

**CHINA'S OFFENSIVE MISSILE FORCES**

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**HEARING**

BEFORE THE

U.S.-CHINA ECONOMIC AND SECURITY REVIEW COMMISSION

**ONE HUNDRED FOURTEENTH CONGRESS  
FIRST SESSION**

WEDNESDAY, APRIL 01, 2015

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UNITED STATES-CHINA ECONOMIC AND SECURITY REVIEW COMMISSION

WASHINGTON: 2015

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The Commission was created on October 30, 2000 by the Floyd D. Spence National Defense Authorization Act for 2001 § 1238, Public Law No. 106-398, 114 STAT. 1654A-334 (2000) (codified at 22 U.S.C. § 7002 (2001), as amended by the Treasury and General Government Appropriations Act for 2002 § 645 (regarding employment status of staff) & § 648 (regarding changing annual report due date from March to June), Public Law No. 107-67, 115 STAT. 514 (Nov. 12, 2001); as amended by Division P of the “Consolidated Appropriations Resolution, 2003,” Pub L. No. 108-7 (Feb. 20, 2003) (regarding Commission name change, terms of Commissioners, and responsibilities of the Commission); as amended by Public Law No. 109-108 (H.R. 2862) (Nov. 22, 2005) (regarding responsibilities of Commission and applicability of FACA); as amended by Division J of the “Consolidated Appropriations Act, 2008,” Public Law No. 110-161 (December 26, 2007) (regarding responsibilities of the Commission, and changing the Annual Report due date from June to December); as amended by the Carl Levin and Howard P. “Buck” McKeon National Defense Authorization Act for Fiscal Year 2015, P.L. 113-291 (December 19, 2014) (regarding responsibilities of the Commission).

The Commission’s full charter is available at [www.uscc.gov](http://www.uscc.gov).

May 26, 2015

The Honorable Orrin Hatch  
President Pro Tempore of the Senate, Washington, D.C. 20510  
The Honorable John A. Boehner  
Speaker of the House of Representatives, Washington, D.C. 20515

DEAR SENATOR HATCH AND SPEAKER BOEHNER:

We are pleased to notify you of the Commission's April 01, 2015 public hearing on "China's Offensive Missile Forces." The Floyd D. Spence National Defense Authorization Act (amended by Pub. L. No. 109-108, section 635(a) and amended by Pub. L. No. 113-291, Section 1259 B) provides the basis for this hearing.

At the hearing, the Commissioners received testimony from the following witnesses: Mark Stokes, Executive Director, Project 2049 Institute; Toshi Yoshihara, Ph.D., Professor and van Beuren Chair of Asia-Pacific Studies, U.S. Naval War College; Dennis Gormley, Senior Lecturer, Graduate School of Public and International Affairs, University of Pittsburgh; Christopher Twomey, Ph.D., Associate Professor, U.S. Naval Postgraduate School; Christopher Yeaw, Ph.D., Director, Center for Assurance, Deterrence, Escalation, and Nonproliferation Science and Education, Louisiana Tech Research Institute; James Acton, Ph.D., Co-Director of Nuclear Policy Program and Senior Associate, Carnegie Endowment for International Peace; Robert Haddick, Independent Contractor, U.S. Special Operations Command; Evan Montgomery, Ph.D., Senior Fellow, Center for Strategic and Budgetary Assessments; and Elbridge Colby, Gates Fellow, Center for New American Security. The hearing explored the advancement of China's offensive missile forces—both conventional and nuclear—and security implications for the United States.

We note that prepared statements for the hearing, the hearing transcript, and supporting documents submitted by the witnesses are available on the Commission's website at [www.USCC.gov](http://www.USCC.gov). Members and the staff of the Commission are available to provide more detailed briefings. We hope these materials will be helpful to the Congress as it continues its assessment of U.S.-China relations and their impact on U.S. security.

The Commission will examine in greater depth these issues, and the other issues enumerated in its statutory mandate, in its 2015 Annual Report that will be submitted to Congress in November 2015. Should you have any questions regarding this hearing or any other issue related to China, please do not hesitate to have your staff contact our Congressional Liaison, Reed Eckhold, at (202) 624-1496 or via email at [reckhold@uscc.gov](mailto:reckhold@uscc.gov).

Sincerely yours,



Hon. William A. Reinsch  
Chairman



Hon. Dennis C. Shea  
Vice Chairman

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## **CHINA'S OFFENSIVE MISSILE FORCES**

WEDNESDAY, APRIL 01, 2015

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### **U.S.-CHINA ECONOMIC AND SECURITY REVIEW COMMISSION**

*Washington, D.C.*

The Commission met in SD-562 Dirksen Senate Office Building, Washington, DC at 9:00 a.m., Vice Chairman Dennis Shea and Commissioner Katherine Tobin Ph.D. (Hearing Co-Chairs), presiding.

#### **OPENING STATEMENT OF COMMISSIONER KATHERINE C. TOBIN, PH.D. HEARING CO-CHAIR**

HEARING CO-CHAIR TOBIN: Good morning, everyone. Good morning and welcome to the fourth hearing of the U.S.-China Economic and Security Review Commission's 2015 Report cycle.

I want to thank our witnesses for being here and for the time that they have put into preparing their written statements.

Today's hearing will explore the advancement of China's offensive missile forces, both conventional and nuclear, and the implications of this modernization for the United States. The Commission last examined China's nuclear developments in 2012, and we are returning to the topic today, three years later, looking more broadly at China's missile forces.

Since its establishment in the 1960s, the Second Artillery has been at the core of the PLA's nuclear deterrence mission. However, China's interest in diversifying its nuclear deterrence away from solely ground-based systems means there is now involvement of other PLA branches and services in China's nuclear command and control structure. In 2015, for example, China is on the cusp of a sea-based nuclear deterrent.

China is also seeking improvements to its nuclear forces through the development of advanced missile technologies, such as MIRVs and hypersonic glide vehicles. As questions arise about whether or not China's "no first use" doctrine is, in fact, an absolute prohibition, we ask how will the PLA's nuclear advancements change China's strategic calculations? We hope today's discussion will shed light on that matter.

I'll now turn the floor over to my co-chair, Vice Chairman Shea. Before I do so, though, I would like to thank Senator Harry Reid and his staff for securing this room for our hearing.

**PREPARED STATEMENT OF COMMISSIONER KATHERINE C. TOBIN, PH.D.  
HEARING CO-CHAIR**



U.S.-CHINA ECONOMIC AND SECURITY  
REVIEW COMMISSION

**Hearing on “China’s Offensive Missile Forces”**

**Opening Statement of Commissioner Katherine Tobin  
April 1, 2015  
Washington, DC**

Good morning, and welcome to the fourth hearing of the U.S.-China Economic and Security Review Commission’s 2015 Annual Report cycle. I want to thank our witnesses for being here, and for the time they have put into preparing their written testimonies.

Today’s hearing will explore the advancement of China’s offensive missile forces—both conventional and nuclear—and the implications of this modernization for the United States. The Commission last examined China’s nuclear developments in 2012 and we are returning to the topic today, three years later, looking more broadly at China’s missile forces.

Since its establishment in the 1960s, the Second Artillery has been at the core of the PLA’s nuclear deterrence mission. However, China’s interest in diversifying its nuclear deterrence away from solely ground-based systems means there is now involvement of other PLA branches and services in China’s nuclear command and control structure. In 2015, for example, China is on the cusp of a sea-based nuclear deterrent.

China is also seeking improvements to its nuclear forces through the development of advanced missile technologies, such as MIRVs and hypersonic glide vehicles. As questions arise about whether or not China’s “no first use” doctrine is in fact an absolute prohibition on first strike, how will the PLA’s nuclear advancements change China’s strategic calculations? We hope today’s discussion will shed light on this matter.

