

The United States, China, and Space Security: Issues for the Trump Administration

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Victoria Samson: Good afternoon, I think we might as well get started. My name is Victoria Samson, I'm the Washington office director of the Secure World Foundation. For those of us who are unfamiliar with our organization, we're a private operating foundation that focuses on the sustainable use of outer space, looking at it from international cooperative perspectives.

Today's event we're very excited about, because we feel it has been an issue that's been affecting space security, stability, sustainability, every other "-bility" you want to look at, for quite some time, 10 years now.

We wanted to really use this event and put it into a contextual discussion. We all know the details of what happened but where do we go from here? What's happened so far? How has it affected US thinking? How has it affected Chinese thinking? How has it affected international discussions?

No small task. Good luck covering all that you guys. As you know, on January 11th China destroyed one of its aging weather satellites using a ground-based anti-satellite weapon.

There were debates within the United States about the motivation of the test, what it meant for US policy and strategy. One year later, the United States had what it called a satellite shoot down but obviously in my opinion, it was a response to the Chinese test.

The two events [inaudible 1:36] had an international domestic debates over strategic stability deterrents, space weaponization and potential for a space arms race. Many of those issues and questions still remain.

Given the change in the administration, there's probably even more concerns and questions in the air. We'll be having this very good group of panelists to look at the various issues and try and discuss the evolution of space security the environment over the past decade, looking at the relationship between the United States and China.

Then looking at perceptions and intentions on both sides and possibilities. [inaudible 2:09] options for cooperation or improving a relationship at the end. With that, you should all have copies of the speakers' bios. I will skip the actual introductions. We're going to start off with...

Dr. Kevin Pollpeter: OK, great. Thank you, Victoria. I'll be speaking on developments in China's space program. I think for those of us who have been watching China's space program, we have seen immense progress within the past 17 years or so.

What I want to emphasize today is that, for the past 17 years, there has been a gradual process within the PLA, from taking space as something they need to develop as a concept, to actually developing a real war-fighting capability that goes beyond the technology-grabbing headlines that we see in the press.

There's actually also been really interesting progress in terms of doctrine and organization that are at least as important, if not more important, than the technology developments that we've been seeing over the past almost two decades.

There are several data points which serve as markers, along this timeline. The first one, for me at least, one of the most significant markers, was in 2004, where the PLA was ordered by the Communist Party to not only concentrate on defending its interests within its traditional boundaries of air, land, and maritime boundaries, but also looking forward to defending China's interest in space, in far seas, and in cyberspace.

That was in 2004. Fast forward to 2012, and what we see was then President Hu Jintao ordered the PLA to concentrate on three main domains. These domains were not the land and air, but the maritime domain, outer space, and cyberspace. This, to me, was a very significant development. You're getting it from on high that space is one of the three main priorities for the PLA.

Again, fast forward to 2015, where China issued a defense white paper. In this white paper, they elevated space even further. For the first time, the PLA has called space a military domain which must be seized and fought for.

What was also interesting in that paper is that we had a change of the PLA's concept of operations, from local wars under informatized conditions to informatized local wars. We're going to get a little jargon-y here. That may seem OK. You may get lost with it, but the thing to remember here is that actually it was very important.

What informatized local wars mean is that China needs to focus really now on joint operations. It's something that they've been talking about for quite some time, but now it seems that they're really going to take this seriously. They need to form joint organizations. They need to have the technology to be able to connect all those different organizations.

What was also interesting is that they have a new concept of operations embedded with these informatized local wars, and that is system versus system warfare. What the PLA is saying now is that warfare is no longer fought between individual platforms, or groups of platforms.

It is fought between one military system versus another military system. It's very much a holistic look at how to fight war. It's not just bombs on target. It's how do you get that information, how do you process it, and how do you get it out to the war fighter.

What's also interesting to me about this is that we've always focused on asymmetric warfare, while China's developing counterspace weapons because they're weaker than us. If you look at Chinese doctrinal writings, what they're saying now is that system versus system warfare is inherently asymmetric.

The outcome of battle is not only determined by the strength of the respective militaries, but also, they're weaknesses, how easy they are to being exploited, and what happens to that military when those weaknesses are exploited. Asymmetric warfare is definitely just a part of how modern wars are fought.

What's driving this doctrinal change in China's military? In the "Defense White Paper," China has now acknowledged that its main security direction is toward the maritime domain. It is no longer along its boundary -- it's out in the East China Sea, the South China Sea.

In effect, they no longer see Russia as their main threat. They now see the United States as their main threat. What goes along with that is that you then have to be able to prosecute long-range operations over the maritime domain.

Looking again at Chinese writings on naval operations, they have what they call a 'fortress-fleet' mentality, where Chinese ships would stay in close to the Chinese mainland protected by their air defense systems and their air power, and they would fire long-range, anti-ship missiles, long-range, anti-ship ballistic missiles, and anti-ship cruise missiles at an opposing fleet.

Of course, if you need to fire over-the-horizon weapons, then you need some way of detecting those targets, of tracking them, and then, doing a battle damage assessment afterwards.

You can see that there are lots of different technologies that can come into play there. But you could also see where space, the ability to locate a target through remote sensing satellites, the ability to guide a weapon in and using satellite navigation becomes really, really important. In effect, what the PLA has learned is what the US has learned. The farther afield you get from your own home shore, the more important space becomes.

Here's where we get to the technology area. We have seen over the past 17 years tremendous progress in China's technological capabilities. Back in 2000, they had just a handful of satellites in orbit. Now I think they have around nearly 200 satellites in orbit, most of those are remote sensing satellites. Just last month, they launched remote sensing satellites with a resolution of 0.5 meters.

We've seen electro-optical satellites. We've seen Synthetic Aperture Radar satellites that allow them to see at night and inclement weather. They have electronic intelligence satellites to look at the electronic emissions of ships. They have almost every type of remote sensing satellite that you could possibly want.

Looking into the future, what they were saying is by 2020, they want to have a global, all-weather, Earth remote sensing capability. Right now, they say they have an ability to image anywhere on the Earth within a couple of hours.

They want to reduce that, by 2025 to 2030 range, down to 10 minutes. You could see where locating, let's say, a ship moving that's moving on the high seas, how being able to locate the position of that ship every 10 minutes really fits in with what they want to do to prosecute naval warfare.

We're also seeing tremendous technology in satellite navigation. China's BeiDou Satellite System has a regional capability right now, just in the East Asia area. They're going to make this global by 2020. Right now, it's not as accurate as GPS, but by 2020, they want to have an ability to have accuracies down to one meter, so very much competing with the US GPS system.

Of course, they're sending out new communication satellites so that all these far-flung forces can communicate not only between themselves, but also back to headquarters. Of course, systems versus systems warfare is not just about collecting that information and using it. It's also about denying that information to a potential adversary.

Here, we've seen tremendous progress again on counter-space technologies, or at the very least counter-space related technologies. We all know about China's ASAT test of 2007. Since then, China has conducted a number of missile defense tests which have obvious counter-space implications.

They have also conducted, according to the US Defense Department, a couple of more anti-satellite tests. What's really interesting is the test that happened in 2013, where China tested a capability to direct the same capability almost up into geosynchronous orbit to be able to target our GPS and communications satellites.

Really what they're developing here is a broad-spectrum capability to threaten our satellites from low Earth orbit all the way up into higher orbit. We've also seen work on directed energy weapon programs. China has also demonstrated co-orbital capabilities where satellites have rammed into each other.

They've tested satellites with robotic arms that can be used to grapple another satellite, or in the case of what they're testing last year grabbing debris. These have obvious civilian applications. For example, they may have been bumping satellites together to test docking for their space station.

