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Transcript

Crux of Asia Conference
Panel III: Space Security

Thursday, January 10, 2013
Washington, D.C.

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Transcript by Federal News Service
Washington, D.C.

KEVIN POLLPETER: OK, if we could get started here. If anybody's down in the overflow room, we have many seats available. It looks like we're – everybody – a lot of people ate lunch and – got their free lunch – (laughter) – and skipped out, it looks like, or went to go take a nap.

MR. : (Inaudible.)

MR. POLLPETER: What's that?

MR. : We are the lunch.

[00:01:29]

MR. POLLPETER: That's right. (Laughs.) OK, but, you know, it's the die-hards that remain. So that's what I like to see. OK, I'm very happy to moderate this panel on space. Space is actually – plays a very important role in our lives. People who follow space, for better or for worse, call it – sometimes call it a utility. It's something that's there that we use almost every day but we never realize it.

You know, if it's GPS, you know, guiding your car to wherever you need to go or making an ATM transfer or swiping your credit card at the gas station, you know, it's there doing its thing every day. And, you know, space literally saves lives. You know, with Superstorm Sandy that hit a few months ago, you know, without that satellite data, you know, we could have lost a lot more lives than what were lost.

So with that let me, I guess, first introduce myself. I am Kevin Pollpeter. I work at the Institute on Global Conflict and Cooperation at UC San Diego. So I just started there last week. And then we have Dr. Barath Gopalaswamy from the University of Illinois and then Dr. Shen Dingli. And I think we'll start out with Dr. Shen. So, Dr. Shen, take it away.

SHEN DINGLI: Thank you very much, Mr. Chair. I thank Ashley for inviting me and initiating this important project. I offer a very personal touch on this subject as surely I'm not in capacity to officially represent China, to offer China's position. And many of my friends know that I often differ from official Chinese position. So you ought not to be misled. (Laughter.)

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For instance, when Chinese government stated we would not participate in space arms race, I would say, wait a minute. We may need to hedge, to prepare some capacity. While some more and more openly advocate – (inaudible) – space militarily, I vehemently am opposed. I don't want to see this happen, but I can accept the hedging.

In space, Chinese traditionally has lots of nice thinking about space, about the moon, about a man and a woman living on the moon. And the PRC thought, as an independent great power, we ought to have space capability. And during the Cultural Revolution we succeeded in launching China's first satellite, like North Korea a while ago. They stated that they succeeded. We're not sure if they succeeded, but we succeeded – I think in 1971, when I was a pupil in primary school.

And during Cultural Revolution, China prepared manned space mission. And our magazine reported this. So in Shanghai, we have created a facility to train Chinese astronauts. So I read such official reporting as early as probably in 1973, '74. But this – that generation of Chinese trainee did not achieve their dream until much, much later. In the 21st century we succeeded in sending China-nauts – into space.

For what? Government would never say for military purpose. Firstly, I fully agree that we should do it for economic development, for major power status, for technological competence and for potential scientific, technological benefits. And some people think this is a white elephant, costing a lot, gaining a little. Wait a minute. With the half-success of China's GPS, what we call Beidou, 16 satellites already in space.

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When 30 – (inaudible) – would be completely in this Chinese constellation, China would make money from it, estimated at the level of hundreds of billions of Chinese yuan a year. It's a huge industry. It's for free, but over time you will get benefit. And this is for China's own economic development at the same time it would provide international economic public goods, so others can access such a navigation and guidance data for free. Not as precise as American GPS in terms of its civilian data yet, but it would make further progress.

So this is really for economic development, not only for China but for the world as well. Russia has its own – Russia has its version, but it's not in complete good service. Russia may improve. We cannot wait. We used to partner with European Union for its Galileo system, but that was too slow. And China started its own system. And we are ahead.

So America must view competition – competition is good, very good. When China-U.S. – it not only competes to offer free service to the world, all others would benefit – Chinese would benefit. Many Chinese still use GPS. But we expect that probably in 10 years, 84 percent of the Chinese market will be occupied by Chinese own – China's own system.

Many strategists would more think about the military application of China's space program, China's notion of space strategy, et cetera. And it would be very unlikely that China would develop all this system without any consideration of a defense utility for China's own benefit.

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At least the product itself would serve such an interest. China may have its own more precise – precision data for its own missile threat. The Chinese ancient strategy states that we should know myself and my opponent precisely – (inaudible). To know my opponent, we need to have those sensors, detectors – mainly from space – to know where it is, where it – how it moves and how fast. You need to build a space asset.