I’ll now turn the floor over to my co-chair, Vice Chairman Shea. Before I do so, I would like to thank Senator Harry Reid and his staff for securing this room for our hearing.

**OPENING STATEMENT OF VICE-CHAIRMAN DENNIS C. SHEA  
HEARING CO-CHAIR**

VICE CHAIRMAN SHEA: Well, thank you, Commissioner Tobin, and welcome everyone and thank you for joining us today.

Until recently, the Second Artillery's arsenal consisted of only nuclear ballistic missiles. With the development of China's conventional missile forces since the 1990s, that has changed. Initially focusing on shorter-range missiles for Taiwan contingencies, the PLA has expanded its strike options by developing longer-range missiles and developing a variety of launch platforms. The PLA's anti-ship ballistic missile, for example, provides China the ability to threaten U.S. Navy aircraft carriers from the Chinese mainland.

In line with its rapid buildup of conventional capabilities, the Second Artillery appears to have improved its bureaucratic stature within the PLA. Once considered merely a supporting force to the ground, air, and naval services, the Second Artillery now occupies a central role in PLA deterrence strategy and warfighting.

Although conventional weapons provide China with additional flexibility in its national deterrence strategy, the risk of escalation remains high. Wrongly estimating an adversary's perception of a conventional missile strike could quickly escalate the conflict to involve additional parties or even to the nuclear realm.

As the United States continues to reconsider its presence and strategy in the Asia-Pacific, the Commission seeks to better understand the implications of China's offensive missiles, not only for the United States but also for our friends and allies in the region.

As a reminder, the testimonies and transcript from our hearing will be posted on the Commission's Web site, [www.uscc.gov](http://www.uscc.gov). Today's hearing is webcast, and you'll find the webcast on our site as well.



**PREPARED STATEMENT OF VICE-CHAIRMAN DENNIS C. SHEA  
HEARING CO-CHAIR**



U.S.-CHINA ECONOMIC AND SECURITY  
REVIEW COMMISSION

**Hearing on “China’s Offensive Missile Forces”**

**Opening Statement of Vice Chairman Dennis Shea  
April 1, 2015  
Washington, DC**

Thank you, Commissioner Tobin. Welcome everyone, and thank you for joining us today.

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Although conventional weapons provide China with additional flexibility in its national deterrence strategy, the risk of escalation remains high. Wrongly estimating an adversary’s perception of a conventional missile strike could quickly escalate the conflict to involve additional parties, or even to the nuclear realm. As the United States continues to reconsider its presence and strategy in the Asia Pacific, the Commission seeks to better understand the implications of China’s offensive missiles not only for the United States, but also for our friends and allies in the region.

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## **PANEL I INTRODUCTION BY VICE-CHAIRMAN DENNIS C. SHEA**

VICE CHAIRMAN SHEA: Now, to Panel I. This panel will examine China's addition of significant conventional strike capabilities to an arsenal that, until recently, comprised only nuclear ballistic missiles. Our expert panel will assess the reasons behind this expansion, the current capabilities of China's conventional missile forces, specific technological improvements, and key considerations for the United States.

Mark Stokes, who is a frequent visitor to our hearings--thank you, Mark, for being here--is the Executive Director of the Project 2049 Institute, which he founded in 2008. He is a 20-year U.S. Air Force veteran and served previously in the Office of the Assistant Secretary of Defense for International Security Affairs. Mr. Stokes has testified before the Commission several times and, of course, we welcome him back again today.

Toshi Yoshihara is Chair of Asia-Pacific Studies at the U.S. Naval War College, where his recent research focuses on the risks posed by China's modernizing missile forces to U.S. bases in Japan, as well as the potential for Japan to contribute to deterrence in Northeast Asia.

Dr. Yoshihara is the author or co-author of several volumes on maritime security and naval strategy. We also welcome him back as he once again testifies before the Commission.

Dennis Gormley is a rookie to the Commission, but we welcome you. He's a Senior Lecturer at the University of Pittsburgh where his teaching and research areas include missile proliferation, missile defense, and arms control.

Mr. Gormley has extensive experience in the intelligence community, private sector and think tank community.

So we want to welcome all three of you today. Thank you for being here.

The rules are we seek to limit oral remarks to seven minutes, but if you go over, that will be okay as well. But that's our aspiration--seven minutes. So, Mr. Stokes, why don't we start with you?

**OPENING STATEMENT OF MARK STOKES  
EXECUTIVE DIRECTOR, PROJECT 2049 INSTITUTE**

MR. STOKES: First, co-chairmen, it's an honor to be here today to make a presentation before the U.S.-China Economic and Security Commission and to testify alongside two esteemed colleagues here.

It's a good thing to be talking about one of my favorite subjects that I've focused on for quite awhile. What I'll do is divide my remarks into three areas--talk a bit about drivers, talk a bit about the research development, acquisition, infrastructure, and then again about the operational infrastructure.

From time to time I'm asked to comment whether it's in presentations on sort of inherent weaknesses, weaknesses and strengths of the United States and the People's Republic of China, PLA, in particular, and usually my answer is relatively simple. You focus on capabilities for which PLA is well-organized, and well-resourced, and capabilities that the United States just doesn't have, and it really boils down to two.

One, of course, is the subject of the hearing today, which is conventional land-based ballistic and land-attack cruise missiles. I say land-based--very important. And the second is the political warfare, influence operations with the General Political Department and Liaison Department. These are just two capabilities that we just don't have in our inventory. We've had them in the past, but since 1991 just haven't had, for example, land-based missiles with ranges between 500 kilometers and 5,500 kilometers, due to the INF Treaty, which is going to be a theme a bit in my presentation here.

But starting off is why did the PLA develop the type of force infrastructure that it has today in the area of conventional ballistic and land-attack cruise missiles? And to address this, I'm going to go a little bit out of order in terms of what's in my written statement and look a bit about history about how it began.

It began actually shortly after, with the economic reforms that took place after 1979, when Deng Xiaoping basically suggested that the defense industry begin to develop alternative sources of income, which it had been leveraging some of the advances that had taken place in solid rocket motor technology with the DF-21 program that had begun actually in the 1960s, but by the early 1980s had achieved some successes in terms of tests. Bear in mind these are nuclear capable DF-21s from the first generation.

So with advances in solid motor technology, two competing organizations--today that would be within the China Aerospace Science and Industry Corporation, 066 base, to be exact, in Hubei Province, and the second would be, was today China Aerospace Science and Technology Corporation First Academy, or China Academy of Launch Technology that developed short-range ballistic missiles for export, properly known, DF-15, DF-11, or by the export designations, the M-11--I'm sorry--let's just stick with the Chinese designations to make it simple.

And so in the beginning, they're export oriented. Then you had pressure that was put on China to be able to bring in, find some controls over the sale of missile and missile-related technology that evolved into what today is the Missile Control Technology Regime, and so dialogues to be able to bring China into the fold.

Now the two industrial entities' space and missile industry also began to market their products to the People's Liberation Army, Second Artillery, in particular, which was met with some resistance. But by, let's say, 1987, 1988, things changed a bit, in large part, due to some concerns from the PLA's perspective, concerns over democratization on Taiwan and the passing of former Republic of China, or Taiwan, President Chiang Ching-Kua, in terms of the direction they were taking.

And so finally the other sort of context for this was the signing of the INF Treaty in December 1987 in which both the United States and former Soviet Union embarked upon a program to dismantle their ground-based missile forces with ranges between 500 and 5,500 kilometers. So in this context, around summer of 1988, there's a Central Military Commission decision to go ahead and proceed with an R&D program to adapt some of these missiles developed for export and integrate them into the active force.

By 1991, which by the way is the same year in which both signatories to the INF Treaty became compliant in terms of dismantling these missile forces, began, made a decision to go ahead and develop these capabilities.