They needed to learn how to hit two objects together in space before they actually sent their Shenzhou space capsule to dock with the Tiangong space station. Obvious civilian applications, but there are counter-space implications to developing those types of technologies.

Finally, we have cyber. In 2012, China was implicated in the attack against the Jet Propulsion Laboratory, where it was said that China had control over JPL networks, then in 2014 with an attack against the National Oceanic and Atmospheric Administration.

We have this technology out there, but in order to really use that technology, you need an organization behind it. This is part of the organizational reform that the PLA is going through right now. In December 31st 2015, China, along with establishing a new Rocket Force, also established what they call the Strategic Support Force.

There's a little bit of a black hole. We don't know a lot about the Strategic Support Force, but I think what we can say is that it's going to be responsible for space, cyber, and electronic warfare, and to supporting, providing these capabilities to a joint command. It's not going to be its own service. It's going to be parceled out in a way that's similar to US military unified commands.

I think the important take away here is that part of this organization took the space mission away from an R&D related organization called the General Armament Department. It has now moved it over to an operational unit called the Strategic Support Force. Which is further indication, I think, that China is gradually going towards a more war fighting footing for its space program.

Now, these have all been evolutionary steps not revolutionary. For those of us in the business, we've sort of been tracking these things. It's not something that would become as a tremendous surprise. I think overall what we see here is that space is now seen as an integral part of PLA military operations.

It's not just something they have to consider, OK, second thought. No, they want to embed it directly into their operations. This has important implications for the US-China relationship and for US security which I think maybe our other three colleagues up here will talk about.

How does the US maintain access to space when facing an adversary that might want to contest our superiority in space? What is the balance between offensive counter-space and defensive counter-space? What role does deterrence play? How do we control escalation in a space war, and what role does diplomacy serve in securing our access to space?

With that, I will hand it off to Brian.

Victoria: Thank you.

Dr. Brian Weeden: That's actually a very good transition. We did not plan that.

[laughter]

Dr. Weeden: Not directly. Good afternoon. My part of this...I'm going to be talking about what the US has been doing in the last several years to reshape and refocus its national space programs largely but not entirely in response to these changes that are going on in China.

I'll start by saying that I think you can make a quantitative assessment that there's been more actual activity and push for change and reform in how the US does national space policy deterrence in the last 5 years and probably in the last 15. I hope to be able to convince you of that over the next 5, 10 minutes.

2010, the Obama administration put out its national space policy. In general, it reiterated a lot of the long standing policy principles and guidance that had been fixed years in US space policy since the Eisenhower administration.

It talked about the need to boost survivability of space capabilities, improve space mission assurance, space situational awareness, detect threats, respond to changes in that environment. Again, all of these are long standing things.

In fact, the Senate Committee in 2001, the Rumsfeld Commission report talked about a lot of the same needs, to protect space capabilities, to better characterize and detect threats, but there had not been a lot of, in my mind, implementation towards addressing some of those challenges since then.

The policy was quickly followed by the 2011 National Security Space Strategy which talked about what we now think of as the three Cs. Space is becoming more contested and congested and competitive. It talked about high level concepts for dealing with that.

Focused around increasing the resilience of US space capabilities, pushing for norms of behavior, and eventually as a part of deterring attacks on US space systems. This was, from what I can tell, the first time that a national security space strategy had been publicly articulated. It was co-signed by the Director of National Intelligence and the Secretary of Defense.

There was buy in from both halves of national space community. Then in 2012, the DOD released a space policy that began implementing some of those high-level things that were talked about in the strategy. This, in my mind, was fairly routine policy statements coming from a presidential level, but mostly developed by the bureaucracy institutions.

There was a sea change somewhere around the fall of 2013 as far as I can tell. It seems to have been spurred by Chinese anti-satellite testing. The test to Geo that Kevin mentioned but also some things that Russia was doing on orbit.

Whatever the actual drivers were, this issue got renewed high-level attention. Some of the inside told me that basically it went to President Obama. His response was, "Fix it. Just deal with it." Which is, for a space issue to get to the president's office, that's a very rare thing.

That led to what became the space strategic portfolio review which has been called the Spear in Pentagonese. Initiated somewhere in the spring of 2014. Concluded somewhere around August 2014.

Although the actual output of it is classified, they talk publicly about it having three main takeaways. Need to better identify threats in space. Need to be able to withstand aggressive counter space programs. Need to be able to counter adversary capabilities.

That led to what was for the space world rather significant budget change. Starting in FY16, budget request over the next five years through FY20, there was reportedly a requested increase between five and eight billion dollars for NASA security space. Most of which was characterized as going towards space protection and space situation awareness.

Although that's roughly a little more than a billion dollars a year in the context of a budget environment where the expectation was stable or decreasing budgets. That was a pretty significant change that the Pentagon leadership, not just the space part of it, but the Pentagon leadership as whole thought space security and national space capabilities was an important thing.

That's an interesting point that it's not just the space who were pushing for this, but the broader Pentagon world.

At around the same time, they created something called the Joint Space Doctrine and Tactics Forum, which was a cooperation between US Strategic Command and the National Reconnaissance Office. The point there was to think about how you would respond to potential attacks on US space systems.

They then created an organization called the Joint Interagency Combined Space Operations Center. JICSpOC was meant to take the thinking done by the tactics forum and actually push out procedures and perhaps even do some operational stuff.

There was the designation of the secretary of the Air Force as the principal DoD space advisor in addition to the existing role as the top executive for all things national security space.

The main change there was the PDSA now has an independent advisory role on national security space in addition to coordinating a consensus position among all those national security space agencies.

Those were all within a period of a year and a half, in my mind, some very significant changes to national security space budgeting and organization that again had been thought about and had been called out as far back as the Rumsfeld Commission report, but there really hadn't really been a lot of action too.

On the programmatic side, there's been renewed push by the DoD to increase the resilience of its national security space systems. The term also used is space mission assurance. They developed a new metric for actually being able to measure the assurance or resilience of the space system which is now being incorporated in acquisitions and planning.

It's not just which system can give us the most communications bandwidth, which system can give us longest lifetime. Another actual metric being evaluated is which system has the most survivability, which system has the most resilience in the face of attack. That's a pretty big shift on the acquisition side of the house.

There's also been a renewed discussion about how the DoD can leverage allied and commercial systems to increase the resilience of its own systems. For example, there's been discussions within the DOD and the European Union on potentially getting access to Galileo and their protected navigation signal that it's going to be provided in the near future as a complement to GPS.

There's efforts going on to talk about broader use of commercial communications satellite capabilities. Perhaps in lieu of future DoD acquisitions programs, such as the follow-on to the WDS system.

There's analysis of the turn offs going on for the future of things like the overhead persistent infrared constellation and the protected strategic satellite communication system. All of which are now trying to take into account the need to be more resilient, to be able to deal with threats.

As I said, a big driver of that change in focus is what's going on in China, and the things that China has been doing that Kevin talked about, but it's not just that. At the same point in time, we've seen a resurgent Russia. We've seen Russia trying to restart some of its own anti-satellite programs. Potentially [inaudible 23:25] those testing, so I think that also factors into the equation.

Specifically, on the China side, the Obama administration has also had some diplomatic efforts to try and engage with China. The first is they spent several years trying to build a space security dialogue with China.

In 2011, there was a joint statement between President Obama and President Hu Jintao on strengthening relations that included a couple of paragraphs on strengthening space relationship between the two.

Space began and be included in the annual security economic dialogue. In 2015, both countries agreed to set up space specific talks outside of the security economic dialogue. That's actually started as two different tracks.