Those in the – in the space industry – in the space sector knows very well China's space wherewithal better than I do. I believe we are building up seeing the spectacular American performance in its Iraqi War of 1991. And 12 years later, when America attack Iraq again, the U.S. ground based force has significantly reduced, but American warfighting capability has quadrupled in

merely 12 years due to its enhancement of its sensorship. It knows its opponents, where they are and how they move every second. To trace them, you need to have these sensors.

The sensor has to be in space. So this is for defense purpose and for military purpose. Very hard for China not to develop and for India not to develop. You develop, not necessarily for a vicious purpose, not to monopolize the world, simply to know the potential opponent and in order not to be an – and imbalance the situation that I am known by my – by my opponent, I do not know who my opponent is. I need to know.

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We need to develop all these optical sensors, infrared sensors, those beyond the horizon radar and deployed in space to trace them. But at the meantime, we need to know ourselves. We certainly can use our own sensors to trace our own force, but we know when we deploy our force from beginning, we know where they are. But when they move, our leader may not know them every minute, and the force may not know where they are in every particular moment. So a space asset can help us and to transmit the data to those who need to know them.

So in my view, it's inevitable China, as a major power with independent foreign policy, don't want to be dominated and not necessarily to have a vicious plan to dominate the world, needs to have this. If India would have this plan, I would feel not odd. All major powers need to have it.

You can partner with another country to access the data, but that's never reliable. So as an independent power center in the world, you need to have your own system. Then the system can be vulnerable by the nature or by a manmade strike, and we have to harden our assets and to make them less subject to vulnerability.

That's very difficult to harden the system. You need to make sure that your other systems won't be vulnerable. So we see America's early experiment of ASAT program, Soviets. On January 11, 2007, China's. To this day, the Chinese government calls it a satellite experiment, not a professional – anti-satellite test because we know we are opposed to space weaponization.

But failing to get agreement with others who have this capability developed earlier, we don't want to be dominated in this space as we used to break nuclear monopoly on the surface of the earth. We used not to have nuclear deterrent and we were bluffed and we started to have. And we don't want to have quantitative balance and symmetrical. Not a quantitatively balanced deterrence is good enough for us. We want tell others we have some capability of this, so everyone need to be careful.

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But we were able to strike a balance and we did not want to strike a balance when we were not able to do. And when we are able to do, we still don't want to because no one can afford a single, successful strike. So why we need to do a lot to force others to do more to destroy us. We just want to make sure that we have limited, reliable, retaliatory capability with second strike mode. So don't bring harm to us.

And technically, we could bring harm to others in the first place, but is that what constitutes suicide. So some limited missile defense is understandable to make our friends safe. But when we are able to do some limited missile defense, then we would proceed.

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So, again, on January 11, 2008, a year later than our first satellite experiment, we succeeded in shooting down a Chinese missile in flight, in its mid-course. For a long time, we did not want to have such defense-sensitive military R&D information be known, but we announced. Quite different from what it was a year ago. We did not – we announced that we conducted an ASAT.

So some others observed that China did again, on January 11, 2010. That I'm not sure. My good friend at UCS, Gregory Kulacki, stated a few days ago if China would do again tomorrow, I think he would torpedo China. If China would indeed have a plan, China would not do it because all would follow this. We can choose another date.

So let me say, to assure that our Earth-based nuclear deterrent limited capability to assure that we have a minimum nuclear deterrent would not be neutralized, we have to make sure that no one would seek space dominance. But if no one would respond to us, we need to convince others that we can also attain your capability in space.

But at this stage, I suggest highly we do the R&D program as a way to bring others down to Earth, not move further into space. Otherwise, we have to strike a space-based balance of power. No one should be entitled to the monopoly of space hegemony. Oftentime, we see the single-power hegemony could stabilize the world, but sometime we see total opposite. But of course, no one can guarantee a two-party, multiple-party balance in space must be stable, but at least this would be a better alternative to those who would not have such a balancing capacity.

So before things would get worse, let's talk to make a joint effort that American space security should be respected, American nuclear deterrent should be needs to be respected, American legitimate national security ought to be respected. And we should make our effort to support America, to strengthen its legitimate national security. Likewise, our legitimate rights and India's legitimate rights and everybody's legitimate rights need to be guaranteed. So we need to work together through a cooperative fashion to build, in my view – either building no such military capacity in space and not to deploy them in space, or to build a limited, joint effort to defend as a cohort, for ourselves as a grouping.

[00:22:22]

Thank you very much. (Applause.)

MR. POLLPETER: OK, thank you, Dr. Shen.

