

Review Article

Russian Space Director: Wild Threats for the Iss

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Abstract

Dmitry Rogozin, the Russian Space Director is known to be provocative online. The announcement of new sanctions against Russia provoked a strong reaction from the head of Russia's space program, Dmitry Rogozin, yesterday, who seemed to threaten that the restrictions would destroy Russia's partnership with NASA and lead to the demise of the International Space Station. Though Rogozin is known for his bluster and provocative statements, his comments did spark concern over what NASA would do if the Russians abruptly pulled out of the ISS program — a move that could be a substantial problem.

Introduction

President Joe Biden announced the new sanctions on Thursday in response to Russia's invasion of Ukraine, claiming the sanctions would "degrade [Russia's] aerospace industry, including their space program." A list of the sanctions released by the White House mentioned denying exports of "sensitive technology" like semiconductors, telecommunications, and avionics. In response, Rogozin, the head of Russia's state space corporation, Roscosmos, fired off a series of threatening tweets about how the sanctions could impact the ISS program. Notably, he claimed that without Russia, there would be no one to correct the space station's orbit, and the ISS could come crashing down on the US, Europe, India, or China. "Either we're going to stay together, or the thing is not going to work". There is some truth to what Rogozin is saying. NASA does rely on Russian propulsion to help control the International Space Station's attitude, or position and orientation in space, and periodically boost the station on its orbit around Earth. Without Russia, NASA would have to engineer a new solution to help keep the station on the right path in space, so that the vehicle does not slowly fall out of orbit and enter Earth's atmosphere. "If the Russians walk away, then you've got this massive object that's going to come back in randomly somewhere over the Earth," Wayne Hale, former program manager of NASA's Space Shuttle and a member of NASA's Advisory Council, tells *The Verge*. However such a scenario would take quite a while to manifest, possibly giving NASA some time to devise an alternate solution. "It's not like a week, it'll probably be several years," says Hale. But the Russians heavily rely on NASA to keep the space station active, too. NASA also helps to control the space station's position in orbit, and the space agency is solely responsible for generating elec-

tricity for the entire vehicle. When it comes to the ISS, the NASA and Roscosmos relationship is a symbiotic one, and either party leaving would spell trouble. "Either we're going to stay together, or the thing is not going to work," says Hale. As of now, there's no reason to worry about the demise of the ISS. Both NASA and Roscosmos say they are still working to keep the space station afloat. "NASA continues working with all our international partners, including the State Space Corporation Roscosmos, for the ongoing safe operations of the International Space Station," Josh Finch, a NASA spokesperson, said in an email to *The Verge*. "The new export control measures will continue to allow US-Russia civil space cooperation. No changes are planned to the agency's support for ongoing in orbit and ground station operations". Roscosmos also acknowledged in a statement to *The Verge* amid the early hours of the invasion on Thursday that the two organizations are still working together. That cooperation will be necessary, as there are quite a few important events planned for the month ahead. On March 18th, Roscosmos is scheduled to launch a crew of three Russian cosmonauts on board a Soyuz spacecraft, who will join the seven-person crew already on the ISS, according to NASA. That crew includes two cosmonauts, four NASA astronauts, and one German astronaut from the European Space Agency. Then on March 30th, NASA astronaut Mark Vande Hei and two cosmonauts will return to Earth inside another Soyuz capsule, the space agency says. Vande Hei's safe return will rely on Russia.