Bear in mind the INF Treaty really, in effect, was a recognition by both Moscow and Washington that offensive conventional missiles--it doesn't matter conventional or nuclear--with capabilities within those theater ranges were fundamentally destabilizing because of the difficulty in intercepting them and the necessary requirement to actually take the fight to the other side for interdiction on the ground, in other words, instead of air and naval forces, which theoretically could be countered off the surface on the other side, at least in large part, missiles considered to be somewhat destabilizing.

By 1991, the establishment of the First Operational Test and Evaluation Unit for the DF-15, also known as the "seed unit," and then by 1993, the Operational Test and Evaluation Unit was upgraded to a brigade based in Leping. Around this timeframe, I was in Beijing as a assistant air Attache and I remember open source materials indicated that they were going to be adopting solid fuel ballistic missiles for conventional use.

The first reaction was somewhat of a state of disbelief that the PLA could achieve the necessary accuracy requirements to be able to field a conventional capability that would be viable and more than just as sort of an instrument of terror.

But the first operational test of this capability was a form of deterrence or coercion in the lead up to--in the summer of 1995 and then in the lead-up to the first direct presidential election in 1996, off the coast of the two major ports of Taiwan, south Kaohsiung, north Keelung, off the coast, as a key type of political warfare, political message, directed not just against the population of Taiwan but also against other governments, including the United States, that oversee support of the democratic process.

So that's sort of the background, and to say that a major driver for the conventional missile forces is not just pure military, not pure operational, but it's an instrument of psychological intimidation for the people, to put in the minds of Taiwan's population that they're within seven minutes of destruction--the president is in particular.

And so that's somewhat of the background to be able to, in terms of the political background. Of course, another one is to be able to undermine and reduce confidence in U.S. commitments under the Taiwan Relations Act as well as other treaty commitments as well, to reduce confidence in U.S. ability to actually fulfil some of those obligations from an operational perspective, and, of course, the propaganda system very much sort of plays into some of those fears.

The operational drivers for conventional ballistic missiles have been fairly well established. One of the main drivers, of course, is, for suppression of enemy air defenses, to be able to go against whatever missile defenses could exist at the time or could exist in the future.

Of course, also to go after port facilities, for example, interdiction, in effect. And so that then--the other two speakers will probably will go a little bit more in the operational detail, and I have as well in the written statement.

To talk a bit about the R&D infrastructure--again, that's in the paper--but the main point/takeaway is that it's an incremental approach. When they have a system that goes into full rate, at least low rate initial production, odds are, which one can expect, is there's already a generation after next that's entering into preliminary research, and probably another system that will, that if it hasn't already, will shortly be entering into engineering R&D. It's a major decision to enter into R&D, one that's made jointly between the Central Military Commission and State Council.

At the same time, when they enter into engineering R&D, there will be establishment, if it's a brand new system, establishing an operational test and evaluation unit, or seed unit, for short. This has been the case with the initial, the initial development, for example, the DF-31, with the DF-15, the DF-11A, which is the 600 kilometer variant. And I surmise also, for example, with the DF-21D, anti-ship ballistic missile, and the future, for example, with conventional intermediate-range ballistic missile, as well. Odds are if they're already testing the system, there's a brigade in place somewhere out there.

Whether or not it's a brand new brigade or whether or not it's a brigade that will be converting to a new missile variant over time, there probably is one that's already in existence.

In terms of operational infrastructure, the way to look at it, and I could use a map, but probably can just give a general sense of sort of the infrastructure, Second Artillery is divided up into six missile bases, which are corps leader level organizations.

A base is not a physical one particular location, but it's an organizational structure and commanded by the political commissar of a particular base is the head of the Political Committee of that particular unit, which is responsible for policy, and then the commander would be the deputy of that Political Committee overseeing that organization.

The 52 base is the one that has the bulk of the conventional missiles, consisting of at least six brigades. A brigade, of course, will have six battalions underneath and the conventional force six battalions that have launch vehicles each.

These are peacetime organizations. In a wartime situation or a contingency situation, the peacetime organization selected brigades under, for example, 52 base or perhaps 53 base or perhaps 51 base, which is up in northeast China, selected--they would take certain brigades and then reassign them to the operational command.

The reason why this is relevant is that this command, for example, a joint campaign command, which is sort of a theater level that would be responsible for conducting operations, does not appear to be overlap with the nuclear command and control system, which notionally would not come under a separate organization that would be a nuclear.

That's an important question in terms of the overlap between the nuclear and the conventional structure in a wartime situation because that then, of course, the natural, as with the INF Treaty, the natural tendency is to be able to--the main best defense against this type of missile system is deep interdiction.

So I'll leave it there and then address questions afterward. Thank you.

**PREPARED STATEMENT OF MARK STOKES  
EXECUTIVE DIRECTOR, PROJECT 2049 INSTITUTE**

**Prepared Statement of  
Mark A. Stokes  
Executive Director  
Project 2049 Institute  
Before  
The U.S.-China Economic and Security Review Commission**

**Hearing on China's Offensive Missile Forces**

**Wednesday, April 1, 2015  
Room SD-562  
Dirksen Senate Office Building  
Washington, DC**

Mr. Chairman, thank you for the opportunity to participate in today's hearing on an issue that is important to U.S. interests in peace and stability in the Asia-Pacific region. It is an honor to testify here today. The evolving capacity of the People's Republic of China (PRC) to use military force presents a number of challenges for the United States, allies, and friends in the Asia-Pacific region. In my presentation this morning, I will address PRC investment into conventional missile forces and offer a basic outline of its research, development, and acquisition system.

The People's Liberation Army (PLA) is rapidly advancing its capacity to integrate sensors and long range precision strike assets in order to advance the legitimacy of the Chinese Communist Party (CCP), and defend against perceived threats to national sovereignty and territorial integrity. The PLA relies on the Second Artillery Force for achieving strategic effects through direct targeting of enemy centers of gravity. Ballistic missiles capable of delivering conventional payloads with precision have a coercive effect on neighbors with limited countermeasures. Real or latent missile capabilities can be amplified or attenuated through well-organized and resourced political influence operations.

Until the fall of Soviet Union in 1991, the Second Artillery's mission was limited to blunt instruments of mass destruction. Since 1991, the Second Artillery conventional missile force has become central to PLA warfighting. Ballistic and extended range cruise missiles are an attractive means of delivering lethal payloads due to the difficulties in defending against them in flight. Firepower delivered directly against critical nodes within an opponent's operational system allows conventional air, naval, and ground operations to be carried out at reduced risk and cost. Control of the skies enables dominance on the surface below. With Second Artillery firepower support, Air Force and Navy assets may gain and maintain the air superiority needed to coerce political concessions or gain a decisive edge on the surface.

The Second Artillery's conventional reach is gradually extending throughout the Asia-Pacific region as it expands its brigade infrastructure and introduces increasingly sophisticated missile systems into the inventory. Use of force against Taiwan has been the principle illustrative planning scenario guiding PLA and Second Artillery force modernization. Enjoying the broadest support within the CCP Central Committee and Central Military Commission (CMC), a Taiwan scenario allows the PLA to modernize its forces without precipitating neighbors to invest significant additional resources into deterrents and defenses. Over time and with an industrial surge, the same coercive military capabilities focused on

Taiwan could be directed against South Korea, Japan, Philippines, Vietnam, Singapore, Australia, Thailand, India, and others in the region. The Second Artillery and support defense industrial designers appear to be considering a phased approach to fielding increasingly long range conventional precision strike systems that could have global reach by 2030.