BHARATH GOPALASWAMY: Good afternoon, everyone. I'm happy to share the panel that will either put you to sleep or wake you up after lunch. (Laughter.) I appreciate the opportunity to contribute to the volume and present my research. And I congratulate Ashley and Sean in bringing this edited volume. I also wish to thank the organizers at Carnegie for putting this event together.

Shen has made my task relatively easy – at the same time difficult – by mentioning a few of the motivations, but I'll start off this with an Indian perspective. The subject of space security, which at the beginning of last decade received scant attention in Delhi but has rapidly moved up the list of India's national security managers – the event that galvanized their attention was the Chinese anti-satellite experiment in 2007.

That event, more than any other episode, highlighted the need for long-term, deductive planning for space policy amongst Indian policy elites. Some of my chapters' conclusions are based on open-source data, but the majority of the conclusions are based on my interviews that I conducted over the summer with national security officials that manage space policy in India.

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Indian space policy, I broadly classify the planning on four levels. The first is militarization, the second is weaponization, the third is the debris problem and the space situational awareness, and the fourth is India's approach to its international treaties and frameworks regarding the governance of space.

On militarization, I meant the use of space assets to perform intelligence surveillance and reconnaissance functions. One of the first writings that appeared in this subject in India was in 1980 from the air force; it did not receive much attention. And in 1990s, the First Gulf War was in a way that highlighted that space assets could be used for military purposes, and that was when the parliamentary standing committee in 1997 recommended the creation of an aerospace command.

But it received relatively scant attention from the Defence Ministry, and it was failed to pick up. But 1999, the war India fought with Pakistan on Kargil was when the importance of these assets were highlighted. One, at the height of the war India had to depend on satellite imagery – image corporations, like – (inaudible) – satellite for satellite images. In spite of having relatively substantial space assets, they did not have an asset that they could get their own satellite images.

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The next was – few months ago, Benjamin Lambeth published a report at Carnegie on airpower. And at that – in the report, he mentions that there were – there were no navigational equipment fitted to any of the aircrafts that India used over Kargil. The GPS receivers were bought and fitted into the aircrafts at an ad hoc basis. So the navigation was one of the other component that they realized that they needed.

So in order to meet the demands of the armed forces at the strategic and the operational level, the Indian government finally instituted the Integrated Space Cell within the Integrated Defence Staff as an intermediate step to the aerospace command in 2008. At its inception, the Integrated Space Cell envisaged three conceptual scenarios as the basis for planning and strategy development. Scenario one imagines a program of managed asymmetry in the regional balance of power. It envisions gradual increases in India's military-specific intelligence, surveillance, and reconnaissance and navigational capabilities.

The scenario two imagined conditions of demonstrated strikes by China in the integration of C4ISR, and increased cooperation between Beijing and Pakistan. The envisioned Indian response under this scenario is the integration of space and network-centric capabilities to prevent regional power asymmetries from halting any further deterioration in the balance of power.

The third scenario imagined demands for space assets under conditions where India assumes a broader role in the Indian Ocean region. It envisions India using space assets with its maritime defense capabilities to project force in the entire region.

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So preparing for these scenarios, the ISC also envision the following technical capabilities. The first is imagery and surveillance capabilities. Naturally, all these assets are dual-use, but if you look at the 11th and 12th five-year program, the sum of the assets chosen by India are consistent – I could elaborate on the assets – some of them is elaborated in the chapter – but it's consistent with the three scenarios.

The second is positional and navigational capabilities. In the positional and navigational capabilities, one of the things that has to be kept in mind is none of the Indian delivery systems today that use GPS have any contract at the service provider level or at the state level with the United States, for example. So Agni-V or Agni-III has a GPS, and it solely depends on the promise that they will work under tense conditions.

But an important thing to be kept in mind is here, also – the Indian Ocean region and the Arabian Sea – geographically, where India is located, the GPS signals provide large amount of errors. That's why India uses the GAGAN, which is a sort of technical augmentation to the signals that it gets. So as a – as a backup, the Russian GLONASS system is used. And India has been iffy of – been watching the press; they have recently inked the agreement as late as December, 2011 with Russia for working jointly together on the GLONASS system.

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The third is communication. I need not elaborate. You have a strong, growing, 1.2 billion commercial, as well as India's assets in – India's increasing assets. So communication is obviously on the rise, too.

The next major issue is weaponization. Naturally, India's growing assets – dependence – but India's growing assets also make it potentially vulnerable. So – and especially, this is – after the Chinese demonstration of the ASAT capabilities, this has – this has brought more attention. While China may not – may or may not use ASAT capabilities to target India's assets, it definitely factors a – it definitely factors into the Indian decision-making.

