is likely to cause. It is not surprising, therefore, that nations are not known, at least publicly, to maintain an arsenal of weapons meant to carry out attacks on assets in space.

As Michael Krepon, a noted space strategist and co-founder of the Stimson Centre said in his testimony before the House Armed Services Committee on January 28, 2014, "When so much latent capability exists to mess with satellites and infrastructure, dedicated capabilities can be unnecessarily costly and redundant."[19] But, as he points out, being able to use these requires better space situational awareness, improved command and control and intelligence capabilities. The build-up of these capabilities would enable deterrence of an attack or even attribution of responsibility, thereby threatening retribution.

Interestingly, another strategy of propping up deterrence that the US has adopted is that of getting its armed forces and government agencies to hold a "day without space" exercises. The idea behind such simulation exercises is to indicate the readiness of the US to absorb an attack on its space systems and yet be ready to fight and prevail in combat even when outer space benefits are not available. This approach also includes enhancing the number and capabilities of reconnaissance aircraft, UAVs or other terrestrial communication platforms that can substitute for space-based systems. The objective of such an exercise is to disabuse the adversary of the idea that his attacks on US space assets would be able to disorient or disarm the US enough to deprive it of the capability of retribution.

Diplomatic Overtures

In its efforts at diplomatic engagements to address the concerns of space security, the US appears to be moving along two lines: collaboration with allies to shore up space and counter-space deterrent capability; and guarded

18. Dudney, n. 14.
19. Testimony as reproduced on the Stimson Centre website. Accessed on January 31, 2014.

support for rules-based space governance. The first approach comes from suggestions made by strategists such as Ashley Tellis that the US should engage with allies such as Japan, South Korea, India and Australia on "challenges posed by China's counter-space programme".[20] This approach recommends reaching out to allies to leverage their space capabilities in a complementary manner. Besides other nations, the US is also willing to engage with international organisations, and commercial firms. As a step in this direction, for example, the US STRATCOM has changed the USAF led Joint Space Operations Centre at Vandenberg, California, to a combined space operations centre featuring foreign partners. The US has today 50 Space Situational Awareness (SSA) agreements with nations, international organisations and commercial entities. Some of these include countries such as Australia with which the US jointly operates a C-band ground-based radar system from the southern hemisphere as also a space surveillance telescope placed in both Australia and Canada which, through its Sapphire sensor, feeds into US SSA data, and France, which too was amongst the first to join the US space situational awareness network. This has come to be known as the Combined Space Operations (CSpO) concept, essentially a "multinational effort focused on cooperation, collaboration, and the integration of military space activities to strengthen deterrence, improve mission assurance and enhance resilience while optimizing resources across the participating countries"[21].

Such a collaborative network performs two important functions. Firstly, it has already proved its mettle in providing forewarnings on possible collisions. According to USAF Lt Gen Raymond, in 2014, spacecraft operators across the world carried out 121 manoeuvres to avoid collisions with debris. Nearly 30 collision alerts are believed to be received by STRATCOM every single day.[22] The second idea behind this network is to leverage the capabilities of others which are fast growing, to add diversity and resilience to the American architecture. This would deny an aggressor the opportunity to take up a fight on a one to one basis since, given the networking of

20. Tellis, n.11.
21. Loverro, n.3
22. Beth Duff-Brown, "The Final Frontier has Become Congested and Contested", *CISAC News*, Stanford University, March 4, 2015.

systems of many countries, it would end up attacking multiple countries, which would expand the scope of the conflict and reduce the odds of the attacker achieving the desired outcome at an acceptable cost.

Information sharing is obviously the key to the success of such a system. But it is equally seen as walking a tightrope on how much to share for international security and how much to hold back for national security. In fact, it may be recalled that way back in 1996, Joseph Nye and William Owens had recommended in an article that since the US had an advantage in information collection, processing and dissemination capabilities, it could dissuade others from building the same by using these "for political purposes that had broad international support." Their particular contention was that the US' willingness to share its situational awareness edge for mutual benefit "as a force multiplier for diplomatic responses to emerging security problems" instead of threatening others, would reduce their motivation to spend on building such capability, thereby degrading the US information advantage.[23] However, there were few takers for this idea of cooperative security at the time since the US was smug that it had preponderance in the domain after the collapse of the Soviet Union. China was yet to reveal its strength in outer space and was certainly not seen as a threat by the USA. Perhaps it was the American showcasing of its force capabilities from the space domain that led others to strive for the same. Today, the US Space Command feels threatened by this "competitive gold rush in space, depicting it as a lawless Wild West".[24]

The second approach taken by Washington is to support multilateral efforts aimed at formulation of rules of the road to promote responsible behaviour in outer space. Tellis, however, places little faith in these measures, particularly in their being able to help the USA meet the threat from China. As he stated in his testimony, "Even good confidence-building measures are unlikely to constrain China's evolving counter-space warfare programs in any meaningful way."[25] He opines that "the idea that Chinese counter-space

23. Joseph S Nye and William A Owens, "America's Information Edge", *Foreign Affairs*, March/ April 1996, pp. 20-36.
24. US Space Command, Vision for 2020, 1997 document, as cited in Nancy Gallagher and John Steinburner, *Reconsidering the Rules for Space Security* (Cambridge, MA: American Academy of Arts and Sciences, 2008), p. 24.
25. Ibid.

