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The U.S. ASAT Test Ban: Implications for Security

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On April 18, 2022, Vice President Kamala Harris announced that the United States had adopted a unilateral ban on conducting direct-ascent anti-satellite (ASAT) missile testing. Harris called on other nations to make similar commitments and work together to establish a new international norm for responsible behavior in space, which would benefit all nations.[1] The Biden Administration's fact sheet states that the one-sided ban on satellite destruction demonstrations would advance U.S. interests by addressing "the most pressing threats to the security and sustainability of space," that is, long-lived space debris. It has been suggested that the declaration may have been timed to support discussions at an upcoming United Nations forum on norms of behavior in space.[2] The fact sheet cited the Chinese 2007 and Russian November 2021 tests involving destructive ASAT missiles, both of which created orbital debris that threaten to cause damage to satellites and the International Space Station for decades to come.[3] The announcement builds on the July 2021 memo issued by Defense Secretary Lloyd Austin announcing the Department would refrain from tests generating *long-lived* space debris.[4]

It is useful to note what the unilateral ban does not address. The ban does not impact the direct-ascent ASAT test plans of either Russia or China. It does not affect the development, testing, acquisition, or operation of Russian or Chinese ASAT weapons of any kind. The ban does not address space threats posed by other nations. The declaration also does not call for a treaty to prohibit the development or use of such weapons. In other words, this unilateral statement

has no effect whatsoever on hostile counterspace weapon development activities or operations. Moreover, for the United States, the ban does not affect testing of ASAT weapons, other than direct-ascent missiles. Testing of non-kinetic (or non-destructive) weapons, such as terrestrial- or space-based directed energy weapons or jammers, is not addressed. The announcement is not a call to stop the testing of other types of ASAT weapons, to include co-orbital weapons, even though they might result in a collision that causes orbital debris -- although one could imagine the political mountain Department of Defense officials would have to climb to justify the testing of any type of orbital debris-causing weapons. The politics surrounding this decision may present problems for other weapon programs and are addressed below.

An Empty Gesture

The United States has had nuclear, directed energy, and kinetic energy ASAT programs in the past. Yet, after the mid-1980s, such programs have not been a focus of U.S. weapons development or operation. Moreover, out of all the U.S. kinetic energy direct-ascent ASAT programs from the 1960s through 1980s, only one test, conducted in September 1985, actually involved destroying a satellite that resulted in orbital debris.[5] So, the unilateral ban adopted by the Biden Administration was put in place despite the fact that the last destructive U.S. anti-satellite weapon test was conducted 37 years ago when the Air Force launched an ASM-135A missile from an F-15A and successfully destroyed a U.S. satellite 345 miles above the Earth.

Since then, there was one other U.S. deliberate space collision event, the Burnt Frost mission in 2008, which some would prefer to label an "ASAT test." This label misleadingly lumps the United States in with China and Russia as nations that have recklessly conducted debris-generating ASAT tests in the 21st century. Russian and Chinese officials have predictably criticized the United States for this "demonstration."[6] In February 2008, in a special one-off mission, the Department of Defense leveraged Missile Defense Agency (MDA) and U.S. Navy expertise to shoot down a failing U.S. government satellite, launched in December 2006. That out-of-control and descending satellite carried toxic fuel, which could have posed a lethal danger to populations should it have been allowed to reenter. Once the decision was made to try to bring the satellite out of orbit in a calculated or controlled way, the nation had only three months to develop a solution to prevent potential catastrophe. A team involving MDA, the Navy, U.S. Strategic Command, the National Reconnaissance Office, and NASA, among other government and industry participants, was put together. MDA modified the weapon system and three Standard Missile-3 ballistic missile defense interceptors in that span of time. The operation leveraged remote sensors and a command and control and battle management system for a successful one-time intercept of a satellite in very low orbit.[7] Not only did the team destroy the satellite, it did so in such a way as to limit the debris in low earth orbit.[8] The Burnt Frost mission was not designed to demonstrate an ASAT capability. The modified SM-3 missile was not mass produced and then integrated into the fleet for operation. No other Burnt Frost-like missions have been conducted since.

So, going back to the 20th century, the Pentagon and past Administrations had already been incorporating a fairly consistent judgment into their policies, decisions, and defense plans that the destruction of satellites in orbit is not in the interest of the United States. The Biden Administration's declaration, in other words, has little meaning for actual U.S. policy and no meaning for opponents; it is an empty gesture. The problem with this is that Russia and China, the ultimate targets of this announcement, will also view it as an empty gesture, which means the administration is not likely to achieve the main objective of the ban -- convincing other nations (China and Russia) to adopt an ASAT test ban and settle on a new space norm.