You have probably seen various statements coming out of India about developing ASAT capabilities, but that does not necessarily mean that India has instituted a formal ASAT program. So under what – but Indian national security officials strongly insist for developing the retaliatory capabilities, but not necessarily testing them. But when would they test them? Those circumstances are still evolving amongst policy elites.

On the policy front, Indians echo their experience with the Non-Proliferation Treaty. So if some kind of – there is talks of treaty that might force them to test on the technical front. An event in the magnitude of Chinese ASAT test might prompt them to test, but it must be ultimately – it must be underscored that any Indian ASAT test in the future will only be a response-based event.

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The third issue is space debris and space situational awareness. SSA is an important area, and Indian technical and security officials privately acknowledge that it's an underinvested sector. And they must be conscious about the growing problem of debris. It is – it is sensitized in many of the establishments, but it's still gaining – it's gaining fast attention. Indian policymakers also acknowledge that it would pose huge and tremendous challenge in terms of resources to build a comprehensive SSA.

And at the same time, they also opine that any SSA that they build will be complementary to the American system. So they are – they're cognizant of the fact – in the short run, what they concur is – in the short run, they concur that external cooperation will be the best. And one of their best partners would be the United States. But the legacy of sanctions still lingers amongst mid- and senior-level bureaucratic officials and the technical officials who are managing these capabilities. And they want such a proposal to be – to come from the United States and at a substantially higher level to have any impact in forging a closer cooperation with India.

The last level is the International Code of Conduct. Several leading Indian strategic analysts have voiced their belief that India must be proactive in taking the lead in shaping any future regimes such as the recently proposed code of conduct on space issues. India at the moment does not have an official position on the issue. But this is – this is an issue that's received substantial attention in Delhi.

However, India's concerns with code of conduct are threefold. First, many officials who occupy senior positions in Indian policy circles believe that India has yet to attain self-sufficiency in terms of capabilities to the point where it can engage in serious negotiations. Second, Indian security managers have serious concerns about the developments in their immediate neighborhood and a code of conduct's ability to address those concerns. Finally, that they would prefer that a proposed code of conduct protects India's space-related interests and capabilities and maintains a – its autonomy for action – for action.

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So I'll conclude here, saying India's approach for space, for strategic purpose and achieving security, has so far been measured and exploratory. The Indian civilian space agency issue a strict firewall rules to cordon off civilian space assets. While India's national security agencies have only used some of these assets within the legally accepted limits of the Outer Space Treaty, there is a caution amongst policy elites to developing – (inaudible) – kinetic energy ASAT weapons. And policymakers at the highest levels also realize that testing an ASAT weapon is not necessary – not necessary, at least, in the near future. And they're – and they're also – they're also wary about the consequences of the weaponization of space.

Finally, Indian policymakers also attached considerable importance to the code of conduct, which they believe will lay out the rules for the road for responsible behavior in space. Understandably, they approach such multilateral instruments with a sense of caution, because their past negative experience, primarily with the Nuclear Non-Proliferation Treaty. They also seem to be prudent in the code of conduct – they believe that the code of conduct will not be a one-stop solution for all their problems and concerns in space. But they – but they need a forum where they can convey their concerns in a civilized manner, and the code of conduct offers such a multilateral framework for them. Thank you. (Applause.)

[00:33:44]

MR. POLLPETER: OK. Thank you to both of you for very insightful comments.

In reading over the papers this week, what struck me about both papers was what the U.S. Defense Department would call that space – their concerns that space is becoming what they say the three C's – congested, competitive, and contested. And what do they mean by that? Congested: Space is a different physical environment than the ocean or the air, and that there are only a certain number of orbital slots that are available to satellites. And there are beginning to be an increasing number of satellites, especially in low Earth orbit. And we're beginning to fill that orbit up. And as more entrants into space, such as India and China, become more prominent, you know, those – the position – the competition for those orbital slots will only increase.

There's another type of congestion being caused, and that is by debris that is up in space, especially low Earth orbit. Debris has – is especially hazardous. Satellites and space stations are relatively fragile things, and it doesn't take much to actually put them out of service. The one spectacular example, of course, was a fleck of paint actually hit the space shuttle windshield back in 1983 and caused a concerning crack in the – in the – in the windshield. Of course, nothing ever happened of it, but that shows you just how damaging space debris can be. And of course, we've had the 2007 Chinese ASAT test, which created over 3,000 bits of debris. And then there was the 2009 collision between a Russian Kosmos satellite and a U.S. Iridium satellite, which just goes to show you that the low Earth orbit is becoming increasingly crowded.