There's a civil space dialogue which started in Beijing in September 2015 and have the second meeting in October of 2016. There are tentative plans for a third meeting in Beijing in 2017. There's also a space security exchange which had its first meeting in May 2016.

Not a lot of public details about the content of these meetings. They've been broadly described as based on exchanging views, exchanging perspectives. In the security side, I'm talking about what things are of interest and what each side, perhaps you may think this could be a red line or not. Although we're not sure of that's a specific part of the discussion.

On the multilateral side, there was the group of government experts report on transparency and confidence-building measures in space. That came out, I believe it was 2013. It was the first time that US, China, and Russia have all agreed on a UN space security resolution.

The caveat is that it was a broad set of these things will be nice to do to improve transparency and confidence-building on space. It didn't really have itself a lot of specific direction of, we shall do this or we will do this.

The question has then become, since the GG report, what specific things can be done to do some of the measures that were outlined in it. Also, since 2010, the UN Committee on Peaceful Uses of Outer Space has had a discussion about the long-term sustainability of space and voluntary best practices to support that.

The committee recently got consensus on the first 12 of these guidelines, which was a fairly big step. We're talking about 70 plus countries all coming to consensus on a fairly broad set of activities. Ranging from mitigating space debris to national policy oversight of private sector, to how we use space for socioeconomic development on the earth.

They're still in discussion over another 25 or so guidelines. I'll say that in that discussion, China has actually been a fairly constructive player to the point of even a couple places breaking with Russia and the traditional group of countries. Brazil, and Russia, and South Africa, and a couple of others that are almost a voting bloc in some cases.

In the context of this debate, both Brazil and China did break with Russia at some point, and supported moving ahead. At a point where Russia was trying to slow the discussion down, and the minds of some actually prevent it going forward.

As I said before, at the start of this, in my mind I think that there has been a lot more activity in the last few years on these issues in the Obama administration that had been, and I would say at least the last couple of administrations.

I think there can be disagreement probably over whether or not these steps are sufficient or whether or not all of them are good measures. At the very least it's probably not controversial to say there's been a lot of effort and a lot of thinking by the administration to try and tackle this issue.

There are several big questions. The biggest one is, "Will the Trump administration continue the momentum?" Particularly on the acquisition side and the reform to the PDSA and acquisition of the resilience reform that is finally starting to get underway after three or four years of trying to turn the ship. It takes that long to implement something in an organization as large as the DoD.

Is the Trump administration going to continue that or are they going to directly get another change? Perhaps to a new strategy away from a strategy of deterrence by denying benefits? The other option might be a strategy of a more aggressive deterrence by threat of retaliation.

If that's the case, that's going to have a pretty big impact on the Pentagon. It's also a question of, "Is the Trump administration going to take a more aggressive stance towards China?" I was just in Beijing last week for a couple of days, and this was a big question that was being discussed.

The sense from the Chinese side was they see disagreements within the Trump administration, the incoming administration, and Congress over Russia. With some saying Russia is a threat, some saying Russia is not a threat.

Their perspective is that they're fairly united in that China is the threat. They're expecting at least a more aggressive stance if not a much more stance towards China.

I will leave it there in terms of summing up the US side of things and look forward to questions.

[background sounds only]

Dr. Gregory Kulacki: Are we good?

Male Participant: Share your notes.

Dr. Kulacki: Don't share my notes.

[laughter]

Dr. Kulacki: Those are just for me. Hey, come on now. Hang on for a second.

Male Participant: Let's try to reopen it.

Dr. Kulacki: Fine. Sorry for the technical glitch. Sorry for the technical glitch here. Oh, come on. All right. How am I going to do this?

Male Participant: Just save from current.

Dr. Kulacki: Here you go.

[laughter]

Dr. Kulacki: Oh, but I can't see my own notes. That's the problem.

[laughter]

Dr. Kulacki: We still have a problem here. Sorry, it was working just fine.

Male Participant: I blame Apple.

Dr. Kulacki: I would too. You can read my notes along with me. How about that? Why is it doing this? Come on, folks. How do I get out of this?

Male Participant: You're locked in now.

Dr. Kulacki: I came in an hour early to make sure this worked.

[background noise only]

Dr. Kulacki: We're good. Good morning, and thank you for coming. Kevin described what China is doing in space and US policy makers often ask why they're doing it? What are China's intentions and how should the US respond? It's hard to address questions of intent without understanding the role of science in modern Chinese history.

By using language that has its origins in the Chinese reform movements of the early 20th century, Chinese president Xi Jipeng recently tied China's success in space to a renaissance of Chinese culture and civilization. The idea of a renaissance implies something lost and in China's case, it was the loss of self-respect and the loss of the respect of others for Chinese culture and civilization.

This occurred because China lost control of its own territory and its ability to govern itself. Young Chinese reformers and revolutionaries sought to recover both and fought among themselves about the best way to do it.

They disagreed about so many things that Chinese revolutionary leader Sun Yat-sen, pictured here, derivatively described the Chinese body politic as a loose sheet of sand, but they all agree that China fell victim to the predations of other nations because China failed to develop modern science and technology.

The Imperial Chinese government focused on acquiring military technology, especially a Navy, but a generation of effort to graft western military technology onto China's existing economic, political, and social culture failed to prevent a disastrous defeat in the in the Sino-Japanese war of 1894-'95.

In the wake of that defeat, young, educated Chinese accelerated a great national effort to study the western culture that created modern science. Within a generation, a new youth promoted a new culture organized around science and around competing Chinese interpretations of western social science.

The Chinese Communist Party won this social science competition and was able to re-unify the country and reassert China's ability to govern itself. China's new leaders determined that keeping pace in advanced science and technology would be essential to preserving Chinese self-determination. They encouraged Chinese scientists abroad to return home and hundreds responded.

These two men were especially consequential. Deng Jiaxian, on the left, obtained a doctorate in nuclear physics from Neil Armstrong's alma mater, Purdue. Qian Xuesen, on the right, directed the US jet propulsion laboratory. He's pictured here in Germany, where the US army sent him to debrief German rocket scientist Wernher von Braun.

The emphasis on science did not prevent Chairman Mao from pushing manifestly unscientific agricultural policies that contributed to one of the worst famines in human history. Mao's misguided Great Leap forward was animated in part by US and Soviet satellite launches. The poster on the left reads, "Agricultural Great Leap Forward, communes everywhere launch satellites."

The scientist on the right, Zhao Jiuzhang, led China's actual satellite program. He was hounded to death by red guards during the Cultural Revolution, another Mao-inspired mass movement that persecuted intellectuals and shut down Chinese higher education for a decade, crippling China's scientific and technological development.

Despite the chaos created by these two mass movements, the nuclear weapons and missile programs run by the military, succeeded in meeting their objectives on time. The satellite program run by the Chinese Academy of Science suffered repeated delays. China's first satellite, launched in 1974, could only play a Maoist tune.

It would be another decade before China put its first functioning communication satellite in orbit. These accomplishments are remembered now by the four-character Chinese phrase, [Chinese] . That Chinese scientists were able to succeed despite the trials of the times is celebrated now with great reverence.

Chairman Xi Jinping, seen here at the cemetery where many of the scientists are buried, is fond of reminding China's scientists to carry out their work with the same spirit of dedication and sacrifice. Some US observers view Xi's frequent invocation of the [Chinese] spirit, especially when speaking about space, as an ominous indicator of aggressive intent.

Another plausible interpretation is that Xi invokes it to educate and inspire Chinese scientists. The current generation of Chinese scientists, like the [Chinese] generation, was enabled by exchanges with the United States including US government efforts to help China develop carrier rockets to launch US satellites.