Despite the need for cooperation right now, Rogozin made some fairly terrifying statements. But despite the need for cooperation right now, Rogozin made some fairly terrifying statements that insinuated the relationship between Roscosmos and NASA is crack-

ing in light of the sanctions. And he painted a grim future scenario for the ISS if there's a complete rift. "Maybe President Biden is off topic, so explain to him that the correction of the station's orbit, its avoidance of dangerous rendezvous with space garbage, with which your talented businessmen have polluted the near-Earth orbit, is produced exclusively by the engines of the Russian Progress MS cargo ships". Rogozin tweeted in Russian, translated by Google Translate. "If you block cooperation with us, who will save the ISS from an uncontrolled de-orbit and fall into the United States or Europe? There is also the option of dropping a 500-ton structure to India and China. Do you want to threaten them with such a prospect? The ISS does not fly over Russia, so all the risks are yours". Plenty of people online tried to derive the precise meaning of Rogozin's tweets, with some wondering if he might actually be threatening to de-orbit the space station over a populated area. What seems more likely is that Rogozin is implying that without Russia stepping in to take evasive measures, the ISS could potentially fall onto one of these countries, which are periodically below the station on its orbit. (The station does actually pass over parts of Russia, but mostly along the country's southern border.) It sounds like a scary scenario, but it's not totally without merit. The altitude of objects in low Earth orbit, like the ISS, decays over time and they need adjustments to maintain their trajectory. And the reality is the ISS does primarily use Russia's cargo spaceships, called Progress, to periodically boost the station's altitude and maintain the vehicle's orbit around Earth.

Whenever they're docked to the ISS, the Progress spacecraft will use their onboard thrusters to give the station a little nudge — either to change the altitude or move it out of the way of debris. Another way Russia can boost the ISS is by using thrusters embedded in the country's Zvezda module, though this option isn't used as much. (There are also thrusters on Russia's new Nauka science module, which accidentally fired and spun up the whole space station in July.) The station thrusters and the Progress spacecraft are also sometimes needed to help control the space station's attitude. Normally, NASA takes care of that with the use of what are known as Control Moment Gyros, spinning wheel devices that don't use propellant and use momentum to control the station's position. However, those gyros can get saturated over time, according to Hale, and the Russian thrusters are used to help with adjustments when the gyros become limited. Without Russia's capabilities, all of this becomes much more complicated and a new solution would be needed. In response to Rogozin's tweets, some online commenters wondered whether American cargo space capsules, like SpaceX's Dragon or Northrop Grumman's Cygnus could be used to boost the station like the Progress ships do. In fact, there is a Cygnus at the station right now, and in April, it will test out a new orbit-boosting capability for the space station. But as of now, neither the Dragon nor the Cygnus are meant to serve as long-term solutions. So far, that rupture has not totally extended to the countries' partnership in civil space. While the thought of the ISS falling to Earth may seem tragic, it's going to have to happen someday. The station cannot live up in space forever. And while the Biden administration wants to extend the station's life through

2030, plans are already being made for how the station will be destroyed eventually. That will entail bringing the station down into Earth's atmosphere in a controlled manner, over a region that is not populated. Since the ISS is such a massive structure, it's likely that parts of it will survive the heated descent through Earth's atmosphere, and NASA wants to ensure the safety of people on the ground.

However, the current tentative plan for de-orbiting the space station also relies on Russia. NASA outlined a concept in January that would entail docking three Russian Progress ships to the ISS, and using the thrusters on those vehicles to help guide the station down into the atmosphere in a safe way. Without Russia's cooperation, that plan will have to change, though NASA did note the Cygnus could be involved somehow. "If the Russians pull the plug and went home and left us up there to our own devices, we would put an emergency program together to try to de-orbit the station with our own systems," says Hale. "And I don't know exactly what that would take the form of". For now, the easiest and safest path forward is continued cooperation between NASA and Roscosmos to both keep the station running and then bring it down safely. But the situation is particularly precarious, especially since Biden said there is a "complete rupture" in US-Russia relations. So far, that rupture has not totally extended to the countries' partnership in civil space, but Rogozin's comments don't provide much comfort. In a recent tweet, Rogozin hinted at more updates to come. "In the meantime, we continue to analyze the new US sanctions to detail our response". he wrote. Featured Videos From The Verge

Investigation at the Russian space organization: billions has been stolen



Figure 1: General Alexander Bastrykin, the Head of Russia's Investigative Committee (a sort of Super Attorney General)