There's also radio frequency interference, in that you can't put too many satellites too close together – (inaudible) – else their radio signals were (sic) overlap and will cut each other out. And it's estimated that by 2015, there'll be over 9,000 satellite communication transponders up in space. And somehow we will need to have to deconflict the use of the radio frequency spectrum.

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What's the second C? The C – the second C is competitive. And this is more of an economic angle, that as more countries become involved in space, they're going to produce their own satellite navigation systems with their own satellite receivers. They're going to market their own space launch capabilities. And this will present a challenge to the U.S. space industry, and we will need to do things to be – to stay competitive.

And then lastly, space is becoming contested. And there are an increasing number of man-made threats that are becoming quite worrisome to the U.S. military. We've seen China's ASAT test, both in 2007 and sort of a de facto ASAT test a couple years later. And then also we've heard

Dr. Gopalaswamy talk about that India may be interested in developing its own counterspace capabilities. And so the proliferation of these types of weapons naturally has the U.S. military concerned.

But what struck me about the papers when I read them was that we seem to be entering a period of uncertainty, that we've actually stepped into a security dilemma with the U.S., China and India. And they're not necessarily all directed at each other, but we both – we've all heard that both China and India took a cue from the 1991 Gulf War, where the U.S. – which was called the first space war. And they took the cue from there that space can – is a great force enabler for a military.

But then China took that a step further and realized that our dependence on space – excuse me, our use of space – was also an Achilles heel, that if they were to develop ASAT capabilities, they could direct it at our assets that we rely on most. And they – in their writings, they say that the U.S. military depends on space for 80 percent of its communications capability and anywhere from 80 (percent) to 90 percent of its intelligence capability. And if a – and if a military relies that much on space for those capabilities, it only behooves a potential opponent to hold those assets at risk.

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And so what I see here is the – China responding to what it sees that it needs to defend itself against the U.S. But then what isn't taken into account on the Chinese side is some of the reactions from its neighbors. And that's what we're getting here with India, that once India sees its – the Chinese conduct its own ASAT test, then it also begins to consider the development of counterspace technologies. And if you were to actually broaden this out to Asia writ large, you would also see that there are also some voices in Japan now that are saying they need to develop their own counterspace capabilities.

So what I see here developing is some sort – maybe a low-level sort of space arms race in Asia, which is worrying. Arms races are never good; but also, we have two new entrants into the field of high-tech weaponry that have – they – both of them have not conducted major wars. And nobody's really ever conducted an extensive space war. We don't really know how to conduct one, and we don't know what the ramifications are of conducting them.

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Now, does this mean that China or India will automatically use space weapons? Not necessarily. If you look at the U.S. and Soviet Union's experience during the Cold War, we more or less allowed each other to operate in space. We came to some sort of maybe unstated agreement about how things should operate, both unstated and within treaties, right? So we learned to at least leave each other alone to a large extent in space. But that took some time in doing, and it came to through realization, both on the U.S. and the Soviet side, about how to do that. It was kind of a slow process; it took a number of years to do that.

My concern is that, you know, will – with new entrance into the field of space and space warfare – will we have that same learning process continue? And certainly, it's encouraging that Dr. Shen and Dr. Gopalaswamy have stated about China and India are, you know, wanting to develop space weapons rather than use them, but there are also a lot of other writings in China which

actually state that they would prefer to use space weapons. And so what you – what you have is you have a lot of writings of – espousing the benefits of space warfare.

And so I think there is a risk, as more players become involved here, of miscalculation on many sides. And so, for example, on the – on the Chinese side, we see a – you know, you almost have to read every – almost every article or book on space warfare begins with, whoever controls space controls the Earth, OK. There's a lot of discussion of sort of Star Wars, Star Trek-types of depictions of space warfare, of manned spaceships docking with space stations fueling up, re-arming, heading back out to take the fight to the enemy, OK? So there are sort of these more Buck Roger-y's types of depiction, and what you don't see is a lot of discussion, at least in the Chinese writings, about some of these assumptions about space warfare.

So my concern is that we have – OK, I'm a political scientist, OK – but we have a lot of political scientists that are writing about space warfare, and yet, they are not maybe fully informed by the physics of how these things happen, and how – and that the engineering side, the actual space warriors, are not at least putting input into the – into the doctrinal process, OK? And you know, God forbid, we have political scientists, you know, figuring out doctrine, OK, right?