Indeed, the broad-based scientific aid provided to China during the 1980s allowed China to bridge a critical gap created by the collapse of higher education during the Cultural Revolution.

Despite generally good relations with the United States during this period, China launched a new program to accelerate the development of defense science and technology, the 863 Program,

named for the year and month four senior scientists from the [Chinese] era sent a report to China's leaders on the necessity of responding to President Reagan's Strategic Defense Initiative.

As the decade turned, the combination of the collapse of the Soviet Union and the Tiananmen Massacre undermined US support for scientific cooperation with China. Lack of support gradually transformed into a fear of cooperation as the idea of China as a threat began to take hold in US public discourse.

The graph depicts the increase in the appearance of the term "China threat" in English language publications. The US Congress responded by enacting progressively restrictive policies limiting cooperation with Chinese scientists, especially those working on space. These restrictions did not inhibit China's scientific development. China's space program progressed rapidly.

One of the most important consequences of these developments is that for the first time since the Opium Wars, China is not dependent on the goodwill of western nations for continued scientific progress. The US political establishment seems to be having a hard time adjusting to China's hard won scientific independence and that's understandable.

It's unprecedented and it's redefining the balance of power in US-China cultural relations. China's emergence from a century and a half of scientific dependence is also coming at the same moment Chinese elites are losing respect for the United States. Recent events, especially the 2008 financial crisis, have undermined Chinese faith in US stewardship of global affairs.

As US policy makers consider the question of Chinese intentions, it's important for them to keep in mind that the Chinese people are now well on their way to recovering the self-respect they lost 150 years ago. The attitudes and behavior of the current government reflects this and can be interpreted as expressions of an expectation of respect from others.

It should be possible for US policy makers to acknowledge these expectations without harming themselves or their allies. I think space science and exploration is one possible vehicle for safe and constructive engagement. Thank you, and I look forward to your questions.

Victoria: Thank you. Dean?

Dean Cheng: Good afternoon. It's always fun to speak right after lunch, it's especially fun to be the last speaker after lunch. My comments were supposed to be along the lines of, "So, what will Mr. Trump do?" My answer is, I have no idea and neither probably does anybody else, so thank you all very much for coming.

[laughter]

Dean: No, sadly I'm going to speak for a few more minutes. I suspect however that one of the ways to think about where Mr. Trump is going to go in terms of US-China relations and US-China space relations actually are parallel to what Henry Kissinger once said.

Dr. K basically said, "We are not going to make the mistakes of the previous administration. We are going to make our own new mistakes."

[laughter]

Dean: I think that it is safe to say that the Trump administration is likely to make its own mistakes, but we can see from both current declared policies of Trump nominees and also, some of China's actions, basically where things are likely to head.

Let me begin with some brief comments about where the Chinese already are building off of Kevin's excellent presentation. The first is that there is significant strategic attention to space -- not just in the military context although that's obviously true -- but when we take a look at a number of Chinese documents, we see space emphasized.

For example, the National Defense Law of 2015 included clauses on space and networks security. Evolving science and military strategy in 2013, a PLA textbook had a chapter devoted to space and other new domains. A number of other Chinese laws and things also discuss aspects of space. This brings us to the most recent space white paper.

Included in this official document which comes out about every five years, that's no accident because it seems to be key to the five-year plan. One of the things to keep in mind is that the Chinese are still in some ways very Marxist-Leninist. One of those aspects is that they do things by five-year plans. It's a good, useful marker of where things are.

In this new white paper, they said essentially, in the ongoing five-year plan that will reach up to 2020, we expect to have new launch vehicles. We expect to undertake several deep space probes including a lunar lander on the far side of the moon.

Greg was talking about Chinese self-respect, about Chinese accomplishments and this is an excellent example of a significant Chinese accomplishment. Landing a probe on the far side of the moon, a place that nobody else has gone. We've orbited the moon, but nobody has actually landed there because the Transformers have their base on the other side.

[laughter]

Dean: One thing is to keep in mind is if you're going to land on the far side of the moon, how are you going to talk to it? The answer is -- as the Chinese have noted -- they're going to put a communications/data relay satellite at the Lagrange point L2.

That's a rather significant achievement which interestingly is underplayed on our side, I'm not sure why, I think maybe we're not paying enough attention - but underplayed on the Chinese side. When you start putting things into L2, what are you doing? You're going beyond the geosynchronous belt.

You're significantly expanding the volume of space that you have to monitor if you're going to try and keep track of other people's assets. You have the potential ability to deploy satellites in operational reserve to replace things that are destroyed or at a minimum, you have an additional target that's a heck of a lot farther out in terms of targeting for jamming or physical destruction.

If you want to be really obnoxious, you can always bring it back in, whether at a slow, controlled pace to replace something in geo or a really fast controlled speed to perhaps have a conjunction with something in geo. The Chinese implication here is that they have this efficient SSA themselves to track their own satellite all the way out there at L2.

That's assuming that it's only one. I'm not sure why you would assume that there will only be one. The other interesting thing about this space white paper is that it explicitly associates space with strategic terrestrial goals. Nothing so worrisome as defense, that would be unsporting.

They mention national security. [inaudible 46:10] of the PLA, Japan has no role whatsoever in China's space program, at least according to the space white paper, but they do note that there are strategic terrestrial objectives that the China Space Program will support including the One Belt, One Road project. They explicitly tie [inaudible 46:26] to One Belt, One Road.

When you think about how pipelines, for example, pumping stations, coordinate their pumping activities, often right now with GPS signals, you can start seeing a link between both infrastructure development and roles but also commercial.

Therefore, political links between the various countries that you're investing billions and billions of dollars in, and billions is where we may be at in this case, and China's political interest in tying these countries and their technological development.

Where is China going to go in space between now and 2020? Again, the honest answer I have to say is, I have no idea. Here are some things to pay attention to. The first is the 19th Party Congress later this year. The Chinese also operate on a periodic party congress representing what we sometimes term as generational cohorts of leadership.

Xi Jinping, we assume is going to continue the general tradition of having two terms as Hu Jintao did. But unlike his two predecessors, he doesn't get to bring his entire leadership cohort with him. Under communist party rules, they are supposed to step down this year because they've hit retirement age. You are going to see an entire group of leaders other than Xi Jinping and [inaudible 47:55] step down.

Some people think [inaudible 47:57] may stay. For those who are curious who he is, I'm happy to talk offline. Basically, he's the guy who's been enforcing the anti-corruption rules, so he is very closely tied to Xi. Of the Politburo Standing Committee, seven members. That still leaves four members to be determined. This raises some interesting questions.

Who is likely to step up? Will it be older people who have to step down in 2022, which means that any reform you try to implement between now and 2022 basically has maybe four years to be implemented in a system that basically moves glacially? Or are you going to younger people who could overlap into the next party leadership cohort?

That would mean the Xi Jinping is being given the opportunity to influence the next leadership cohort. That is an extreme amount of power, not something you would give up very lightly. The other piece that goes to this and again building off of Kevin's earlier comments about reforms is, who will be on the new central military commission?

Who will be head of the five new war zones? Of course, we will have the various services included, [inaudible 49:02]. This will all have clear implications for space. There is no expectation of political reform, at least I hope not because those hopes should have been circuited after 2012, when everybody thought Xi Jinping was going to be a political reformer.

Instead, like Anakin Skywalker, who was supposed to bring balance to the force, he brought political reform. It's called a crackdown. We may see economic reform or we may not. If we don't see economic reform in the coming five years, that would mean 20 years -- because Hu Jintao was definitely not interested in economic reform either -- 20 years of status quo, fairly tepid at best, efforts at slightly modifying a fairly deadening hand.