Emerging PLA anti-access/area denial (A2/AD) capabilities may complicate U.S. ability to operate in the region. Anti-access threats, designed to prevent an opposing force from entering an operational area, include long-range precision strike systems that could be employed against bases and moving targets at sea, such as aircraft carrier battle groups. Area denial involves shorter-range actions and capabilities designed to complicate an opposing force's freedom of action. Extended range conventional precision strike assets could suppress U.S. operations from forward bases in Japan, from U.S. aircraft battle groups operating in the Western Pacific, and perhaps over the next five to 10 years from U.S. bases on Guam. The Second Artillery also appears to have developed and deployed an initial capability to strike moving targets at sea, such as aircraft carriers and destroyers.

The perceived capacity to complicate U.S. operations within the region reduces confidence in the U.S. commitment to the Taiwan Relations Act (TRA) and other security obligations. As a result, U.S. allies and *ad hoc* coalition partners in the region may eventually face a dilemma: invest more resources into counterstrike systems or adopt conciliatory policies under increasingly coerced conditions. For deterrence and defense, especially in a Taiwan scenario, defenders *require* the means to strike single points of failure within the battlespace from which PLA offensive missile operations are being launched. Like any military organization, a PLA joint theater command and Second Artillery corps are operational systems, and ones that are increasingly complex. Like any operational system, the Second Artillery has single points of failure.

## Drivers

First, long range precision strike capabilities – ballistic missiles in particular – support the CCP's quest for political legitimacy. The PLA functions as the armed wing of the CCP, and the Second Artillery is the party's instrument for achieving strategic effects through direct targeting of enemy centers of gravity. The most immediate challenge to CCP domestic and international legitimacy is the Republic of China (ROC; or Taiwan). Because Taiwan's democratic system of government – an alternative to mainland China's authoritarian model – presents an existential challenge to the CCP, the PLA continues to rely on military coercion to compel concessions on sovereignty.

A second driver is operational in nature. Constrained by a relatively underdeveloped aviation establishment, the PLA is investing in capabilities that may offset shortcomings in the face of a more technologically advanced adversary. Basic Chinese operational theory is founded upon the notion that unimpeded access to skies over a region not only enables operational success on the surface. Theater missiles, defined as conventional ballistic and land attack cruise missiles (LACMs) with ranges between 500 and 5500 kilometers, create a more permissive environment for PLA Air Force (PLAAF) and Navy operations.

Among all PLA services and branches, the Second Artillery best understands the art of nodal analysis, strategic targeting, and effects-based operations, competencies that are traditionally enjoyed by air forces. The PLAAF appears to be still in the early stages of transforming from a defense counter-air mission toward an offensive interdiction orientation. To date, PLA conventional air platforms have been insufficient by themselves to suppress air defenses, conduct strategic strike missions, or gain air superiority around the Chinese periphery. Increasingly accurate conventional ballistic and LACMs are the optimal means for suppressing enemy air defense and creating a more permissive environment for subsequent conventional air operations due to their relative immunity to defense systems.

Conventional long range precision strike systems also could enable political leaders in Beijing to apply effective military measures to enforce territorial claims in the western Pacific Ocean. Theater missiles, including those adapted for the maritime environment, could enable precise targeting of Japanese or other naval combatants with few defenses. An extended range strike capability would allow China to defend its interests in other parts of the world, including assured access to energy resources transiting through the Straits of Malacca and perhaps even the Indian Ocean.

Missile strike operations also are viewed as a vital element of territorial air defense, with missiles intended to suppress adversary strike capabilities at their source. Along these lines, the Second Artillery is central to the PLA's strategy of complicating the ability of the United States to project global power and operate freely within the Asia-Pacific region. As strategic analyst Andrew Krepinevich observes, "since the Taiwan Strait crisis of 1996...China has moved to shift the military balance in the Western Pacific in its favor by fielding systems capable of driving up the cost of U.S. military access to the region to prohibitive levels." Theater missiles are essential for anti-access and area denial capabilities. Over time, conventional strikes against critical infrastructure in the continental United States, such as space-related ground stations, could further complicate military operations.

### **Research, Development, and Acquisition**

The Second Artillery is responsible for missile force planning and development of operational and technical requirements that are validated by the Central Military Commission (CMC) and the State Council. The Second Artillery Equipment Department probably develops short (e.g., five year) to long term (e.g., 15 or more years) plans and manages acquisition programs. Equipment Department leaders are supported by the Second Artillery Equipment Research Academy. Established in December 2003, the academy integrated four previously independent research institutes consisting of 36 labs. Since that time, the academy has expanded to seven research institutes. Acquisition program managers likely oversee industrial engineering R&D, and Second Artillery industrial representative offices ensure quality control.

A Second Artillery operational test and evaluation (OT&E) unit often is established after a CMC/State Council decision to invest in engineering R&D. The unit facilitates the introduction of a new capability into the operational inventory. An OT&E unit familiarizes itself with the civilian design team, industrial supply chain, and final assembly plant. Members of the unit presumably are supported by Second Artillery Equipment Department representative offices embedded with civilian defense industrial design departments, research institutes, and factories.

An OT&E unit plays a critical role in the flight testing that culminates in final CMC/State Council certification of the design and approval to begin low rate initial production. The OT&E team is assigned a military unit cover designation (MUCD) and sometimes temporarily collocated with an existing missile launch brigade. Upon design finalization, the unit appears to transition to brigade status and settle in to its permanent facilities. One or more battalions may initially be equipped with a launcher and deploy to northwest China for initial live fire testing and/or field training. The brigade may also refine equipment maintenance procedures and modify training simulators initially developed by the OT&E team. Over the course of two-three years after its establishment, the brigade may be expected to fill out a full contingent of six battalions and attain a full operational capability.

Two large state-owned enterprises – the China Aerospace Science and Industry Corporation (CASIC) and China Aerospace Science and Technology Corporation (CASC) – design, develop, and manufacture missile systems for the Second Artillery based on general policies established by GAD. While maintaining a long term perspective, force planners and defense industry rely on conservative, incremental upgrades to existing missile variants. Based on CMC/State Council planning, programming,



and budget guidance, engineering R&D may consist of four phases. A phased approach calls for multiple variants of the same basic missile system to be in the R&D cycle at any one time.

Basic guidelines for China's space and missile R&D strategy were established in the 1960s and entail a phased approach involving three variants of a system to be in each phase of the R&D cycle at any one time. This incremental approach offers some basis for assessing possible future capabilities, keeping in mind the potential for leapfrog advances. Guided by CMC-approved general planning, programming, and budget guidance, R&D may consist of four phases.

- *Preliminary research* is focused on initial development of key technologies applicable to multiple programs and could reduce engineering R&D time and risk. The GAD Integrated Planning Department's Preliminary Research Bureau and a similar organization within the Second Artillery Equipment Department function as important supervisory bodies for funded projects in this phase.
- During the *concept development and program validation phase*, the Second Artillery, working in conjunction with defense industry, identifies key technologies and assesses alternatives that could meet basic operational and technical requirements. A capstone document used as the basis for a final decision to invest in engineering R&D is referred to as the Tactics and Technology Index.
- During the *engineering R&D phase*, programs are managed through a dual command system that divides administration and technical responsibilities. A research academy within one of two state owned enterprises – China Aerospace Science and Technology Corporation (CASC) and China Aerospace Science and Industry Corporation (CASIC) – assumes a lead systems integration role. Administrative responsibilities reside with a program manager, while technical aspects of a program are the responsibility of the chief designer and his/her design team. The program manager ensures timeliness, controls quality, schedules testing, and manages the program budget. Members of the technical design team appear to have concurrent positions within an academy's design department and research institutes. The design team most likely is organized in accordance with the work breakdown structure outlined in approved R&D guidelines and research academy's contract with the PLA user.
- During the *design finalization phase*, end users and industrial program managers evaluate whether or not a design satisfies operational and technical requirements. Ground and flight tests at specified ranges are carried out and evaluated in accordance with operational and technical requirements, including the Tactics and Technology Index, General Missile System R&D Requirements, and R&D Mission Document. After successfully completing flight testing, the system is reviewed by a design finalization board. The program management team produces a systems R&D report for review by a senior-level Second Artillery Design Finalization Committee. If approved, the system is reviewed by a first level Design Finalization Committee comprised of members of the State Council (Premier or Vice Premier) and CMC. A joint CMC-State Council standing office appears to support the first level design certification committee.

