Topic 2: Current and future earth-to-space threats by States to space systems

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Open-Ended Working Group on reducing space threats through norms, rules, and principles of responsible behaviours

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Panelist: Ms. Victoria Samson, Washington Office Director, Secure World Foundation

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Thank you, Mr. Chair. My name is Victoria Samson and I'm the Washington Office Director for the Secure World Foundation. Secure World Foundation is a private operating foundation dedicated to the secure and sustainable use of outer space for the benefit of all peoples of the Earth. We work with governments, intergovernmental organizations, industry, academia, and civil society to develop and promote international cooperation to achieve the secure, sustainable, and peaceful uses of outer space. As such, we are delighted to participate in the second session of this Open-Ended Working Group and its mandate "to make recommendations on possible norms, rules and principles of responsible behaviours relating to threats by States to space systems."

I am honored to be here on the panel to discuss "Topic 2: Current and future earth-to-space threats by States to space systems." Today, I have been asked to address the following questions: What are the overall trends in the development, testing and deployment of direct-ascent antisatellite weapons? What types of platforms have been used? And what has been the impact of past tests on the space environment and on the space-based activities of third parties?

I have been given a time constraint for my remarks, which is probably for the best as I can talk a very long time on this issue if allowed. For longer analysis of earth-to-space threats (and other types of counterspace capabilities), please visit Secure World Foundation's website for our document which is freely available to all titled, *Global Counterspace Capabilities: An Open Source Assessment.* I am very happy to report that we have the executive summary translated into all the official UN languages: English, French, Spanish, Russian, Chinese, and – as of last week – Arabic.

The security and stability of space has been a concern since the beginning of the Space Age. It is more acute now, however, because more than 80 countries have satellites in orbit and there is a rising dependence on space capabilities for such critical needs as economic development, environmental monitoring, and disaster management. Although space security had historically been perceived as

relevant only to the geopolitical superpowers, nearly every person on this planet now uses space data in some way and thus benefits from a predictable space environment with reliable access to that information.

Today, a number of countries are developing counterspace and anti-satellite (ASAT) weapons which are capable of deceiving, disrupting, denying, degrading, or even destroying objects in space. The incentive to develop, and potentially use, these weapons stems from the growing role that space capabilities play today in every modern military force, particularly those of the major nuclear powers. Disrupting an opponent's space capabilities might be considered in a military setting, but it could also lead to nuclear escalation and create long-term risks even after the war ends.

I will point out that although while many countries are pursuing significant research and development programs involving a broad range of destructive and nondestructive counterspace capabilities, only nondestructive capabilities are actively being used in current military operations.

Some ASAT capabilities are destructive in nature, physically striking an object in space and causing it to break up. While no country has ever attacked another country's space object in this way, the mere testing of destructive ASAT weapons represents some of the most significant debris-generating events in history that are creating problems for operational satellites today.

There has been a recent uptick in destructive anti-satellite weapons testing, which is concerning because such tests can result in long-lived debris that can harm other satellites in orbit. They also can establish the precedent that ASAT weapon tests are acceptable and thus encourage more countries to conduct them. That in turn runs the risk of inadvertent escalation or even possible deliberate use of ASAT weapons during a conflict if this proliferation becomes more prevalent.

During the early years of the space age, the only two countries to test ASAT weapons systems were, chronologically, the United States and the then-Soviet Union. There was a decade-long pause in these tests at the end of the Cold War, but they eventually resumed with the involvement of two more countries: China and India.

The destructive ASAT weapons tests that have been held since the 1960s have created over 6300 trackable pieces of orbital debris, more than 4,300 of which are still around and pose hazards to satellites. And given the altitudes of some of the debris created by these tests, they may continue to be around for years, if not decades more.

Secure World Foundation has put together an infographic on the debris created by destructive ASAT tests. It is available on our website, plus there are hard copies in the back. It illustrates that the sheer force of impact can spread debris out from these tests well beyond that altitude at which point the impact was made, at times hundreds or even 1000-plus kilometers farther out. This is significant because the higher up the debris is, the longer it will take to deorbit and thus the longer it can threaten other space objects, satellites, or space stations.

In discussing direct-ascent (DA)-ASAT programs, I am referring to those systems where there is an interceptor launched from a terrestrial platform (which can be ground-, sea-, or air-based) and which destroys its target by directly impacting it. The ground-based platforms can be fixed silos or mobile platforms.

The targets for DA-ASAT tests historically have usually been in Low Earth Orbit (LEO), and below 880 km. Although there has been one notable exception where an interceptor was launched to what has been reported to be 30,000 km, which is nearly GEO; it should be noted that it is not clear that it was attempting to actually intercept a target and in any case, did not impact any target.

Some sort of tracking capability is also needed for a DA-ASAT capability; we often see this tracking capability emerging from indigenously-produced space situational awareness (SSA) systems.