That in turn will affect resources eventually available downstream post 2022, including space. This brings us to Mr. Trump. Mr. Trump has already said that he wants to increase resources for defense. He's talked about a 370-ship Navy. The current navy building budget is about 280. It won't be all in one giant swoop.

You are talking about a significant increase in defense spending simply for the Navy. What we'd expect is that this [inaudible 50:22] will be shared beyond the sailors and the fact that Deputy Secretary of Defense Work has been asked to stay on, the man who is probably most responsible for the concept of a third offset, suggested that there will in fact be a degree of continuity.

Similarly, General Mattis, with all the controversy about whether he's been out long enough and having to have a special law pass so he could become secretary of defense, is quite familiar with what is going on in defense. One could look at this as another example of continuity.

Is Mr. Trump likely to be Ronald Reagan to China the way Reagan was to the Soviet Union? Maybe. He certainly has a fairly negative view of China, at least as publicly discussed. On the other hand, as the old Vulcan saying went, "Only Nixon can go to China."

Perhaps Mr. Trump, who is something of a master negotiator, might be taking a very negative position in order to enhance his negotiating position with the Chinese.

Frankly, it is much too early to tell, but I think what is useful to know here is that with the 19th party congress, and the new Politburo Standing Committee, if we assume as has been true since 1999 that the Chinese foreign minister will not be a member of the Politburo.

Meaning, will not be a key member of the decision-making process, that's basically a glorified mailman. Then in that case you could ironically have after the party congress an American Foreign and Security Policy Leadership Team that is actually more experienced somewhat, than their Chinese counterparts.

That they will be people who have worked together, worked out some of the kinks and all that sort of stuff, in the intervening 11 months or so, while Mr. Dazhe's new team, who, it should be emphasized, are not going to be neophytes, are not going to be brand new, fresh out of the Central Party, school of people. These are going to be people who have been around for a long time as well.

But they are not going to be oriented towards foreign policy, and the new military leadership will also be very new to their positions. That they are still going to have a breaking-in period. All of which, basically, to conclude, means that, ironically enough, one of the favorite Chinese phrases of the last 15 years or so has been that China is currently in a period of strategic opportunity.

In fact, from about April or May of this year, when China basically goes heads down, in terms of being very internally focused, it may be the United States that actually has a period of strategic opportunity with regards to China.

That it will be in a position to perhaps throw a lot of initiatives out there, put the Chinese on their back foot, and as important throughout the rest of Asia, which has experienced Chinese increasing aggression in the South China Sea, across the Taiwan Straits, around the Senkaku. It may well be that the Chinese are going to find themselves basically at the receiving end of that period of strategic opportunity. Thank you very much.

Victoria: OK, great. That gives us a lot of time for questions. I'm going to start off the first one, and then after that, I'll come out to the audience. One of the things I was very interested to read is that China, I think, recently launched one of their first commercial satellites.

I'm wondering how that changes things between the US and China, if China actually develops a strong commercial industry? It's open to anyone on the panel wants to speak on this.

Dr. Weeden: I'll just start by saying, the last few years when I've engaged with Chinese on space, commercial space has been a big issue for them.

They're well aware that we the US have recently put a big emphasis on commercial space, and are leveraging innovation to boost national power prestige. I think they're very keen trying to do the same.

There has been in effort within China to promote its own commercial space sector. At the big International Astronautical Congress last year in Guadalajara, there were two interesting companies, one called Launch Space that had advertising a small satellite launch vehicle, and the other one who's advertising basically small satellite constellations.

You couldn't tell right off the bat that they were actually Chinese companies, and it was very clear that they were there to market themselves as, "We are offering launch services. We are offering satellite zone services," and that was clear was a very big emphasis they had. Second point here, I took part in a process to write a chapter in a book about US and China Relations.

I wrote about space with a Chinese co-author and he was very insistent that we talk about relaxing export controls and allowing Chinese companies access to the global space market.

Again, that was another big part of their push to try and get more commercial. Now, is it really commercial I think is the big question. There's obviously a lot of people in the US that are not quite sure whether or not there's Chinese commercial activity the same commercial way that we Americans view commercial activity.

I agree that it may not be the same. I'll just point out that most other countries in the world don't view commercial activity in space the same way we do. Most of them have a fairly greater degree of government participation in that than we do where the US in some cases tries to have what is a purely private sector.

Victoria: Anything else?

Male Participant: Yeah, I just also caution what Brian said there at the end is that some of these companies are not actually what we would consider private companies.

The majority stake holders, in fact maybe all the stake holders are actually government owned. I think there is one company that's actually called a private company that is actually majority owned by the Chinese space industry.

The extent to which they are actually private, the extent to which they can actually bring the dynamism of private enterprise to the space industry remains to be seen. I would think that China would still want to concentrate to its state-owned enterprises, but we'll have to wait a few years to see what shakes out.

Male Participant: I would only add that, it's not something I've looked at, but my expectation would be the market would be the newly developing countries for any Chinese commercial space activity.

Male Participant: To build off of that, it's useful perhaps to note that China has, of course, sold satellites and associated launch services already via the China Great Wall Industries Corporation which is a wholly owned subsidiary for China Aerospace Lands and Technology Corporation which is a state-owned enterprise.

One of the interesting things here to consider is somebody like Huawei or ZTE. These are not state-owned enterprises. However, if you have a Huawei phone or a Lenovo computer and you want to keep something private and out of Chinese hands, I leave it to your imagination as to how reliably it will do so, if you decided to put something on that hard drive and then hook to the Internet.

I would suggest that a private Chinese company, a genuine private company, not a state-owned enterprise or a subsidiary, that was doing space launch/satellite manufacturing, what else is embedded in the code? What other software routines might be running in the Chinese built tracking telemetry and control or mission control or ground control facilities. Might there be backdoors? Here I will just note, not directly related to space.

A German cyber security company bought a Chinese manufactured phone, opened it up, took it out of the wrapper and when it turned on, immediately pinged back to servers in China. Might a brand new fresh out of the wrapper satellite perhaps ping a Chinese location along the way? Who knows?

Victoria: I open up to questions in the audience. Wait for the microphone and then identify yourself, please.

Mick Leeson: I'm Mick Leeson, [inaudible 59:07] support to SAIC for [inaudible 59:09] assessment. Brian, you talked about the changes in the US programs budget, organizational structure and so forth, and I'm just wondering what the perception is in China. I haven't heard much about that.

Dr. Weeden: To be honest, I haven't heard anything in the last year and a half that was directly talking about that. I think part of it is that there's so much jargon and complexity.

Even those of us that follow what the US government does, having trouble dissecting what PDSA is versus the spear and that kind of stuff and who knows what the [inaudible 59:46] box's doing, that's still an evolving entity. Honestly the one thing that I still...when they do bring it up is X37B.

That is still a topic of contention outside the US as to what it's really doing or what it's real mission is. I think in general, I don't think it's seen as a major change in that...It's interesting hearing about Kevin talk about their doctrine, shifts and how their approach to organization is.

We discovered joint space organizations and joint space operations a long time ago. We discovered space doctrine and coordinated combined armed stuff quite a while ago. I don't think they see it as anything different.

I think they're very concerned about missile defense and the rumors about potential space based missile defense and brilliant pebbles being made great again and coming back around. I think that's a real concern for them is that, that connection between space and missile defense and not necessarily space itself.

Male Participant: I just want to express a word of disagreement out of space based missile defense thing because I think the Chinese would love for the United States to waste a fortune on that system. I don't think that there's as much anxiety in the past in China about security of their nuclear forces or missile defense today. That's my own personal assessment of the state of affairs at the moment.