### **Operational Infrastructure: Past as Prologue**

Since deployment of its first ballistic missile in the 1960s, the PLA and China's space and missile industry have sought greater range, survivability, accuracy, and effectiveness against a broader range of

targets. Based on an incremental approach to R&D, production, and operational test and evaluation, the PLA is gradually extending and diversifying the warfighting capacity of the Second Artillery's ballistic missile force as a core element of its regional political-military strategy. Space-based, airborne, and ground-based sensors can facilitate command and control, and provide crucial strategic intelligence, theater awareness, targeting, and battle damage assessment information. Authoritative Chinese writings indicate research into, and development of, increasingly accurate and longer range conventional strategic strike systems that could be launched from Chinese territory against land and sea-based targets throughout the Asia-Pacific region in a crisis situation. The PLA may have a long term, phased approach for development of a conventional global precision strike capability.

Leveraging the vacuum created by the signing of the U.S.-Soviet Intermediate Nuclear Forces (INF) Treaty in December 1987, Taiwan's democratic transformation has been the principle driver for the PLA's conventional missile force buildup. The PLA had already achieved some success in solid rocket motor technology and its first solid-fueled ballistic missile – the DF-21 – in the early 1980s. A reduction in tensions across the Taiwan Strait after the U.S. switched diplomatic recognition from the ROC to the PRC enabled a reduction in PLA force posture opposite Taiwan, and reduction in defense spending. China's political leadership increasingly turned its attention toward economic development. Encouraged to enter the export market to offset declining domestic demand for defense production, the space and missile industry began formal R&D on a short range ballistic missile (SRBM) -- the DF-15 -- in April 1985. Active international marketing began in November 1986, when the missile was displayed during a defense exhibition in Beijing. The space and missile industry concluded an agreement for the sale of the M-9 to Syria in early 1988 before flight testing and design finalization. CASIC's 066 Base in Hubei also entered the competition and began development of a 300 kilometer range DF-11 (export designation: M-11) solid fueled ballistic missile in 1985.

By the latter part of the decade, however, the CMC began serious consideration of integrating conventional ballistic missiles into the active PLA inventory. U.S. and Soviet arms control initiatives opened a window for the PLA to gain a strategic advantage. With a large arsenal of 600 kilometer range ballistic missiles, China would soon have a military capability no one else in the world possessed. After long negotiations, the former Soviet Union and United States concluded the INF Treaty in December 1987. The INF Treaty required both sides to eliminate all land-based ballistic and cruise missiles with ranges of between 500 and 5500 kilometers, including the assets the Soviets had deployed in the Far East.

At the same time, ROC President Chiang Ching-kuo's lifting of martial law and legalization of opposition parties in 1987 and his subsequent passing in January 1988 prompted CCP concerns. Chiang's anointed successor, Lee Teng-hui, was a native Taiwanese without the emotional attachment to Chinese nationalism shared by his predecessors. Viewing Taiwan's gradual democratization an existential threat to CCP legitimacy, more active measures were required to coerce Taiwan's political leadership into unification under the CCP's "One Country, Two Systems" framework.

Beyond Taiwan-specific considerations, international pressure on the PRC to sign on to the Missile Technology Control Regime (MTCR) threatened revenue sources for China's defense industrial base. The space and missile industry began lobbying the PLA to adopt a conventional ballistic missile capability, arguing that improvements in accuracy would make the systems militarily viable.

After the successful initial test of the DF-15 SRBM in June 1988, the CMC approved a plan to establish a conventional missile force opposite Taiwan. With a 1988 decision to deploy ballistic missiles in a conventional role, the PLA's SRBM build-up opposite Taiwan began with establishment of a seed unit on August 1, 1991. Under the leadership of then Lieutenant Colonel Gao Jin (now commandant of the PLA Academy of Military Sciences), the team worked in coordination with the aerospace industry in the finalized design, certification, and operational test and evaluation of the new missile system. Final DF-15

acceptance testing took place in August 1992, and the Leping brigade's first operational test launch of a missile took place on November 23, 1993. Formation of the unit coincided with acquisition of new fighters from the former Soviet Union, and initiation of cross-Strait negotiations. Note that the CMC decision to establish the first SRBM brigade opposite Taiwan and procurement of Soviet Su-27s *preceded* U.S. release of F-16s in September 1992.

With the successful performance of the initial SRBM brigade, plans to fill out a larger infrastructure opposite Taiwan. The Leping "seed unit" produced a cadre of capable engineers familiar with forming new brigades equipped with sophisticated missile systems. With the DF-15 system securely deployed in Leping, active planning began to form the initial unit to be equipped with a longer range variant of the DF-11 missile. The original 300km variant had been successfully flight tested in 1990, with initial intent for sale to Pakistan in early 1991.

In the wake of a 1993 CMC decision, Base 066 in Hubei Province began work on an extended range variant – the DF-11A – with the goal of doubling the range without a compromise in accuracy. Coinciding with initial ground tests, the Second Artillery command directed the establishment of a new seed unit in 1995, drawing on nine junior and field grade officers, some from the Leping brigade. The unit began its formal work in 1997. Initially collocated with the Leping brigade, the second SRBM brigade moved to its permanent garrison location near the Fujian city of Yong'an in late 1999 or early 2000. Final acceptance of the missile took place in August 1999.

As the second SRBM was being formed, the Leping brigade applied its missiles in a real world coercive exercise. In July 1995, the CMC directed the Second Artillery to launch four missiles into the waters adjacent to Taiwan's two primary harbors, Kaohsiung and Keelung. Six months later, the *New York Times* reported explicit Chinese threats to conduct follow-on ballistic missile exercise strikes in order to deter perceived moves toward *de jure* independence by then-KMT President Lee Teng-hui and send a signal of Chinese displeasure to the international community. While many in Beijing appear convinced that the missiles were politically effective, others acknowledged that the exercises sparked worldwide anti-China sentiment, strengthened U.S. alliances in the region, re-invigorated the U.S.-Taiwan defense relationship, and hardened U.S. resolve to intervene in any future use of force against Taiwan.

Over the following five years, the PLA proceeded to fill out a remaining four conventional brigades distributed across three provinces in southeast China. Following full operational capability of the DF-11A, work proceeded in 2001 to establish the third SRBM brigade – probably the second to be equipped with the DF-11A --in eastern Guangdong Province. After three years, the new brigade near Meizhou appeared to have been fully equipped. At the same time, another brigade was established near the southern Jiangxi city of Ganzhou. Most likely equipped with a DF-15 variant, the brigade was noted in its first training exercise in 2005. Another brigade was garrisoned in the area of Jinhua, Zhejiang Province and appeared to be fully operational by the 2005 timeframe. The brigade commander was an original member of the initial SRBM seed unit in the early 1990s.

Subsequent to filling out the Meizhou, Ganzhou, and Jinhua launch brigades, the Second Artillery established a seed unit for another conventional brigade in 2006. Initially collocated with an existing DF-21 brigade in the Anhui city of Chizhou, *Xinhua*-affiliated media reporting of unknown reliability indicates the unit, assigned an external designation of 96166, transitioned to permanent facilities in Shaoguan, the northern-most municipality in Guangdong Province in late 2010. A Second Artillery unit known to be responsible for tunneling work under the so-call "Great Wall Project" had a presence in Shaoguan since at least as early as 2008. The unit leverages the city's location along major transportation arteries and tunneling through the Nanling Mountains that divide Guangdong and Hunan provinces. Although unconfirmed, the new brigade may be equipped with a new missile type, such as the 1000 kilometer range DF-16 MRBM. Coinciding with establishment of the Shaoguan brigade, the CMC in late

2010 also resubordinated an SRBM unit near Putian, Fujian Province (1st Missile Brigade; 73661 Unit) that had been under command of the Nanjing Military Region to the Second Artillery 52 Base.