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So as I see it, they're – at these beginning stages, there's a lot of, at least, concern on my part that they're all miscalculations that could be – that could be had here and that – you know, do we have to go through a learning process with now not just the U.S. and former Soviet Union but also, you know, China, India and whoever else decides to get into the game? And that to me seems to be a lot more destabilizing.

And of course, there are ramifications for this for the U.S., not just for China and in India, let's say, if they get into a conflict. But you know, space is out there for all. And the activities of one actor can ruin it for everybody else. And so if we get into a shooting space war that causes debris and not only may take out a Chinese satellite or an Indian satellite, it can – it can prevent the U.S. from operating effectively in space. So the U.S. has its own equities involved here.

So actually, you know, even though I'm somewhat encouraged by what the two presenters have said here, that this is more maybe of a – they want to develop a latent deterrent force, actually, overall, I'm pessimistic in that I see more uncertainty and more danger in the years ahead, as more and more nations decide to develop in some way their own counterspace capabilities.

So with that, I will cut off. And I will open it up to – I think we'll go two at a time. And we'll take this gentleman here, and then Victoria, we'll go with you.

Q: Arda Tinji (sp) from Council for Strategic Affairs. The question is to Professor Dingli. It's a two-part question. Number one – and you can use your divine intent because you are divine professor – whether or not PRC will do the third ASAT test? It may not be January 11th.

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Second part of the question is, it is an open secret that China proliferated nuclear capability to Pakistan. Before Pakistan openly tested, they were given 50 kilograms of highly enriched uranium

by China, and they did their first weapon test in 1990 at the Chinese test site. (Inaudible) – do it, will PRC claim this time they proliferate ASAT warfare capability to Pakistan?

MR. POLLPETER: OK, then Victoria.

Q: Good afternoon, this – my name is Victoria Samson; I'm with the Secure World Foundation. A lot of times we discuss India and China in space, the implication is it's an antagonistic relationship. And certainly, there are many in the United States who want to work with India simply because it's a way of countering the Chinese. I'd be curious to hear your opinions on whether or not China and India could ever cooperate in space, but would hate to get to that point because I know it would freak the United States out. Thank you. (Scattered laughter.)

[00:46:12]

MR. POLLPETER: Please, Dr. Shen, you want to start off there?

MR. SHEN: As I mentioned at the outset, I cannot speak for my government. Only my government can decide whether and when we will have another test. So I do not know. I hope we will not test – not test anymore, to encourage India not to test and to encourage America not to test. We're in the middle. We did it before India would do, and we're way behind of America. If we were to not do, we would be morally encouraging in America. If we would not do, we would let India to have less psychological impact that China is leading. So I hope that we will not do anymore.

Second, I'm a nongovernment-based researcher. I have heard of lots of those allegations that you have mentioned. I really am not provided with such closed data. So I cannot – neither confirm nor deny. I cannot say China has not done it. I also say, tell people, I cannot support my government's denial. The government has interest, even if tides have turned, it would not – for its interests, it would not admit. But I do not know. I cannot either support or not to support government.

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I would say, first, if we have done, it's – it happened at a particular time background, Cold War, when U.S. tolerated Israel. And even during the entire terrorist war time, U.S. still tolerated Pakistan, to make Pakistan a non-NATO strategic ally, regardless the A.Q. Khan chain of proliferation. So it's not only that China might have some problems; America may have even bigger problem.

But I can understand America has a priority of national security interests. That was not time to fix Pakistan's previous problem, and not to invite a strategic friend to come back to Afghanistan-based terrorism, which posed vital threat to America. But does that – having said that, that does not reduce the importance of nonproliferation at all to America by dealing with Pakistan in a right way. So even if China has done something – and China may not have done that particular thing.

So that's my answer. I would keep all possibility open, but would try to understand why that happened, why this may not be confirmed, at least by my own source of import, but we should make it never to repeat in the future because fundamentally, it hurts China. It hurts China's own

interests and hurts China's credibility. And – but what has happened has happened. We can only make sure the lesson would not be wasted.

MR. POLLPETER: And can you respond to the second question about potential for cooperation between China and India?

MR. SHEN: Huge, huge. We want to cooperate with anyone. We proposed many times to America, and we have lots of frustration with success with U.S. government. And we have – may have not proposed to India, and India may have lots of caution – (laughs) – for any proposal from China. I am the only Chinese who wrote in Chinese official media to congratulate Indians nuclear weapon testing.