"We have been working in Roskosmos for five years. Billions were stolen there. Billions. And do not see the end. The technology is simple – first exceeds the money, then the family and finally the perpetrator himself," Bastrykin said with an obvious reference to Jaskin, who fled to the west during a business trip. According to Kommersant, he was last seen in Greece. The director of the Roskosmos Institute is now being examined by FSB's secret ser-

vice. The institute is one of the key companies in the rocket industry and develops satellite navigation devices that use satellite navigation. It also controls and resists the space base (including **the ISS**) and electronic devices from the space apparatus to cosmic rays. "He was obviously afraid that the scramble of budget funds would be revealed and therefore he had left the country before the investigation began" source Problem Roskosmos Roskosmos confessed to the robbers but played down them: "The cases designated by the committee of inquiry Alexander Bastrykin is known to the public. " They are also examined and examined by the FSB. There have been reports in the media that internal controls in Roskosmos, presumably ordered by **Russian** President Vladimir Putin himself, have led to the launch of 14 criminal proceedings. Steel and corruption are considered one of the main causes of failure in the Russian space program. Roskosmos chief Dmitry Rogozin has promised to place orders in the organization, TASS said. "We need to put in place, develop an economic and economic audit. Not everyone likes it, but we will go this way," says Rogozin. According to him, Roskosmos must "get rid of the error" and come to the job everyone is waiting for. him. (29)

Conclusions

One month ago I have published my article in foreign scientific journal about the about **the monitoring and dazzling activities** of the ISS in my village Dubnik, District of Nove Zamky, Slovakia. (30, 31, 32) At that time ISS was realized also **several beams attacks** against inhabitants in this region. Aproximately after 2 weeks Russian science authorities have published in the international media information, that they had lift-off the ISS at orbit about 104,5 m higher than it was its former high position in the space. Probably, with this operation of lifting-off they had try to mask visibility of the ISS in our region. In this connection we can see as one reason why **the U. S. President Donald Trump** have many times criticized the concept of **Climatic Changes** only on the basis of **Global Warming**. The real cause of His rejection of existing popular scientific theory on Climatic Changes may be the fact, that **Mr. Former U. S. President D. Trump** may have **more secret informations about realistic activities of the ISS crew personell on the orbit**. (33, 34, 35) First of all, informations about **the ISS interventions into the Weather Modifications in many different regions of our World**. It is clear, that these interventions of the ISS are **violating the International Law, agreements and United Nations (UN) decisions**. I am afraid, that if secret informations of the U.S. President are valid, then we can see this as a **Global Hybrid War (GHW) with Climatic Changes from the ISS against Human Civilization !** In this case we may only condemn activities which, **like AT Dunaj Dubnik**, giving help to ISS crew personell's countries with this Global Hybrid War with Climatic Changes. It may be also an interesting question, why the Western countries delegates at ISS make a secret from their **cooperation with Russia on the orbit** ? Our conclusion is that **the Natural Global Warming** is not the only one cause of the ongoing **Climatic Changes**. Another main cause in our recent World are **artificial interventions into Global** and different **Lo-**

cal Weather from the International Space Station regulated by Russia, helped by companies such as **AT Dunaj Dubnik, Slovakia**. I am afraid that **the ISS is the Global Device of a Climate Criminality and Cannibal Policy**. This is another proof that in our recent World we can see, how **Rain Maker Psychopaths** are causing **negative health effects**, while tending to achieve a **Psychopaths Dictatorship**.

Us and Russia Still Tethered by International Space Station During Ukraine Conflict

But NASA has more independence these days.