As its SRBM force was being filled out, Second Artillery planners entered a second phase that sought to extend the range of the Second Artillery's missile force and field a rudimentary ability to strike targets on land and moving targets at sea out to 1,500 to 2,000 kilometers. The centerpiece of the Second Artillery's extended range conventional strike capability is the DF-21C MRBM, and its maritime variant the DF-21D ASBM. Launched from positions near permanent garrisons, these systems could be used for conventional strikes against targets throughout Japan, northern India, Southeast Asia, and the Western Pacific Ocean and South China Sea. The terminally-guided DF-21C can deliver a 2000 kilogram warhead to a range of at least 1750 kilometers with a circular error probability (CEP) of less than 50 meters.

The Second Artillery has an operational force structure of at least five brigades equipped with a DF-21 variant. Trends indicate that some brigades equipped with DF-21A systems may have converted to a DF-31 variant, or perhaps to a conventional DF-21 variant. Standard DF-21C force structure appears to mirror that of SRBM brigades, with each brigade having six launch battalions with one or two companies each. Assuming a single launcher is assigned to each company, a DF-21C brigade could be initially equipped with 12 launchers. With conventionally-capable MRBM brigades equipped with a minimal 12 launchers, current operational effectiveness against targets in Japan, India, and elsewhere in the region may be limited. However, China's defense industrial and operational infrastructure indicates significant capacity for growth, with capacity for MRBM production having doubled. Existing brigades deployed in southeast China and currently equipped with SRBMs may convert to extended range MRBMs in the future. In addition, it is possible that subordinate battalions within at least one DF-21 unit could adopt a secondary space intercept mission.

Many of the basic technologies needed for a rudimentary maritime variant – the DF-21D ASBM -- have been in development for more than 20 years. At the core of this capability is an advanced missile-borne sensing and data processing system supported by strategic cueing from a dual-use maritime surveillance network. An OT&E unit may have been established as early as 2006, and attached to a DF-21 brigade in Yunnan province. Manufacturing facilities for solid rocket motors associated with the DF-21D appear to have been completed in 2009, followed by ground testing of the new motor and full range flight testing. The unit, which is subordinate to Base 53, moved to permanent garrison facilities in northern Guangdong province in the 2010 timeframe. The possible ASBM brigade appears to have conducted its first mobility exercise at an unspecified joint training center in early Spring 2011. China's space and missile industry has been analyzing alternatives to extend the range of the ASBM while maintaining precision.

An extended range SRBM variant (or MRBM), perhaps designated as the DF-16, could bridge the range between the SRBMs and the DF-21C/D. The CASC First Academy completed conceptual design flight tests for a two-staged conventional ballistic missile that remained within the atmosphere by the end of 2010.

In addition to MRBMs, Second Artillery is steadily expanding its LACM infrastructure. Able to penetrate defenses and strike critical targets on land, out to a range of at least 2000 kilometers, Second Artillery LACMs appear to have enjoyed a relatively high acquisition priority. LACMs are powerful instruments of military and political utility due to the inherent difficulty in defending against them. Since successful completion of operational testing in October 2003, the PLA's inventory of ground launched cruise missiles has expanded significantly. Approximately 100 LACMs enter into the operational inventory each year. Based in south-central and southwest China, two or possibly three Second Artillery GLCM brigades would be able to rapidly forward deploy in a crisis situation. Some indications exist that a submarine launch ground attack cruise missile could be in development as well, as well as an extended range LACM

variant.

A third phase may extend these conventional precision strike capabilities out to a range of 3,000 kilometers and beyond. An initial capability could be available by the conclusion of the 12<sup>th</sup> Five Year Plan in 2015. At least one centerpiece is development of a conventionally-capable intermediate range missile (IRBM) system, possibly designated the DF-26. Supported by an expanding persistent surveillance architecture, the driving requirement may be suppression of air operations from Andersen AFB on Guam. A 3000-4000km range conventional system could also range targets throughout Southeast and South Asia.

Important technologies possibly applicable to multiple launch vehicles include more advanced solid motors and post-boost vehicles that adopt a “boost-glide” trajectory as a means of complicating mid-course missile defenses and extending operational range. A missile would be launched that would release a post-boost vehicle to glide and maneuver toward the intended target. Instead of flying a minimal energy ballistic flight path that takes the missile into space before returning to earth, the boost-glide missile skips in and out of near space, those altitudes between 20 and 100 kilometers. Aerodynamically configured to glide toward its target, the flight vehicle adopts hybrid characteristics of both ballistic and cruise missiles. In addition to complicating mid-course missile defenses, boost glide flight vehicles are said to extend the range of existing ballistic missiles. One study, for example, asserts that a basic boost-glide capability could extend the range of a missile by 31.2%.

A final phase may envision a global precision strike capability by 2030. Chinese industry publications indicate interests in leveraging a boost-glide capability in order to achieve global reach, similar to that carried out under the United States’ Prompt Global Strike program. The CASC First Academy, CASIC Third Academy and PLA designers have conducted feasibility studies of global post boost vehicles, and appear to believe China could overcome the technical obstacles to fielding such a system. In one study, CASC designers identified 10 key technologies needed for global precision strike.

During peacetime, conventional ballistic missile brigades are administratively subordinate to at least three corps leader (or corps deputy leader) grade entities—Base 51 (headquartered in Shenyang), Base 52 (headquartered in Huangshan), and Base 53 (headquartered in Kunming). Base 55 (headquartered in Huaihua) oversees a LACM brigade as well. Base 52 oversees the majority of these conventionally-capable missile brigades, which are capable of striking Taiwan from areas adjacent to their home garrisons. Selected conventionally-capable ballistic and land attack cruise missile brigades and support regiments, which are under direct authority of the Second Artillery corps-level bases during peacetime (eg., rather than military regions), may be allocated to a Joint Campaign Command that the CMC would establish in a contingency. The CMC chairman can be expected to retain exclusive control over the allocation of nuclear warheads through the PLA’s central warhead storage and handling complex (known as Base 22), which is headquartered deep in Shaanxi’s Qinling Mountains. The nuclear command and control system most likely would be separate and distinct from that of the Joint Campaign Command system.

## **Concluding Remarks**

The PLA’s growing interdiction capabilities, often referred to as anti-access/area denial (A2/AD), not only could complicate U.S. ability to operate in the Asia-Pacific region, but also give the PLA a decisive edge in securing control over the skies around its periphery should territorial disputes erupt into conflict. A conventional global strike capability would allow the PLA to reach targets deep inside continental United States territory without relying on forward bases. The PLA’s growing capacity for long range precision strike provides an incentive for neighbors to shore up defenses and develop similar strike capabilities. The most effective and efficient means of defending against theater missiles is neutralizing

the missile infrastructure on the ground.

The Second Artillery is expanding its infrastructure and developing an increasingly complex operational system that could give the PLA a decisive edge in securing control over the skies around its periphery should territorial disputes erupt into conflict. The ability to dominate the airspace over a given geographic domain has the potential to create instability should political disagreements flare. The more confident that a regime is of military success, the greater the chance that force could be assertively applied in pursuit of political demands. Balance and stability require that no one single power be assured of air superiority.