The idea that Chinese counter-space activities would diminish in intensity as Beijing slowly became a space power of significance has also proven to be illusory. Without a doubt, China is a major space-faring nation today.

activities would diminish in intensity as Beijing slowly became a space power of significance has also proven to be illusory. Without a doubt, China is a major space-faring nation today." This is certainly the case. China has a total of 105 satellites in space and annually launched more satellites than the US did for a period of 2-3 years. Yet, as Tellis states, "Beijing appears to have concluded that the 'delta' between its own and Washington's dependence on space for the fulfillment of their respective national aims favours China rather than the US." So, while any disruptive action in space would be harmful to China too, it would cause relatively more damage to the US owing to its greater dependence on space-based assets. Nevertheless, it is true that the current US Administration has lent support to the ICoC as a Confidence-Building Measure (CBM) of some value.

Spreading Vulnerabilities

Early in 2014, US Deputy Secretary of State William Burns, expressed a strong desire for encouraging increased collaboration in space. Speaking at the International Space Exploration Forum, he called upon countries to "make space exploration a shared global priority".[26] He identified three specific areas for this collaboration: more countries joining the International Space Station (ISS)[27]; encouragement to the commercial space sector to set up joint entrepreneurial ventures; and increased collaborative effort in defending the Earth from Near Earth Objects (NEOs) like asteroids[28] and comets and even space debris.

26. Marcia S Smith, "State Department Wants Space Exploration to be 'Shared Global Priority'", http://www.spacepolicyonline.com. Accessed on January 31, 2014.
27. The US Administration took a decision in January 2014 to keep the ISS operational at least until 2024 and not de-orbit it in 2020. The move was welcomed not only by NASA but also private companies like SpaceX and Orbital Sciences Corp that have been contracted to carry cargo to and from the ISS.
28. It may be mentioned that President Obama had launched an Asteroid Redirect Mission in 2013, but Congressional funding to NASA for the project was unclear at the time of writing this article.

Undertaking such projects would not only get the US to share the cost of such missions, but also get other countries to share the risks that might arise from any deliberate attempt by a nation to disrupt the environment. While China is working independently on having its own space station before the end of this decade, the entry of private enterprise in a big way for space tourism, cargo transportation to and from the space missions, or even for exploratory forays for minerals on asteroids would certainly raise the stakes, and indirectly promote pressures on nations to accept the rules of the road that promote safe and sustainable use of space as a priority.

The entry of private enterprise in a big way for space tourism, cargo transportation to and from the space missions, or even for exploratory forays for minerals on asteroids would certainly raise the stakes, and indirectly promote pressures on nations to accept the rules of the road that promote safe and sustainable use of space as a priority.

CURRENT US APPROACH TO INTERNATIONAL CODE OF CONDUCT

As is evident in the declared space doctrine of the USA, it is looking to secure its space assets by both building counter-space capabilities that include defensive measures that address the vulnerabilities of its spacecraft as also offensive capabilities that can deter/fight malafide attacks. But, at the same time, realising the limitations of these approaches, the US is also investing in diplomatic measures that create a regulated environment for the space activities of all.

The turnaround that came about in the US position towards the ICoC can be attributed to a realisation and acknowledgement of the vulnerabilities that space operations suffer from in the contemporary situation where "Nations – from Iran to Cuba, from Ethiopia to Libya – can, and often do, jam satellite links".[29] With a growth in space debris, kinetic ASAT capability as well as soft kill methods such as microwave, laser and cyber weapons, it is not surprising that the head of the USAF Space Command, William L Shelton described space as a "pretty tough neighbourhood".[30] For a country

29. Dudney, n. 14.
30. Ibid.

whose military power primarily depends on space-based surveillance, reconnaissance, navigation, communications and weather systems, this is not a surprising conclusion to reach.

It is in this context that the American space strategy of 2011 eschewed the earlier approach of space dominance in a unilateral fashion for acquiescence to the logic of participating in formulation and acceptance of some rules of the road. The current buzzwords through 2012 to now have been support for measures that help generate transparency and confidence-building in outer space operations and strategies. Deputy Assistant Secretary, Bureau of Arms Control, Verification and Compliance, Frank Rose, said on January 17, 2012, "The Obama Administration is committed to ensuring that an ICoC enhances national security and maintains the inherent right of individual and collective self-defence, a fundamental part of international law."