Following Russia's invasion of Ukraine, tensions between the US and Russia are particularly strained here on Earth, prompting concerns that friction could inevitably spill over into the two countries' longstanding partnership in space. For now, both NASA and Russia say they are still working together to keep the International Space Station operational, as they've done during past international turmoil. Russia is, by and large, the United States' biggest working partner in space. NASA and Russia's state space corporation, Roscosmos, jointly operate the ISS, an orbiting laboratory that has become the primary space destination for astronauts hailing from America, Russia, and other nations across the globe. Roscosmos and NASA have been working together on the ISS for nearly three decades now, but the US-Russian partnership goes back even further than that. The two space organizations coordinated on Russia's former Mir space station, swapped seats on NASA's Space Shuttle and Russia's Soyuz rocket, and even worked together during the Apollo era on the Apollo-Soyuz test project.

For Now, Both Nasa and Russia Say they are Still Working Together

Since the space partnership has been a lengthy one, this is certainly not the first time that Russia and the US have clashed on the ground while continuing to work together in space. NASA and Roscosmos have continued to cooperate on the ISS during the 2014 invasion of Crimea and even after Russia blew up its own satellite, creating debris that threatened the ISS. Consistent communication between the two organizations is paramount for the safety of the ISS crew, even when tensions flare. "We've been able to keep it compartmentalized for so long," Todd Harrison, director of the aerospace security project at the Center for Strategic and International Studies, tells *The Verge*. "And there's a value to having that relationship between the US and Russia". Currently, seven people are living onboard the International Space Station, including four NASA astronauts and two Russian cosmonauts. NASA says that nothing has changed regarding the schedule of the ISS. "NASA continues working with the State Space Corporation Roscosmos (Roscosmos) and our other international partners in Canada, Europe, and Japan to maintain safe and continuous International Space Station operations," Josh Finch, a spokesperson for NASA, emailed to *The Verge* in a statement a few hours before the invasion began. "NASA and its international partners have maintained a continuous and productive human presence aboard the International Space Station for more than 21 years". However, there may be more options for

NASA to distance itself from the Russian space corporation as the situation becomes more dire on the ground, especially since the dynamic between the organizations has significantly evolved in recent years. “It’s not really an option to just not be in contact about [the ISS],” Makena Young, an associate fellow with the Aerospace Security Project at CSIS, tells *The Verge*. “But basically anything else I think is up for delays or cancellations.”

It’s Not Really an Option to Just Not Be in Contact About [The Iss]

On a more superficial level, it seems likely that any planned trips to Russia or other pleasantries between NASA and Roscosmos will be delayed or canceled. Despite reports that NASA administrator Bill Nelson would be taking a trip to Russia to discuss ISS operations, NASA press secretary Jackie McGuinness confirmed to *The Verge* that there is no trip currently planned. “At the level of exchanges of dignitaries or attending conferences, I would guess that you’ll see a reduction,” David Burbach, a professor at the US Naval War College who teaches space security and international relations, tells *The Verge*. Perhaps the most analogous situation to current events occurred back in 2014 when Russia invaded Crimea. At the time, NASA sent out a memo to employees telling them to suspend contact with Russian government representatives. Travel to Russia was suspended for NASA workers and Dmitry Rogozin, a deputy prime minister in 2014 who now leads Roscosmos, was sanctioned personally, preventing him from entering the United States. NASA was in a much more precarious position in 2014. The space agency had just retired the Space Shuttle in 2011, and without the vehicle, NASA didn’t have a way to deliver people to space. So, for years, NASA relied on Russia’s Soyuz rocket to get its astronauts to and from the International Space Station. While NASA could take some actions, the agency couldn’t completely distance itself from Russia during the Crimea invasion as the agency needed Roscosmos in a fundamental way.