A strategic shift in regional aerospace balance also may increasingly unravel the fabric of U.S. alliances and prompt allies and friends to consider of weapons of mass destruction and means of delivery as a means of security. The most effective and efficient means of defending against theater missiles is neutralizing the missile infrastructure on the ground. The PLA's expanding conventional missile capabilities are influencing the development of similar capabilities in other defense establishments, including the United States. In the absence of a common set of norms governing the horizontal and vertical proliferation of ballistic and ground-launched cruise missiles, countries throughout the region are by necessity increasing investment into long range precision strike systems in order to maintain a conventional deterrent and ensure effective defense should deterrence fail.

Alternative approaches could seek initiatives to moderate Second Artillery's force posture and address underlying security dilemmas through cooperative threat reduction programs. A conventional global strike capability risks escalation since an adversary may misinterpret the launch of a missile with conventional warheads and conclude that the missiles carry nuclear weapons.

Demonstrated coercive value of the world's largest and most sophisticated arsenal of medium and intermediate range ballistic missiles creates a demand for similar capabilities around the world. Second Artillery successes in fielding advanced long range precision strike systems dilutes international efforts to stem proliferation of the means of delivery for weapons of mass destruction. This may encourage other countries to follow suit, especially as China's global leadership and standing increases.

Ballistic and ground-launched cruise missiles have long been of sufficient concern to warrant international agreements to limit their horizontal and vertical proliferation. The Missile Technology Control Regime (MTCR) and Hague Code of Conduct against Ballistic Missile Proliferation (HCOC) have both intended to stem the proliferation of unmanned delivery systems capable of delivering weapons of mass destruction.

In light of Russia's threats for withdrawal, partially due to the global proliferation of short and medium range ballistic and ground launched cruise missiles, the CCP's selection of these systems to defend its party legitimacy and coerce resolution of sovereignty and territorial claims could also undermine one of the most successful and enduring arms control agreements to date – the INF Treaty. The 1987 INF Treaty led to elimination of U.S. and former Soviet land-based ballistic and cruise missiles with ranges of between 500 and 5500 kilometers. In 2007, senior Russian officials announced a possible withdrawal from the INF Treaty unless implemented on a global basis. Opinion leaders in Moscow cited particular concern over the expansion of neighboring theater missile forces. A thorough review and modification of the INF Treaty may indeed be warranted, as well as possible alternative missile control regimes.

**OPENING STATEMENT OF TOSHI YOSHIHARA, PH.D.  
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DR. YOSHIHARA: Commissioners, thank you for this opportunity to speak to you about China's offensive missiles and their potential threat to U.S. bases in Japan.

This morning I'm going to briefly outline why China would target U.S. bases in Japan, how the PLA would employ its conventional missiles against U.S. bases in Japan, the possible operational and strategic effects of such missile attacks, and what the U.S.-Japan alliance should do in response.

First, why U.S. bases in Japan? Well, Chinese strategists express a sense of vulnerability to U.S. forward bases in Japan. There is a well-established history of U.S. intervention in Chinese affairs from U.S. bases in Japan. The most prominent example is the U.S. dispatch of USS Independence carrier battle group to the vicinity of Taiwan during the height of the Taiwan Strait crisis in 1996, and, of course, that carrier was homeported in Yokosuka Naval Base.

There is thus an expectation that in future contingencies, U.S. forces in Japan will again interfere. The United States also routinely conducts peacetime intelligence, surveillance and reconnaissance activities around China's periphery, many of them launched directly from Japan. This is something that the Chinese have objected to and in recent years have responded to with action.

At the same time, Chinese analysts understand the U.S. dependence on shore-based facilities to conduct operations in peacetime, crisis and war. Disruptions to base access would have knock-on effects on the ability of U.S. forces to operate in maritime Asia.

In sum, Chinese analysts see the bases as both a threat and an opportunity and therefore should be the objects of military action in times of crisis or war.

Secondly, how would the missiles be used? Chinese analysts see the missiles as weapons of first resort because those missiles can bypass fielded forces to directly attack allied basing vulnerabilities. The missiles would ease the burden on other Chinese front-line units like aircraft and ships that would have difficulty fulfilling some of the strike missions against distant targets at acceptable cost.

China possesses a family of conventional theater strike systems, including ballistic and cruise missiles, capable of hitting bases across the Japanese archipelago. It should be noted that it is not just U.S. bases in Japan that are vulnerable, but bases used exclusively by Japanese forces would be threatened too.

The combined use of ballistic and cruise missiles adds mass, shares the burden of striking different targets, and complicates the defense of the bases.

In the future, cruise missiles launched from submarines and ships would add to the mix of threats to U.S. bases in Japan, further complicating the task for the defender. But the Chinese understand that because missiles are essentially one-way weapons, they are a scarce commodity. Thus, they will likely use those missiles judiciously against targets in Japan, limiting the number of targeted bases until the force grows sufficiently large in the future.

Third, what are the possible effects of missile strikes? The missiles would disrupt the use of bases by allied military units already deployed there while barring U.S. reinforcements from other locations to those bases. China would, in effect, put up a contested zone across large parts of maritime Asia, severely hampering allied freedom of movement.

While successful attacks on bases in Japan would by no means constitute a war winner for Beijing, they would certainly complicate U.S. planning while magnifying the tyranny of distance inherent to air and fleet operations in the vast Pacific.

At the very least, doing harm to the region's basing infrastructure at the outset of conflict could help the PLA slow down or hold at bay U.S. and allied forces operating along the approaches to the Chinese mainland.

An effective suppression campaign against U.S. and Japanese naval and air bases could preclude a quick allied response to China's first military moves, degrade the capacity to contest the Chinese use of the air and the sea, disrupt the flow of U.S. reinforcements into the combat theater, and drive up the cost of sustaining follow-on military operations.

So, finally, what can be done about this? The steps I outline below are likely already familiar to you, but I will talk about these options in the context of what Japan can do in the coming years.

First, Japan should do more to harden its basing infrastructure. This would allow the alliance to absorb Chinese missile strikes and reduce the vulnerability of valuable assets like aircraft that could be caught and destroyed on the ground.

Second, Japan should prepare to disperse its forces. Japan enjoys superb and abundant civilian infrastructure, including airports and ports across the Japanese islands that could be used by allied forces in times of crisis and war. This would dilute China's confidence that it could disrupt allied operations by throwing the weight of its missiles against a small number of bases where high-value forces are concentrated.

Third, Japan could deploy counterforce units on the Ryukyu Islands. If you look on the map, the Ryukyu Islands are the string of islands located between the main island of Kyushu and Taiwan. Land-based anti-ship and anti-air forces could hold at risk Chinese military units operating over large parts of the East China Sea. If China chose to suppress these forces, the PLA would have to open up a new front, expend scarce resources to hunt for these Japanese defenders with questionable prospects for success and further drive up the costs of Chinese military campaigns.

And, finally, Japan should continue to invest in active defenses, including sea-based and land-based ballistic missile defense systems, as well as advanced air and cruise missile defenses.

The overall goal is to strengthen the allied capacity to withstand a Chinese strike, possibly a first strike, to recover, to retake the initiative, and to regain the command of the commons.

The alliance should demonstrate to China in peacetime that it cannot win quickly. China hopes to win a quick decisive victory. If China believes that it will likely be caught in a protracted war if deterrence fails, the prospects of a long protracted war would hopefully disincline China to act in the first place and thereby shoring up deterrence.

Thank you very much.



**PREPARED STATEMENT OF TOSHI YOSHIHARA, PH.D.  
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**Testimony before the U.S.-China Economic and Security Review Commission  
Hearing on “China’s Offensive Missile Forces”  
April 1, 2015**

Toshi Yoshihara  
John A. van Beuren Chair of Asia-Pacific Studies  
U.S. Naval War College

Japan is essential to U.S. military strategy in Asia. The Japanese archipelago is home to some of the largest and most important American forward bases in the world, enabling the United States to project power in the region and beyond. Japan’s world-class Self-Defense Force not only augments America’s strategic influence, but also shares the operational burdens of defending maritime Asia. As like-minded powers, Tokyo and Washington, D.C. attach enormous value to the norms and values that regulate the global order. For more than six decades, the U.S.-Japan alliance has presided over the region’s peace and prosperity so central to the integrity of the current international system.