Shame On You

Historically, direct-ascent ASAT tests have been among the biggest producers of orbital debris. Yet the reality is that there are only two nations that are conducting tests that generate the hundreds of thousands of pieces of debris that are the true cause for concern – Russia and China. The administration's declaration acknowledges that Russian and Chinese ASAT tests are the problem. So, this declaration is aimed squarely at Moscow and Beijing. "We are the first nation to make such a commitment [to banning destructive ASAT tests]," Harris said in her speech announcing the ban. "We must write the new rules of the road. And we will lead by example."[9] Deputy Assistant Secretary of Defense for Space and Missile Defense, John Hill, affirms this: "This [ban] is not disarming, we're not disarming. This norm is not focused on any technological capability, but on behavior that we want to dissuade and encourage people to not undertake."[10] In other words, wrote analyst Brian Weedon, this ban, "puts a lot of pressure on Russia and China, who have been saying that they're against weaponization. If they really believe that, then it should be easy for them to sign up to this and put up their own pledges. Because they're also using space."[11] So this is the objective—to pressure or, perhaps to put it more bluntly since there is no means to compel action here, to shame Russian and Chinese leaders into modifying behavior. But is this prudent?

For shaming and "leading by example" to work, of course, the targeted countries must share the same moral framework, understanding of what constitute reasonable behavior, and concern about the consistency of their words and their behavior. While you might shame someone who shares your principles and moral codes, you would be hard-pressed to successfully do so with someone who is not so like-minded. The Biden ban, in other words, assumes that Russia and China can be morally shamed into changing their behavior and adopting American sensibilities for right and wrong behavior. Yet there is no evidence that this can work in any reliable way. There is considerable evidence that the leaders in Beijing and Moscow are beyond such shaming and are not looking to the United States as an example for how to behave. Neither has shown interest in doing so. In fact, while the United States clearly desires to prevent conflict from escalating to space, according to retired Air Force General Kevin Chilton, "many of our adversaries do not share this goal. Instead, they see

developing and fielding capabilities to hold our systems on orbit at risk as an opportunity to gain decisive advantages."[12]

The current international legal "bans" in place on aggression against other states, genocide, and horrific treatment of populations are clearly not having an effect on either Russia or China today. Despite the existence of countless international laws and United Nations declarations against unprovoked war, international aggression and genocide, Russian President Vladimir Putin is prosecuting an unjust war against Ukraine, causing senseless suffering and engaging in the wanton destruction and tragic slaughter of the Ukrainian people, actions that are condemned around the world. Since February 24, 2022, Russia has been indiscriminately targeting civilians and refugees and laying waste to cities, schools, hospitals and housing.[13] Harris acknowledged the Russian brutality in her speech. Yet it is clear that shame in the sense underlying U.S. policy has no place in Putin's world. Since Putin is clearly acting according to his own ambitions and Russia's interests, which are justified by Putin's worldview and Russian strategy, one should ask, why would he care about a unilateral, empty-gesture ban by the United States? More than likely, he interprets such gestures as U.S. trickery or a sign of weakness, as opposed to behavior to emulate.

And what of China? China's Xinjiang internment camps, where there is torture and general maltreatment of human beings (largely Muslim men and women from the Uighur, Kazakh and Kyrgyz ethnic minorities), have drawn moral condemnation across the globe. A 2021 Amnesty International report captured the details of this inhumane behavior.[14] China also acts with utter disregard to the sovereignty claims of other nations in the South China Seas, violating the rights of other nations. Beijing's maritime claims pose a significant threat to the freedom of the seas, impact security operations, risk provoking international live-fire incidents, and hinder free trade and commerce.[15] Shame, again in the sense underlying U.S. policy, has no place in President Xi Jinping's world. Since he and the People's Liberation Army are clearly acting according to China's interests and justify their actions by their strategy and world view, one should ask, why would the Chinese leadership care about a unilateral, empty-gesture ban by the United States? Again, more than likely, he interprets such gestures as U.S. trickery or a sign of weakness, as opposed to behavior to emulate.

In as much as nuclear test bans did not stop the development of nuclear weapons, it is reasonable to conclude the unilateral direct-ascent ASAT test ban will not stop the development of ASAT weapons, future ASAT operations, or even put a halt to direct-ascent ASAT testing. Considering the nations at play here, moral shaming does not appear to be a sound tactic for protecting U.S. satellites and convincing other nations to adopt new space norms.