Indians nuclear weapon testing – I wrote a piece that was published by Shanghai-based Wenhui Daily, before Chinese government issued any reporting guideline to them. So they were late. (Laughter.) So Indian government appreciate me. (Laughter.) Why? Because I think when we have security pressure, we would go ahead. China would always say, we have not threatened India, but India would think differently.

[00:51:03]

They would think anyone they fought against India to make India look bad for the land that ought to belong to India, and then, after that awkward border clash, then that particular country has attained nuclear weaponry. India would not view it as something to promote India's national security. So India would never threaten us, would never use India's nuclear capability in the first place, but that would be better to have something to enable India. So if I'm India, I would think this way. So in – since this is a legitimate reasoning, so we – Chinese should respect. So I should wear Indian's shoe and to congratulate – (inaudible).

So when India shoot a moon orbiter, I wrote my English piece to congratulate India. I – somehow, I hoped India would send cable to China to congratulate China when China send its own moon orbiter, but India did not. I did not see any single piece from any individual Indian, and I hope Dr. Kondapalli in the future would do it. (Laughter.) My argument is that it's for civilian exploration. It's to enhance the global command of the celestial space. So why does – has to be Chinese only? Why we cannot accept India's success? So Mao Zedong – (inaudible) – used to have a big heart. Your success is my success, so we should take India's pride as China's pride. I also hope Indian would take Chinese pride as Indians' pride.

If we can resolve this mentality issue, I think we would have a lot of China-U.S. cooperation for peaceful purpose only, and China-India and India-U.S. China should congratulate Indian people to sit in the U.S. space shuttle or any space vehicle, and India would not feel bad if China would have its own Beidou. And China could invite India to invest in China's Beidou to have a piece of pie to share. So this is a dream world that I – every day I have.

[00:53:27]

MR. POLLPETER: OK. Dr. Gopalaswamy?

MR. GOPALASWAMY: I'll take your answer as my answer. (Laughter.) I'll just – it's a very small answer that I have. I think the potential for cooperation between India and China, even amongst the civilian space elites, rests in the space situational awareness capabilities. That's where many in civilian space agencies believe – where the potential the lies because, as I mentioned, there is no country that is individually equipped to perform a comprehensive space situational awareness,

And China has sensors that restrict it; the Americans have sensors that can only look at their objects. The Indians' space situational awareness capabilities are very limited. And over the last three years, if you look at the number of conjunction warnings that the Indian satellites have received, the threat is growing to Indian satellites. So I think, sooner or later, there will be some measure – I think when this threat gets to a point where they will be compelled to act.

[00:54:30]

MR. POLLPETER: OK, next? OK, this gentleman – one more? And we'll go with you second, OK –

Q: Yeah. Bill Jones from Executive Intelligence Review. I think, from what all three of you said, that it's absolutely the case that the paradigm must change. The – and people will not stop going into space; that really is the frontier. Anybody who wants to advance the cause of humanity has to look into the heavens. We are now making our cosmic reach of mankind. There are threats out there that we're going to have to face in years, including the asteroids and comets that could, at some point, again, hit the Earth. We don't have capabilities of dealing with that, but we should work in that direction. Curiosity on Mars – things like that could be a very useful help in doing that, but the cooperation is going to be absolutely necessary, because, if everybody's trying to do it themselves you get into a lot of problems.

You mentioned, Kevin, the cooperation – you mentioned the agreement between the Soviet Union and the United States. I would go further and say it was not just that we let each other do certain things but that we actually had open cooperation. We went onto the Soyuz mission; there was the International Space Station, and even though we were still technically foes in many respects, we learned that nature of cooperation. And I think that helped to create the climate in which we could resolve some other problems.

I think it would be great if India and China cooperated, but I have a feeling that the United States has to play a role in this, that the United States has to take a step towards cooperating with China. I know that Dan Golden had told a friend of mine when President Clinton went to China that they had discussed the possibility of a Chinese astronaut going onto the International Space Station, but that because of the so-called technology questions, the State Department had said no.

So there hasn't been – and of course, as Professor Shen said – that the Chinese, for years, were saying, we want to cooperate with you and not simply do it ourselves, but we have never opened up that. I think that would be necessary in order for countries – for India and China to cooperate to get that problem out of the way, and I hope we're on the road to do that.

[00:56:53]

MR. POLLPETER: OK. Second question.

Q: Thank you. I'm Genie Nguyen with Voice of Vietnamese Americans. I thank Dr. Shen for your attitude and your – I like to share with you one thing that Vietnam and China has in common. Years ago, in the Tang Dynasty, there was a story that China – the king of China has already entered the moon – (laughter) – and there was a Vietnamese beautiful lady had accompany him up there in the moon.