The US favours a system that encourages other space operators to share space flight data, develop databases and warn of space object collisions, and thereby create less debris. Such norms of good behaviour, it is now believed, would bring more stability into the environment by promoting less selfish behaviour since that would essentially be to the detriment of all. On the contrary, the rules of the road would allow for safe and secure use of outer space in a sustainable fashion, encourage less unintentional interference, promote more efficient use of crowded orbit slots, and cause less mistrust.

There is, of course, opposition to acceptance of the ICoC within the US. Republicans, for instance, are particularly of the view that such a code, despite not being legally binding and exempting legitimate cases of self-defence, would nevertheless make the US highly averse to continuing its ASAT programme. This would compromise protection for its space assets. It is for this reason that for decades, American presidents and Congress have refused to accept any space arms control that could "snare"[31] the US into giving up a key advantage. Washington has been more in favour of an instrument that is "equitable, effectively verifiable, and enhances the national security of the US and its allies". A report prepared on the US National Security

31. Description of space arms control as used by Dudney to refer to the view of one set of Congressmen. Dudney, n.14, p. 10.

Strategy and the New Strategic Triad by an Independent Working Group on Missile Defence and the Space Relationship, in 2012, clearly identified the triad as a multi-layered defence architecture for homeland and regional missile defence, a modernised, precision, mission versatile nuclear arsenal, and a range of space capabilities and their uninterrupted use.[32] The report also recommended to the US government to "reject the draft EU Code of Conduct for Space" and create a "21st century Brilliant Pebbles Space-based Missile Defence Program".[33] This school of thought underscores the need for eventual deployment of space-based interceptors if the US has to have a multi-layered and integrated missile defence. With this in view, there is a recommendation that the US should avoid getting entangled in international agreements that could end up significantly limiting US freedom of action. Moreover, the US would not be able to verify or monitor whether others were complying with the restrictions and might only end up impeding its own capabilities "while allowing less scrupulous signatories to flaunt (*sic*) the largely unverifiable EU CoC".[34]

It is difficult at this moment to predict whether the return of a Republican to the White House in 2016 might make such views more popular. For the time being though, the official view in the US is that it is in everyone's interest to act responsibly and protect the safety and sustainability of the space domain. "A more cooperative, predictable environment enhances US national security and discourages destabilising crisis behavior".[35] The sad reality of this demand is that in getting to such an instrument, the US too would have to tie its hands in some form in order to get others to agree to reining in their capabilities that have the potential to cause harmful interference. The US cannot hope for an "equitable and effectively verifiable" mechanism that nevertheless keeps it above others. In any case, the vulnerabilities for the US are disproportionately higher and, hence, its need for others to follow some rules of the road is also that much greater. It is keeping this in mind that the US STRATCOM that is responsible for providing space situational awareness has entered into agreements with

32. "US National Security Strategy and the New Strategic Triad", Report by Independent Working Group on Missile Defence and Space Relationship, published by the Institute for Foreign Policy Analysis, Inc, April 2012. p. 3
33. Ibid., p. 6.
34. Ibid., p. 12.
35. Loverro, n. 3.

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as many as nearly two dozen launch providers and satellite owners to provide collision warnings.

A Department of Defence (DoD) factsheet released on the ICoC clearly states, "As more countries and companies field space capabilities, it is in our interest that they act responsibly and that the safety and sustainability of space is protected. A widely-subscribed Code can encourage responsible space behavior and single out those who act otherwise, while reducing the risk of misunderstanding and misconduct." What has appealed to the US about the ICoC is the fact that it focusses on activities and not unverifiable capabilities. It is in this context that it is seen as strengthening national security.

US space strategies and policies are known to shift with changes in the White House and Congress. There is no way of guaranteeing, therefore, that the current pragmatism in favour of multilateralism, or a rules-based approach to space security would persist after the 2016 elections. However, it should nevertheless be clear to the US leadership, irrespective of its political orientation, that outer space is a medium that cannot be appropriated as a national asset. Its usage and integration in the economies, societies and militaries of nations across the globe is a reality that the US will have to reconcile with. Cooperation and collaboration to build means of collective deterrence would, therefore, be far more useful and effective in the future rather than returning to the times when the US believed that it could achieve and sustain space dominance. It still might be the player with the most wide-based spectrum of capability. But it is not immune to the counter-space capabilities of others. If all are to continue to sustainably use the medium of the high ground, then pragmatism demands that restraint and a spirit of sharing will have to be respected and accepted.