Unforeseen Consequences

While the announcement of the unilateral direct-ascent ASAT test ban may appear to be benign, it could have some harmful effects on the nation's best security interests. One risk is that policy and decision-making influencers in the administration, on Capitol Hill, in think tanks or news media may come to view the ban as a sufficient deterrent to Russia's and China's bad behavior in space—an alternative to the development of space control enforcement tools, to include counterspace weapons, and the political language needed to support U.S. military action in space. Alabama Representative Mike Rogers raised this very point, stating that the announcement "mistakes activity for achievement" and "does nothing to deter our adversaries in an escalating war fighting domain."[16] As noted above, the ban does not affect development of adversary counterspace systems. Yet it might have the effect of causing the United States to avoid developing counterspace weapons useful in deterring aggressive behavior in that critical domain. While space debris poses dangers, the "most pressing threat" to U.S. space capabilities is actually the deliberate use of ASAT systems against them. After all, to drive home the truth behind this assessment, the counterspace threats posed by China and Russia are what generated the energy behind the nation's decision to create the Space Force and reestablish U.S. Space Command.

It is also the case that missile defense interceptors are sometimes identified as possible ASAT weapons.[17] While the nation skirted this issue in the wake of Burnt Frost (in large part because the administration and Defense Department made a concerted effort to disassociate the missile defense mission from the ASAT mission), a concern about the possible blurring of the missions might arise in a different political climate. Related to this is the subject of missile defense testing. Given the closing speeds involved in an engagement, missile defense intercepts in space generally result in the obliteration of the target, essentially leaving behind no long-lived orbital debris.[18] Foreign and domestic opponents of missile defense, however, might use the inevitable ambiguity between these two different kinetic energy engagements to lay the groundwork for a rhetorical attack on missile defense testing.[19] The Administration should continue to press home the significant differences between missile defense and ASAT testing when it comes to the generation of debris to head off a surge of political animus against missile defense intercepts in low earth orbit.

Finally, should there ever be a need to conduct "Burnt Frost II," to execute another mission out of concern for population safety, the administration may have tied its own hands using exceptionally tight knots, making it exceedingly more difficult politically to make an argument for such a prospective mission. The test ban may provide just enough fodder for arguments among decision makers who are against conducting such a mission in order to avoid potential public and international backlash.

Conclusions

Throughout the space age, the United States has striven to keep space free and safe for military, civil, and commercial satellite operations. So, the Biden administration is correct to point out the folly of creating orbital debris, and that efforts should be made to avoid activities in space that generate debris. Yet Russia and China clearly do not cling to the same values as the United States and, based on their own recent testing activity, do not appear to view debris in space in the same manner as do Americans. The unilateral ASAT test ban declaration, instead of establishing a secure basis for activities in space, may lead U.S. leaders away from advancing the necessary intellectual frameworks, developing deterrence and defense doctrines, and deploying systems required to support free and safe space operations for all nations.

[1] White House, *Fact Sheet: Vice President Harris Advances National Security Norms in Space*, April 18, 2022, available at HTTPS://WWW.WHITEHOUSE.GOV/BRIEFING-ROOM/STATEMENTS-RELEASES/2022/04/18/FACT-SHEET-VICE-PRESIDENT-HARRIS-ADVANCES-NATIONAL-SECURITY-NORMS-IN-SPACE/.

[2] Jeff Foust, "U.S. ASAT ban meant to support U.N. discussions on space threats," *SpaceNews Online*, April 25, 2022, available at https://spacenews.com/u-s-asat-ban-meant-to-support-u-n-discussions-on-space-threats/.

[3] Sandra Erwin, "DoD a main proponent of anti-satellite test ban: 'We are not disarming', *SpaceNews Online*, April 20, 2022, available at https://spacenews.com/dod-a-main-proponent-of-anti-satellite-test-ban-we-are-not-disarming/.

[4] Department of Defense, "Memorandum for Secretaries of the Military Departments, et al.," July 7, 2021, available at https://media.defense.gov/2021/Jul/23/2002809598/-1/-1/0/TENETS-OF-RESPONSIBLE-BEHAVIOR-IN-SPACE.PDF.

[5] Kaila Pfrang and Brian Weedon, *U.S. Direct-Ascent Anti-Satellite Testing*, Secure World Foundation, April 2021, available at https://swfound.org/media/207180/swf_us_da-asat_fact_sheet_apr2021.pdf . The U.S. Army did have a program in the 1990s to develop and validate the Kinetic Energy ASAT using proven technologies, but the program never advanced to the flight-testing phase, despite significant developmental progress.