Male Participant: I think for some time the Chinese has viewed the US as preparing for space war. You look at some of their earliest writings on the US's space program, you see them referring to our 1985 test where we destroyed one of our satellites in space, the 1997 MIRACL laser test, other types of tests that could have counter space implications, our development of missile defenses.

They view that we are preparing for space war, developing capabilities to conduct space war. Things like developing or establishing new organizations, for the Chinese only reinforces that, and you see where they talk about where the US is intensifying their efforts at space war. This is for them further proof that they need to develop their own space warfare capabilities because they view the US as doing the same.

Victoria: Let me just build on that. What is the perception in China of how the actions are being viewed? Because just from sitting in Washington, a lot of people who argue for a more aggressive posture point specifically at what the Chinese are doing as justification for that.

Do the Chinese acknowledge, OK, there's some consequence to us taking this more aggressive posture, or do they see it as independent, like what they're doing shouldn't have any effect on what we're thinking?

Male Participant: I don't see any contemplation of how their actions affect the US. I think we aren't in a security dilemma. We're just on the verge of it, and I don't see a way out of it, frankly. Regardless of who started what, when, how...

Victoria: [laughs]

Male Participant: ...we're into this cycle now of reaction, and then counter reaction. I don't see a lot of thinking on the Chinese side about what their implications of those actions. For example, they seem to be heavily investing in direct ascent technologies. How does that affect the space environment, if they were to use them in the long term?

Other questions, such as, as they become more heavily invested in space, does it really benefit them to start a war in space. By adopting some of the same types of operations or conducting operations in the same way the US military does, they take on those same vulnerabilities.

I don't see that sort of discussion happening. What I do see happening is these discussions about we have to have some capability, direct ascent seems to be the easiest one to make, so that's what we need to invest in now. If the balloon goes up tomorrow, we need to go to the president of China and say we have these capabilities.

What I'm concerned about is that there isn't this thinking about the broader implications of developing space weapons that we would hope.

[crosstalk]

Male Participant: Just a rhetorical question, if they don't, to paraphrase it, business as usual in their perception toward what the US has been doing for the last 30 years, does that somehow undermine our thought in US circles that by doing this it's helping with deterrence? If it's [inaudible 65:09] that are we really straining deterrence by doing this?

Male Participant: I think if we looked at how the Chinese characterize the South China Sea, it provides us with a little bit of insight as to how the Chinese characterize a lot of other things.

When we look at how the Chinese describe what is happening in the South China Sea, it is that China has always controlled everything within the Nine Dash Line, that foreign countries are now trying to cut away pieces of that.

The Permanent Court of Arbitration was a bunch of people who didn't understand international law -- this is the International Tribunal at the Hague -- and above all, that the United States is responsible for fermenting the Philippine court action, Vietnamese resistance, etc.

This was said by General Feng Fenghui when he visited the US and held a joint press conference with then Chairman of the Joint Chiefs, previous Chairman, Army Commander. We've heard this from Madam Fu Ying at the National People's Congress, etc.

The reason why I bring this up is because, one, obviously, there are multiple ways of interpreting things. But building off of Greg's presentation of China's experience, what they've often termed the Century of Humiliation, is that you want to wind up with something of a bit of a chip on your shoulder, and understandable, which is basically, we have been the victim, and we won't be victimized again.

Now how does that affect deterrence, which I think is a very interesting question? One of the things that, again taking a look at recent history, in 1995 in the most recent Taiwan crisis, the US

dispatched aircraft carriers as a response. The general account seems to be that the first aircraft carrier was what we always use -- business as usual, and the Chinese sort of said, "Yeah, check the box, got it."

It was the second carrier that really made the Chinese sit up and take notice because that wasn't part of what we do. Insofar as what we are doing, especially as an organizational bit of hamster wheeling, is what we always do. I suspect that Beijing looks at that and says, "Yep, that's what they always do." The question is going to be, does the US do something out of the ordinary.

Now, whatever you may think of Mr. Trump, and whatever you may think of Mr. Trump's comments on how does China relates to things, one thing you can't deny is that it has grabbed China's attention. I'm not here to make a value judgment of whether that's a good or bad thing.

My point is simply to say that Beijing has been essentially put on notice. Even if he never mentions Taiwan ever again for the next four years, that business as usual probably doesn't apply. If nothing else, it does tend to force the Chinese to start rethinking all of their branches and sequels of all their contingency plans.

Victoria: OK. Then Gregory.

Male Participant: I'll just add on to that, I think for us to think about deterring them from developing counter space weapons, that ship has sailed, it's no longer an option. Then we get down to can we deter them from using certain types of counter space weapons. Here I have some concerns.

If you look at Chinese writings on deterrents and escalation, what you see is that there is sort of an implicit understanding that they hold the cards in terms of escalation control and going up the escalation ladder.

If they feel that they can go strong enough, especially at the beginning of a crisis or an operation, that the other side will immediately back down. My concern is that China may see that they can do certain actions in space and in essence get away with it because they think that we'll just say, "Well, Taiwan, South China Sea isn't as important to the US. It is a China cell."

They'll do a cost benefit analysis, think rationally and leave with their tail between their legs. My concern is that what we don't see, in Chinese writings on deterrents and escalation, is the second order analysis about what happens if the US doesn't back down.

Let's say China destroys a satellite in space, they're thinking, no, we'll just give it up and go home. What if we don't do that? What happens if it initiates a reaction or even stronger reaction? I don't see that calculation in Chinese ranks.

Maybe it's happened somewhere, in some deep, dark recesses in Beijing but it's certainly not being discussed publicly, and that's also what has me concerned, that they aren't thinking about this second order questions, just generally in regards to space war.

Male Participant: Very quickly to add onto that, I agree with the general assessment that I don't think we can deter them from pursuing counter space capabilities. I say this that ship has sailed. I think we might be able to deter them from using it but I'm not entirely certain of that.

That then raises the question, "OK, well, then, what do you do when deterrence fails?" To me, that is another vote in favor of the deterrent by denying benefits approach versus the deterrence by aggression approach.

If my deterrence is based on threatening you with reprisal and it fails, I have no choice but basically to back down or to attack and by the way, I've probably lost my asset to begin with.

Whereas if you do a deterrence by denying benefit, that's based on resilience, and you truly did check that resilience box and deterrence fails, then your capabilities probably will degrade gracefully, if not be resistant to it, which then leaves the US in a better position, should it start being an escalative conflict event rather than deterrence failed, and by the way, oh yeah, we just lost these key, space capabilities.

To me, that question of what do we do when deterrence fails, in my mind is a vote in favor of the current approach of deterrence by denying benefits rather than deterrence by threatening response.

Victoria: Gregory, do you have one more thing?

Male Participant: Yeah. My own sense, I agree with Kevin that the United States is the principle adversary of which all planning and procurement takes place.

I don't think China's spoiling for a war. I think its focus is primarily domestic and it just wants to avoid trouble internationally, but there are red lines. Taiwan would undermine the legitimacy of the struggle if the Chinese Communist Party won. If they lose Taiwan, they lose political legitimacy.

It's still a domestic matter for them. That's a line we can't cross. South China is a little more iffy. Maybe they're doing the same thing Trump's doing, staking out a position and hoping to get some good negotiations on the outcome of eventual southern disputes. I don't know. I can't say with any authority.

In terms of space, I don't think China is planning for any specific, space war scenario. I don't see it. They're just developing generic set of capabilities, a robust, comprehensive, generic set of space capabilities, and they may be thinking operationally about to use them.