During the early stages of DA-ASAT development in the 1960s, research and development programs considered using nuclear warheads on the interceptors with the idea that they would destroy their target either via a fireball or an electromagnetic pulse; thankfully, that approach was re-considered and thus programs shifted toward interceptors that strive to kinetically impact their targets. DA-ASAT interceptors have historically evolved from national ballistic missile capabilities and often have been interwoven with ballistic missile defense programs.

I will now briefly go over the DA-ASAT capabilities of the four countries that have held destructive DA-ASAT tests, going in chronological order.

US: During the Cold War, the U.S. military had multiple efforts to develop DA-ASAT capabilities. Some of those efforts remained on the drawing board and several were tested in space, but none reached operational status. While the United States does not currently have an operational, acknowledged DA-ASAT capability, it does have operational midcourse sea-based missile defense interceptors that have been demonstrated in an ASAT role against a low LEO satellite; furthermore, it could potentially use its ground-based missile defense interceptors to target satellites in LEO and possibly some satellites in highly elliptical orbits with perigees that dip down to these altitudes.

Russia: Russia has long had the potential for a DA-ASAT capability through its historical ballistic missile defense capabilities and had DA-ASAT development programs in the past that never fully became operational. The Russian DA-ASAT capabilities currently consist of three primary programs which have direct or indirect counterspace capabilities that are launched off of ground- and air-based platforms. All three have their roots in Soviet-era programs that have been revived or reconstituted in recent years. Russian DA-ASAT systems do not appear to have the capability to reach targets beyond LEO.

China: China has at least one, and possibly as many as three, programs underway to develop DA-ASAT capabilities, either as dedicated counterspace systems or as midcourse missile defense systems that could provide counterspace capabilities. China has engaged in multiple, progressive tests of these capabilities since 2005, indicating a serious and sustained organizational effort. Chinese DA-ASAT capability against LEO targets is likely mature and may be operationally fielded on mobile launchers. Chinese DA-ASAT capability against deep space targets (MEO and GEO) is likely still in the experimental or development phase, and there is not sufficient evidence to conclude whether it will become an operational capability in the near future.

India: For many years, Indian officials said that they had an inherent but untested ASAT capability via its long-range ballistic missile program. It was in 2019 where India demonstrated (via its ballistic missile defense system) a DA-ASAT capability where it destroyed one of its satellites with a missile defense interceptor; this target was in low LEO.

So, given this overview of the current state of DA-ASAT programs, what can be done to mitigate this threat to the space environment? Given the growing global reliance on satellites and space applications, many in the international community have begun calling for a ban or prohibition on the testing of destructive ASAT weapons. In April of this year, the United States became the first country to declare a commitment to no longer conduct destructive ASAT missile tests; this declaration was soon followed by similar ones by Canada, New Zealand, and – as of yesterday – Japan.

SWF applauds this commitment and urges other countries, even those not interested in destructive ASAT weapons, to do the same. Doing so would send a strong signal to the international community that they are committed to the long-term sustainability of space and for delegitimizing the testing of these weapons against satellites.

DA-ASAT tests have made operating in low Earth orbit more dangerous for years to come. All satellite operators and crewed vehicles will need to spend time, effort, and fuel on avoiding collisions as the debris from these tests deorbits and gradually reenters the Earth's atmosphere.

The international community must also lay the foundations to be able to verify future agreements. Space situational awareness has been a top priority for many countries for more than a decade now and includes monitoring and characterizing activities in space. These SSA capabilities could form the foundation of a verification regime for an ASAT test ban or other agreements on irresponsible behaviors in space.

I would like to end my remarks with my warm support of this OEWG process. Simply holding these discussions is broadening awareness globally about the complicated structure of space security and the ways in which the multilateral process can shore it up.

The content of the discussions is illuminating too, reflecting a spectrum of responses in terms of what activities countries perceive to be destabilizing in space, what they deem responsible behavior to be, and how those involved in space should be held accountable for their actions. Whether the international community comes to a total agreement on any of this, it is helpful from a transparency perspective to have these beliefs spelled out and made public.

It is likely that after these sessions are over, there will be broad concurrence on at least some norms of responsible space behavior. There is nothing preventing countries from taking what they have found useful in these group discussions and incorporating them unilaterally in their space activities. In addition, these norms could become the foundation of future UN resolutions and, if widely disseminated, could even lead to legally binding agreements.

This group will not be able to resolve all security concerns about space, because no single solution or approach can do that, but it could make progress on some of the most pressing challenges, helping make space safer, more stable, and more predictable for all.

Thank you to the chair and distinguished delegates for your attention. I look forward to my fellow panelists' remarks and to questions from the audience to delve deeper into the topic of earth-to-space threats.