[6] Dwayne A. Day, "Burning frost: the view from the ground: shooting down a spy satellite in 2008," *The Space Review*, June 21, 2021, available at https://www.thespacereview.com/article/4198/1; Pfrang and Weedon, *U.S. Direct-Ascent Anti-Satellite Testing*, April 2021, available at https://swfound.org/media/207180/swf_us_da-asat_fact_sheet_apr2021.pdf . According to Pfrang and Weedon, "The SM-3 and GBI interceptors represent a potentially large and flexible DA-ASAT capability that could be used against adversary military satellites in LEO in a future conflict."

[6] James Oberg, "U.S. Satellite Shootdown: The Inside Story," *IEEE Spectrum*, August 1, 2008, available at https://spectrum.ieee.org/aerospace/satellites/us-satellite-shootdown-the-inside-story.

[7] Ibid.

[8] It was calculated that about 99% of the debris left in orbit would reenter the atmosphere within a week. Day, "Burning frost: the view from the ground: shooting down a spy satellite in 2008," June 21, 2021.

[9] The White House, "Remarks by Vice President Harris on the Ongoing Work to Establish Norms in Space," *Briefing Room*, April 18, 2022, available at https://www.whitehouse.gov/briefing-room/speeches-remarks/2022/04/18/remarks-by-vice-president-harris-on-the-ongoing-work-to-establish-norms-in-space/.

[10] Erwin, "DoD a main proponent of anti-satellite test ban," April 20, 2022.

[11] Quoting Brian Weedon from the Secure World Foundation in Erwin, "DoD a main proponent of anti-satellite test ban," April 20, 2022.

[12] Gen. Kevin Chilton (Ret.), "The anti-satellite test ban must not undermine deterrence," *Defense News Online*, April 29, 2022, available at https://www.defensenews.com/opinion/commentary/2022/04/29/the-anti-satellite-test-ban-must-not-undermine-deterrence/.

[13] Anton Troianovsky, "Atrocities in Ukraine War Have Deep Roots in Russian Military," *New York Times*, April 17, 2022, available at https://www.nytimes.com/2022/04/17/world/europe/ukraine-war-russia-atrocities.html.

[14] Anna Schecter, "New details of torture, cover-ups in China's internment camps revealed in Amnesty International report," *NBC News*, June 10, 2021, available at https://www.nbcnews.com/news/world/new-details-torture-cover-ups-china-s-internment-camps-revealed-n1270014.

[15] U.S. Department of State, "China's Maritime Claims in the South China Seas," *The Washington Foreign Press Center in Washington, D.C.*, January 24, 2022, available at https://www.state.gov/briefings-foreign-press-centers/chinas-maritime-claims-in-the-south-china-sea.

[16] Courtney Albon, "U.S. to encourage other nations to join ban on anti-satellite weapons testing," *Defense News Online*, April 21, 2022, available at https://www.defensenews.com/battlefield-tech/space/2022/04/21/us-to-encourage-other-nations-to-join-ban-on-anti-satellite-weapons-testing/.

[17]"The SM-3 and GBI interceptors represent a potentially large and flexible DA-ASAT capability that could be used against adversary military satellites in LEO in a future conflict." See Pfrang and Weedon, U.S. Direct-Ascent Anti-Satellite Testing, April 2021.

[18] According to the then-Director of the Missile Defense Agency, LTG Patrick O'Reilly (based on analysis completed for space-based interceptors), some fragments would remain following an intercept in space: "Debris resulting from the interception of a ballistic missile would simply continue on the same trajectory it originally had at the interception point and fall back to earth. In addition, debris from the interceptor itself would move on a hyperbolic trajectory that would be fast enough to completely escape Earth's gravity. The small chance of creating persistent debris could be eliminated by imposing reasonable operational limitations on the intercept geometries." LTG Patrick O'Reilly, "Responses to Questions on the Institute for Defense Analysis (IDA) Congressionally-mandated study of Space Based Interceptor Element of the Ballistic Missile Defense System," June 22, 2011 Letter to Senator Jon Kyle, available at http://aerospace.csis.org/wp-content/uploads/2018/09/OReilly2011.pdf.

[19] See, for example, HUANG Weiguo, et.al, China Academy of Engineering Physics, Oct 13-14, (? Year) made available by the Secure World Foundation at https://swfound.org/media/52436/huang_missile_defense_and_debris.pdf.

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