Kevin's talked about to integrating that into the way they're reorganizing their military. I don't think that they're planning or imagining some war with the United States and how it's going to proceed from step one, to step two, to step three. I don't see that.

Of course, you wouldn't see that, anywhere. It's not something that they discuss publicly. I don't get the sense that they think there's a very large possibility of a war with the United States, anytime in the immediate future.

Victoria: [inaudible 73:35].

Male Participant: Greg's comment is very interesting, because on the one hand, I actually agree with a key standing point, which is I don't think the Chinese are looking for a fight.

As I said earlier, the Chinese often use a phrase, "pure to strategic opportunity," which is inevitably followed by "for continued peaceful development of the Chinese economy to allow it to reach mid-level development status."

I don't think anyone at this table is saying the Chinese, they're just...there is a Chinese Nagumo just ready to sail with the Liaoning and bomb Pearl Harbor.

Male Participant: [inaudible 74:11] thinks so.

[laughter]

Male Participant: I don't know if even he would if you were to put him on the spot. That's a separate issue.

Male Participant: I've read his books.

[laughter]

Male Participant: The interesting thing that you said is, you don't see the Chinese really planning for a conflict, with the US, involving space. You said now you wouldn't expect to see it, I think which we also agree. You just don't think you see it in any case.

My question is what to you would be a marker? Short of the Chinese issuing War Plan 7750, which is basically war with the United States, and here it is and in H plus two minutes we start taking down satellites. What would you say would be a marker that the Chinese are thinking about, beyond just a generic, yeah, I want to be able to plank a couple of sats, serious, no kidding, space war fight?

Male Participant: That's a great question, Dean, and honestly, I don't have an answer.

Male Participant: What if the Chinese start a version of the Schreiver Wargame of their own? That's the part of the purpose of Schreiver, which is to think through what a future conflict might look like, to inform acquisitions and doctrine.

Although, honestly, I think that actually might be, in some ways, have a positive implications because I've asked that question to Kevin, in other words have they seen evidence of this? You talk to the DOD people that participated in Schreiver and they say, "Well, we learned that this escalates stuff really bad, really fast," or this particular move does this.

I ask the question, "OK, has China learned that? Has Washington learned that?" Because if not that's a challenge in my mind. That, I think, would be, in my mind, one data point that we're sure they might be considering it.

Victoria: Gregory.

Male Participant: One way to answer that question would be to talk to them.

[laughter]

Victoria: What?

Male Participant: We don't and we should, more systematically, more often. We have to create the conditions for that to happen.

The kind of dialogue we have in the United States right now about China and space, it's very hard to create those conditions. It's hard to get people to want to come to the table, especially the military folks who don't feel comfortable in international settings and for a variety of different reasons, aren't willing to speak openly about what they actually think.

Male Participant: Theresa.

Victoria: I think we had Theresa.

Theresa Hitchens: Is this on?

Male Participant: Mm-hmm.

Theresa: Hi, I think you all know me. I'm Theresa Hitchens with the University of Maryland, Center for International Security Studies. I want to follow up on this conversation because it hit on a number of things that I've been thinking about.

There's two basic points. One, the point about escalating to deescalating and that seems to be a Chinese way of thinking, at least it's what I'm hearing. It also, more recently, seems to be playing into Russian thinking, which is scary as well.

I've been hearing and I've been reading little snippets saying that China is even considering attacking US early warning satellites and I have not been able to track that back to anything specific. These are generic, one-line in various reports.

I would like to know if anyone actually has evidence of that kind of thinking that they could site. That's the first thing.

My second thought process on this is one of the things you all mentioned is that China's actually looking to use space in the same way that the United States is using space now, essentially, because they have interests in maritime operations and now operations outside of their land borders.

If that is the case, and if they're going to be, over the next 10 to 15 years, more vulnerable, in more vulnerable situations, more dependent on space assets, do we not possibly, at this point in time, when they're getting a new government, when they are going into [inaudible 78:20], in the US, to come up with ways to have these discussions about the second order consequences, about escalation, about their potential [inaudible 78:33], about how to get ahead of this negative action-reaction cycle that has already started.

That's the two parts of the question. Thanks.

Victoria: Pat.

[crosstalk]

Male Participant: The Chinese write a lot about attacking all sorts of different satellites so it's really hard to tell about what they may have as a priority. My concern is that with, if they do target ballistic missile, or early warning satellites is that are they...For us, that increases our sensitivity because you may be attacking part of our nuclear infrastructure.

From their side, this is a conventional capability because we would be using it to track Chinese ballistic missiles, conventional ballistic missiles, against Taiwan or against our naval assets. They don't necessarily think that we have those same equities.

Again, escalation, another point to be concerned about, escalation. In regards to timing of discussions I would say if we aren't having those discussions we don't need to wait for the next set of leaders to get into to take power in China because the leadership may change but there's still going to be a whole bureaucracy there that doesn't change.

There's going to be a lot more continuity in the Chinese government than in the US government when administrations change. Those discussions can happen at any time. I would say that it necessarily has to wait for any change in leadership.

Female Participant: You think they should have, is what I'm asking?

Male Participant: I would think that having those discussions about second order affects would be tremendously helpful.

Male Participant: As I mentioned, the Obama administration has started a space security exchange in the spring of 2016. I said we don't know if that was discussed but I would hope that one of the topics would be something along these lines.

However, I do know that within the US government there is an internal discussion about do we talk about red lines. Do we set red lines and the pros and cons of that?

I honestly don't even know if the US government has gotten its own act together with that its red lines would be or what its position would be. I would hope that would be a venue where this bilateral discussion might happen.

That said, I am reluctant to say, look...I'm a big believer in that experience being the best teacher and I honestly don't think that China would truly understand the US concerns with this until they have gone through their war games and their own exercises and have their own understanding of this is what would happen. This is what might be a challenge.

To be honest, that's one of reasons why we at Secure World, last year, in the fall, we held a tail tailored exercise to look at some of these challenges with crisis and escalation involving space in a way they can be discussed outside of the purely classified environment of [inaudible 82:07] .

Victoria: I'm sorry.

Male Participant: You mentioned the Russians. I think it's very, very important here to distinguish between at least what we think the Russians mean by escalate-to-deescalate, and what the Chinese seem to mean when they talk about a concept that doesn't actually translate directly as escalate-to-deescalate.

The Russians use that term very specifically and for a very specific circumstance, which is to go to nuclear escalation in order to persuade your adversary to back down. Going to mass firings of Iskander missiles with conventional warheads is not escalate-and-deescalate. That's simply preparatory artillery barrage. Going nuclear is what matters.

The Chinese are very different. They don't seem to actually talk much about going nuclear. In fact, make very clear that going nuclear is an extraordinary situation that is its own separate strategic set of concepts. Their escalate-to-deescalate is to go high in terms of violence, use of force, intensity, etc., but still maintain in a conventional context.

Here, firing a massive barrage of conventional missiles could be seen as escalating-to-deescalate. I do think it's very important that we recognize its very, very fundamental difference. With regards to use of satellites, like Kevin, I think, we have seen references here to the reality that we have used our missile early warning systems to cue missile defenses.

If you're the Chinese and you have invested billions and billions of Renminbi in developing your missile force as one of your key means of touching someone, anything that defends against that is going to be part of your kill chain you have to frustrate and defeat.

That it also ties into the nuclear aspect could be actually seen as an interesting second-order deterrent effect, which is to say, "Do you really want to continue this because you're going to lose a lot of capabilities?"

I'm not suggesting that they're going to do that. I'm not sure that we have seen them explicitly make that trade-off, but I would suggest that some writing seem to imply that or it could just be that we're inferring.

