Analysis

Missile Test And Space Ventures Increase Worries Over Debris

By **Daniel Wilson** · Listen to article

Law360 (November 24, 2021, 10:08 AM EST) -- An ongoing buildup in the commercial space industry and a recent Russian missile test have brought renewed attention to how best to mitigate the growing issue of space debris, which travels at high velocity and can damage satellites and spacecraft.

Russia's Nov. 15 anti-satellite missile, or ASAT, test prompted international condemnation, both due to a lack of prior notification to other countries and for creating more than 1,500 new pieces of space debris, according to the Biden administration.

While there has yet to be any major collision involving space debris, the growth in debris over time raises the likelihood of such an incident, creating significant risk for both governmental space operations and the nascent commercial space industry, said Henry Hertzfeld, a professor at George Washington University's Space Policy Institute and its law school.

"Let's call it a potential future huge problem with some current incidents that certainly point that way," he said. "We haven't had an accident of that sort in space that's caused a lot of economic damage, yet. But it's that dagger that's threatening. ... If we continue the way we [are] treating space and space objects, it's going to be a big problem."

There are theoretically ways to hold Russia liable for the test under international space treaties, but diplomatic, military and practical concerns all limit both the opportunity for other countries to take formal action and the likelihood that any will.

The landmark 1967 Outer Space Treaty, although a "fairly ambiguous document," does, for example, suggest there is the potential for a case to be made to hold Russia responsible for the effects of any damage or interference from debris created by its test, said Greg Autry, a professor of space leadership, business and policy at Arizona State University.

"The question is, who would pursue this? And where would you do it? And most likely, they would just ignore it, and there's no enforcement mechanism," said Autry, who also sits on the Federal Aviation Administration's Commercial Space Transportation Advisory Committee.

One potential forum is the International Court of Justice, but like the treaty itself, that also lacks a firm enforcement mechanism. And it could be difficult to prove a specific violation of any space treaty even if an argument could be made that Russia had violated principles such as cooperation and using space for peaceful purposes in spirit, Hertzfeld said.

Also, other countries may fear creating a precedent that restricts their own activities, said Rebecca van Burken, a policy associate at government affairs firm Boundary Stone Partners who specializes in commercial space issues and is also pursuing a law degree focused on technology and space-related law.

"No country really wants to go to court based on the potential of [damage] happening again, because that will ultimately limit and hold them liable for, potentially, something they might do," she said.

And any effort to codify specific enforcement rules, based, for example, on the likelihood a particular event creates "harmful contamination," would be very difficult, said Trey Spetch, the senior director of strategic space mission capabilities at Peraton.

"If you actually try to quantify the risk probabilities and consequences for use in enforcement rules, you will quickly find yourself going down a very deep and controversial rabbit hole," he said.

So diplomatic efforts are likely to be more fruitful than trying to pursue any sort of enforcement, similar to when China conducted its own heavily criticized anti-satellite test in 2007, according to Autry.

One potential course of action could be to try to convince Russia that future tests are not within its own best interest, similar to how other nations responded to the Chinese test. China was not formally sanctioned, but other countries pointed out the risks of making it more difficult to use a valuable spot in orbit and that "it also made it harder for China to put satellites [into that orbit]," Hertzfeld said.

But determining what Russia would consider to be within its own self-interest is more difficult than when China conducted its test. That test was essentially aimed at proving to the world that it had the technology to shoot down a satellite, whereas it was already known that Russia had that capability, so the purpose of its recent test is not clear, according to Hertzfeld.

Despite Russia's potential refusal to be involved, the U.S. and other nations could also make a renewed effort to establish related international agreements, for example by limiting potentially harmful activities in low earth orbit, or LEO, where space stations and many satellites sit.

"I think that the best thing we need to do is to try to get nations to stop doing these types of kinetic testing, particularly a country like Russia, which even going back to Soviet days had already demonstrated they've got the capability," said Frank Slazer, president and CEO of industry group the Coalition for Deep Space Exploration.

Emphasizing the importance of mitigating debris to the nascent commercial space industry and creating an international framework that makes the standards more consistent for companies in different countries would also help to address the issue, according to van Burken.

"Because at the moment, we have forum-shopping issues," she said. "A lot of companies are going over to the [European Union] because they have less strict licensing restrictions."

There are already tens of thousands of pieces of space debris in orbit, not counting the smallest pieces that are difficult to track. The worst-case scenario is that increasing amounts of debris potentially clutter up LEO, leading to the so-called Kessler effect, where collisions between pieces of debris continue to create more debris, rendering that space potentially unusable for centuries.

That risk should give even China, often reluctant to adhere to international treaties, a strong incentive to minimize the growth in debris, Autry said.

Even if the worst-case scenario is avoided, each incident that creates more space debris not only raises the potential of a collision, but also leads to potentially millions of dollars in indirect consequences, such as driving up the costs of insurance for the commercial space industry and choking off its growth.

"There's just so much economic potential there for all nations to tap into," Slazer said. "And ... you've got human lives at stake, as well, and the future development of this next stage of our economic growth and development is at risk if these types of activities continue."

Efforts by governments, acting through international agreements, to encourage further development of emerging technologies to collect, destroy or move debris into a less dangerous orbit could also help mitigate the problem, according to Autry, who suggested establishing an international bounty system for collecting debris as a way of doing that.

"I think that's a hard treaty to negotiate," he said. "But it's in everybody's best interest to do it."

--Editing by Marygrace Anderson and Alyssa Miller.

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