Dmitry Rogozin, the Head of Russia’s Roscosmos Space Corporation

The situation is much different now. In 2020, SpaceX successfully launched two NASA astronauts to the ISS on the company’s Crew Dragon, demonstrating that it could deliver people to and from space for the agency. Now, NASA has the option to fly its astronauts solely on Crew Dragon flights if it wants. And that could give NASA a little more freedom to cut ties with Russia on certain projects. “NASA really doesn’t have a lot of reliance on Russia anymore for civil space programs,” says Young. “So I think that there’s a lot more wiggle room to be a bit more strict than there was in the past”. One project that might be in a precarious position is a planned crew swap between NASA and Roscosmos, where the two organizations would allow personnel to fly on the other country’s passenger vehicles. While NASA has continued flying its astronauts on the Russian Soyuz rocket, Russian cosmonauts have not yet flown on SpaceX’s Crew Dragon. Lately, Roscosmos had begun warming to the idea, and the two organizations are in the midst of finalizing that arrangement, though nothing has been

officially signed. In December, Rogozin announced that Russian cosmonaut Anna Kikina would fly on a SpaceX Crew Dragon in the fall of 2022 as part of the crew swap. NASA confirmed to *The Verge* that there are two cosmonauts currently in Houston training at NASA’s Johnson Space Center, and two NASA astronauts completed training in Russia earlier in February. It’s possible that agreement could be in jeopardy in the future, but for now, it seems to still be moving forward. “Roscosmos continues fulfilling its international obligations to ensure ISS operation; work is also underway on the integrated crew flights agreement.” Oleg Bolashev, chief specialist of the Roscosmos press service, emailed to *The Verge* in a statement.

I Think it is Fair to Say Russia Stands to Lose More than We Do

Roscosmos continues to rely on NASA to keep the ISS running, as NASA spends \$3–4 billion on the project every year. “I think it is fair to say Russia stands to lose more than we do,” Harrison says. He argues that the ISS is the flagship of the Russian space program. “They don’t really have any other achievements to point to of that magnitude,” says Harrison. “So they would be losing a tremendous science platform but also a tremendous status symbol as a space superpower if they didn’t have ISS.”

The ISS isn’t going anywhere anytime soon, but the future of the station is still unresolved. In late December, the Biden administration announced its intention to extend ISS operations through 2030. Roscosmos has been mulling over a similar extension. However, Rogozin told *The New York Times* that such an extension could not happen until the sanctions on two Russian companies were removed. “In order to give us a technical capability to produce whatever is needed for this extension, these restrictions need to be lifted first,” Rogozin said. However, Rogozin also told CNN that “this is a family, where a divorce within a station is not possible”. Outwardly, Rogozin is still showing his support for Roscosmos’ relationship with NASA amid current events while condemning US policy. The NASA and Roscosmos relationship has faced more tests than ever as of late, even beyond the situation in Ukraine. When the Russian military intentionally destroyed one of the nation’s own satellites with a ground missile, the test created thousands of pieces of debris that posed an immediate threat to the International Space Station. The crew onboard — which included two cosmonauts — had to be woken up early and then sheltered in place as a precaution. Administrator Nelson condemned the test, and he later spoke with Rogozin, “expressing dismay” over the danger the astronauts faced.

Rogozin Indicated to the *New York Times* that he Shared Frustration Over the test.

As it is, the ISS remains one of the few things keeping NASA and Roscosmos together. NASA is currently focused on its new flagship mission called Artemis, a massive new endeavor to send the first woman and the first person of color to the surface of the Moon. As part of that project, NASA developed the Artemis Ac-

cords, an international agreement between various nations that creates a set of standards for how to explore the Moon. Rogozin has been particularly critical of both Artemis and the Artemis Accords, comparing the agreement to “an invasion” in a now-deleted tweet. He also said that Russia plans to work with China on their lunar efforts instead. Despite all this turmoil — both in space and on Earth — the ISS is still zooming along on its orbit, and the astronauts and cosmonauts on board are still working together as planned. In March, Russia plans to launch another crewed Soyuz flight to the ISS, though that mission will carry an all-cosmonaut crew. That isn’t likely to change anytime soon. “I think it’s pretty unlikely we’ll see expansions or new developments with Russia,” says Burbach. “But I don’t think that the nuclear option with ISS — I don’t think we’re going to see that”.

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