Finally, with regards to the PRC becoming more like the United States, I'm going to disagree with my respected colleagues up here. I don't think that's actually true. There are certain Laws of Physics that say that if you want to communicate with somebody on the other side of the planet you pretty much have to do it from space. Fair enough.

First off, strategically speaking, China is focused on the near-end battle. Now, they are looking at the far seas, but defending the near-end, say, within the first island chain.

What are we talking about? We are talking about a zone that is covered by Chinese fishing boats, Chinese aircraft, Chinese UAVs, Chinese UUVs, over-the-horizon backscatter radars, aerostats, communications. You can do landside, you can do radio, you can do laser, you can do microwave.

I don't need space. But somehow, they are going to imitate us because Beijing really is Washington, DC. There's that white tower, it's really like the Washington monument. Obviously, I'm being somewhat sarcastic.

The point is, we somehow insist that China is going to go just like us and therefore they will have the same vulnerabilities. I would suggest if nothing else, a country that develops behind the United States, meaning temporally-speaking, is going to see us make some mistakes and probably not do the same thing.

Now as Dr. Kissinger said, they will make their own mistakes. To assume that if they will wind up in the same...No, if China winds up wanting to operate a Chinese version of the sixth fleet in the Med and the fifth fleet in the Arabian Sea, yes, they're going to need satellites probably. Or maybe they're not planning on doing or fighting quite that far away.

I really want to caution against what we often hear from people, which is, they're going to look like us, so let's talk to them immediately and that goes on to my slide.

No, I'm actually not so sure we need to talk them, partly because of what Brian said. I think you can talk to your kid about the lessons they should learn from life, but most of the times, they're going to say, "Yes, sure mom. I don't see the problem with going to that party on Saturday night. I don't care about that outfit."

The other point here is also who are we talking to? As I said earlier, the foreign minister isn't part of the decision-making process. We are going to meet with the PLA. Who from the PLA? Who are they?

Are they their strategic leaders? Are they their technocrats? Or are they their barbarian hammers whose job is to influence us and report back to in a safely contained channel because we don't want them influencing the larger PLA.

You have an entire political department, which survived the Reform. This is a Party army and the political officers, which represent a massive chunk of the PLA, are there partly to ensure political orthodoxy.

Unless you think you're going to persuade these fine upstanding Marxist-Leninist-trained PLA officers who are also trained in psychological warfare, and are charged with political warfare, into somehow adopting our American political science concepts of the security dilemma, who are we talking to and why do we think it'll make a difference?

Now, maybe it will make a difference eventually someday, but I'd like to see us develop a little better understanding of them before we try to sit down with what somebody from the PLA.

Male Participant: First of all, the Chinese aren't children. They are equals. You go through the door that's open and if the only door that's open happens to be the foreign office people then that's where you start, and you work your way up.

From the point of view of our organization, that's the place to reach into this particular part of the Chinese defense and science technology community. It's a scientific community. I work for the union of [inaudible 88:59] scientists.

If you have cooperative projects and civil space, there's another door. You can't get to know people if you don't talk to them. You can't get to know them first and talk to them later. Human relationships, including relationships between countries, don't work that way.

We're so far behind because of the Congressional restrictions and the lack of contact with Chinese scientists that we have a long to go, which is why we should start as soon as we can.

One other comment on a related issue about escalation and scenarios. China, at least as far as I'm concerned, in its strategic writings or military writings, use any missile strike, not just nuclear strikes, any missile strike as a strategic attack. It uses that language.

I'm not really sure what it means other than it's something very important, not to be done lightly. The use of a Chinese conventional missile against anything would be a very strategic decision. It can only be taken by the top-levels of the Chinese leadership. At least that's what their published in their more formal of military writings.

Victoria: Question? If not, I guess I'll lead to...Do you have...?

Justin Park: Justin Park, of Intergalactic Education. I'd like to start off by saying great presentations, very informative. One of the things that was brought up is that China's trying to commercialize.

My question would be, what are they doing to soften some of the regulations that they're going up against competing with or they're breaking into markets that are closed off to them?

Male Participant: As I said, they understand that's a big hurdle to them. There's a lot of export controls for space stuff in the US, but from other countries as well, that exclude trade and dealing with China without a whole bunch of paperwork and other stuff.

I think they realize the challenge. I honestly don't know of any solution they've come up with other than to perhaps bring it up with the US policymakers and try and make that pitch.

I did have explained to me, somebody made a pitch that, well, in other sectors, Chinese state-run enterprises will have influence in policy-making.

The argument is that if we allow Chinese state-run enterprises to have a bigger role in the space sector and global markets, then they might have interest then they can wheel internally in Chinese decision-making. I don't know whether that will actually happen or not, but that's an argument that I've heard.

Victoria: Kevin.

Male Participant: The lesson that China has taken away that if it's impossible for them to launch a satellite with US components on board, the only way to get around that is to both develop your own launch capabilities, and to develop satellites for sale to the international community.

It may take a lot longer that way and may be more difficult, but they will nevertheless get to where they need to go.

That's their takeaway is that they need to rely more on themselves rather than any other country, which goes back to Gregory's point that said what is called a techno-nationalistic approach to science and technology. They really view this as more of an independent way of achieving their science and technology goals.

Victoria: One quick question and I think if there's nothing else, we'll wrap up. What do you guys think is the over-under for getting rid of the US congressional restrictions on US-China space discussions between White House and NASA?

Give me a percentage. [laughs]

Male Participant: Let's see if I get there. [laughs] There were a few writings during the campaign by the Trump campaign. There was at least one debate that I'm aware of. In that debate, the Trump representative at least they talked about the possibility of civil space cooperation with China.

But those people that were involved in the campaign side of things are not involved with transition though. I think at least on the Congressional side I've seen no hint that there's actually even a possibility. If anything, Representative Culberson seems to be even more intransigent than Representative Wolf was about the ban. I would say it's very low.

Male Participant: First of all, who would believe that Richard Nixon would want to go into China?

But here's the thing. I don't think that the ban came about in a vacuum, so to speak, right? I think that scientific advisor Holdren's basic pronouncement to Congress, "This is an Executive prerogative. We're going to do what we want to do."

When Representative Wolf and others said, "If you're going to go to talk to the Chinese, what are you going to talk about? It's not like you're doing business." That was really not the best way to build bridges to the House. I'm going to throw that out there. You can disagree.

That being said, a Republican president, a Republican House, a Republican Congress that decided that it wanted to use this as a tool with a scientific advisor who did not feel that it was his job to teach Congressmen who had been around for more than one term what their job was might have other opportunities.

I think that's going to be in the first hundred days. I'd say it'll probably come after appointing a new Supreme Court Justice, just as a guess. Probably a little further down the priority scale.

By three years in, I'm really not sure where we're going to be with regards to US-China relations at large, US-Russia relations at large, and therefore, space as one piece of all of this. Over-under, I'd say, to borrow from the late John McLaughlin, 10 being metaphysical certitude, I'd say probably around 1. But it's higher than zero.

Victoria: Gregory, you?

Male Participant: I agree with Dean. One interesting thing. The first decision that the United States may have to make on that is whether we want to send an astronaut to their space station.

They've invited international participation. I imagine that's going to be for developing nations who are part of the Chinese growing space association, but that maybe the first question the Trump administration has to answer on cooperation with China on space.

Victoria: [inaudible 96:41] ?

Male Participant: No, other than I'll agree with my other three colleagues here. I think it's very unlikely especially in the near term.

Victoria: Unless the panel has anything else you want to add, please join me in thanking them for a very spirited...

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