[00:57:17]

MR. SHEN: Really?

Q: Yeah. (Laughter.) And every mid-autumn festival, the children of Vietnam dance beautiful dance to celebrate both the king of China and the Vietnamese ladies up there in the moon.

MR. SHEN: They drink a – (inaudible) – wine on the moon.

Q: Yeah – yes, and there was a poem written by Li Bei – Li Bai?

MR. SHEN: Li Bai.

Q: Li Bai? A Chinese poet.

MR. SHEN: Li Bai.

Q: Li Bai.

MR. SHEN: Li Bai.

Q: Yeah, yeah. So then we did have that – we did congratulate you – but see what China did to us now? (Laughter.) So anyway, let me come back to the – let me superimpose the space onto the sea, because I think to – I like the idea of international code of conduct, and I believe that the space, the air and the sea all, in a way, work together. So come back to that. Is there a way that we can cooperate with the leadership of U.S. with the space and air and sea code of conduct that Vietnam can somehow can drink wine with the Tang Dynasty king?

MR. SHEN: May I make a response?

MR. POLLPETER: Yeah, go ahead.

[00:58:20]

MR. SHEN: (Inaudible) – you raised a question, and I want to intervene – (laughs) – but the answer – we run out of time. The question you mentioned is that, why China has hurt Vietnam numerously, repeatedly in the last 20 years? Yes. It's a – it's a perception. You're measuring against the Vietnamese government position of 1958 and 1960s. It's the Vietnamese government now that has violated its government's, in 1950s and '60s, the mission. Spratly and Paracel belong to China. We have long to clarify, so my view is that we may hurt Vietnam with your current standard. We

may less hurt Vietnam with your previous standard, but you can teach me why this is not the case, but I may discuss with you how I got this impression.

So slow dialogue, slow interaction, honestly, we could reach a better common understanding. What's your true meaning in 1958 and how I interpret that? When you keep disagreeing, I think you – I have more eagerness to engage you, to know why I have been wrong for so many years. Why I should not keeping wrong to hurt you, and in turn to hurt myself because, in my value, Vietnam is China's friend. I – the last thing I would do is to hurt Vietnam.

MS. : (Off mic.)

MR. POLLPETER: (Off mic.)

MS. : Go back to the space –

MR. SHEN: Individual base – individual base. (Off mic.)

MR. POLLPETER: If we – if we could – Doctor – yeah, we've got to – we've got to hold on – we've got to hold on, because we're running out of time, so if we could just wrap up.

[01:00:41]

MR. SHEN: Yeah, but I hope this will become Chinese government's position.

Q: (Off mic.)

MR. SHEN: And if this approach would be taken, we would less – would have less room for distrust. So China would have less motivation not to invite Vietnam. And you would approach to Japan, EU, U.S. and China not to ignore China, to ask you for a cooperative program. So I think all of these are linked together how China views Vietnam as someone that hurts – that has hurt our sovereignty.

[01:01:23]

If Chinese government – this government and the people it has educated keeps viewing Vietnam as some aggressor – so, less chance for maritime cooperation and for space cooperation. So you need to convince us that we are wrong, and I would say, when I see your different view, I think I need to talk to you before I would do anything else in order not to create more damage.

Q: Let's talk off line.

MR. SHEN: Yes.

MR. POLLPETER: OK. You want to say anything?

MR. GOPALASWAMY: I'm not sure about the air and maritime domains, but on the space domain, the discussions on the draft code of conduct are going on, so you'll just have to wait and watch.

MR. POLLPETER: Right. Yeah, the U.S. and the Soviet Union did cooperate to some extent, but generally space follows the broader overall relationship, and the Apollo-Soyuz mission didn't happen until détente happened. We were actually developing our own space station, Freedom, minus the Soviet Union, until after the Cold War. So there's always room for cooperation, but generally – and that – this doesn't mean that it has to be true – but generally cooperation in space has followed a broader, better – or improvement of relations between two countries. And right now, the relationship between China and the U.S. is not so that that – maybe that could be pushed.

[01:03:02]

There's a harder fact on cooperation, is that there is a U.S. law that prevents NASA from cooperating with China right now, which may be difficult to get over. So there are all sorts of impediments right now to cooperation. But on that, I will wrap it up. I think this is a good instance of where we see how legitimate interest is in the eye of the beholder, and how that does create security dilemmas and does not, maybe, bode well for things in space. But let's congratulate the two paper writers on two good presentations, so. (Applause.)

[01:03:50]

(END)