But China’s rise, particularly in the military sphere, threatens to unsettle the U.S.-led status quo. During the past two decades, China has built up an array of military forces, including its conventional missile forces, designed to complicate and even preclude American and allied operations across large swathes of maritime Asia. Known as an “anti-access/area denial” strategy, Beijing seeks to hold the United States and its allies at bay in the event that China fights in a major regional conflict, such as a war over Taiwan.

China’s growing capacity to keep out third parties is challenging long-held assumptions that have underwritten the U.S. posture in Asia. In wartime, Chinese naval, air, and missiles forces would contest allied use of the seas, airspace, and bases in the western Pacific, including those located along the Japanese archipelago. There is strong evidence that China’s military, the People’s Liberation Army (PLA), is developing a missile arsenal targeted in part at bases in Japan, raising questions about the alliance’s ability to fight effectively should deterrence fail. The bottom line is that Washington can no longer take for granted unfettered access to U.S. bases across Japan in wartime. It is thus important to understand Chinese perceptions of Japan’s basing infrastructure and how China might seek to employ its missiles to preclude or degrade allied use of the air bases and naval facilities so essential to deterrence and warfighting.

*The Importance of U.S. Bases in Japan*

Japanese bases are the foundation of U.S. strategy in Asia. Japan’s proximity to potential flashpoints in Asia enhances allied deterrence while maximizing early warning, rapid crisis response, and wartime mobilization, should deterrence fail. Without Japan, the United States would lose an irreplaceable foothold from which to radiate combat power along the East Asian littoral. As one analyst notes, “The American military would be significantly less effective without access to these forward operating bases, and their loss could be the difference between victory and stalemate—or worse.”<sup>1</sup>

The Japanese archipelago hosts an unmatched share of U.S. combat power in Asia. Japan is home to roughly 50,000 American military personnel (about 38,000 ashore and 11,000 afloat), over eighty

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<sup>1</sup> Ian Easton, *China’s Evolving Reconnaissance Strike Capabilities: Implications for the U.S.-Japan Alliance* (Arlington, VA: Project 2049 Institute, February 2014), p. 18.

facilities under exclusive American control, the Seventh Fleet, the Fifth Air Force, and the III Marine Expeditionary Force.<sup>2</sup> Kadena Air Force Base is “the largest U.S. installation in the Asia-Pacific region” and deploys “the largest operational combat wing overseas in terms of the number of aircraft assigned.”<sup>3</sup> Yokosuka Naval Base supports the U.S. Navy’s only permanently forward-deployed aircraft carrier, USS *George Washington* (CVN 73), while the III Marine Expeditionary Force is the only division-sized fighting unit based outside of the United States.

### *Chinese Views of U.S. Bases in Japan*

Chinese strategists view U.S. bases in Japan as places from which the United States could intervene in Beijing’s affairs. Taiwan remains the animating force behind China’s strategic calculus. The PLA’s inability to respond to the display of U.S. naval power at the height of the 1996 Taiwan Strait crisis proved highly embarrassing. This galling experience steeled Beijing’s resolve to preclude U.S. naval deployments near Taiwan in a future crisis. Notably, the Yokosuka-based USS *Independence* (CV 62) took station off Taiwan’s east coast in March 1996, cementing Chinese expectations that Washington would dispatch a Japan-based carrier in a contingency over Taiwan.

Other territorial disputes along China’s nautical periphery could involve U.S. intervention. A military crisis arising from a Sino-Japanese encounter at sea over the Senkaku/Diaoyu Islands could compel an American reaction. Recent Chinese attempts to enforce territorial claims over large swathes of the South China Sea have stoked regional tensions. If a local tussle there escalated into a larger conflagration that threatened international shipping, the U.S. Navy might be ordered to maintain freedom of navigation. Chinese analysts anticipate that the U.S. carrier based in Japan and other strike groups operating near Asian waters could be called upon as first responders.

Beyond crisis or conflict, Chinese analysts are acutely sensitive to regular peacetime surveillance and reconnaissance activities along China’s periphery launched from Japan. They point out that RC-135 and EP-3E aircraft flying out of Misawa, Kadena, and Atsugi airbases can intercept signals emissions deep inside Chinese territory.<sup>4</sup> Notably, the EP-3 aircraft forced to land on Hainan Island following a collision in international airspace with a Chinese J-8 fighter in April 2001 was launched from Kadena.

Oceanographic survey ships and ocean surveillance vessels frequently operate out of U.S. naval bases in Japan, including the USNS *Impeccable* that Chinese vessels harassed in March 2009. The Chinese also pay close attention to the presence of F-22 stealth fighters and P-8 anti-submarine warfare aircraft on Kadena airbase, viewing these deployments as blunt deterrence signaling directed at China.<sup>5</sup> In August 2014, a Chinese Su-27 interceptor maneuvered dangerously near a P-8 conducting routine reconnaissance in international airspace over the East China Sea. The PLA is clearly pushing back against U.S. aircraft and ships originating from Japan.

At the operational level, Chinese analysts have carefully studied the extent to which U.S. global strategy rests on uninterrupted access to overseas bases. Indeed, they are well acquainted with the centrality of foreign naval bases to seagoing forces, especially those forces that must operate far from the homeland for extended periods of time.<sup>6</sup> Chinese strategists recognize that rear-area support from shore bases is indispensable to sustained combat operations of a modern carrier strike group. In peacetime, a carrier and its accompanying fleet consume massive quantities of fuel, food, ammunition, and spare parts while

<sup>2</sup> The U.S. personnel numbers are based on figures provided by *U.S. Forces Japan: Official Military Website*, [www.usfj.mil/](http://www.usfj.mil/).

<sup>3</sup> See <http://www.kadena.af.mil/main/welcome.asp>.

<sup>4</sup> Liu Zhipeng, et al., “Communications Electronic Warfare Currently Facing the Chinese Navy and Research on Countermeasures,” *Information and Communications*, No. 2 (2013), pp. 197-198.

<sup>5</sup> Wang Weiwei, “The Logic of Alliance Hegemony: Understanding U.S. Behavior in the Sino-Japanese Contest,” *Northeast Asia Forum*, No. 2 (2014), p. 94.

<sup>6</sup> Ou Yangwei, *On Strategic Deployment* (Beijing: Liberation Army Press, 2011), p. 38.

placing nearly continuous demands on maintenance and repairs facilities.

During high-intensity combat operations, carrier-based naval aviation units require constant resupply of munitions while the carrier and other surface combatants need to be rearmed and refueled regularly. The replenishment fleet must shuttle between the carrier strike group and a network of bases that store these supplies to sustain continuous cruises at sea. Structural repairs and the replacement of military components, such as aircraft engines, rely on the direct support of major bases.<sup>7</sup> The Chinese appreciate the dynamic and complex interaction between frontline formations and the shore-based infrastructure that supports their operations.

Chinese strategists see U.S. forward basing in Asia as both a threat to Chinese interests and a critical vulnerability for the United States. Bases in Japan are the most likely locations from which the United States would project power in response to a contingency involving China. At the same time, Chinese planners are acutely aware of the apparent American dependence on a few bases to influence events in the region. Should access to and use of these bases be denied for political or military reasons, they infer, Washington's ability to fulfill its responsibilities in Asia could quickly unravel. It is this keen awareness that has informed Chinese missile strategy against U.S. bases in Japan.

#### *Missiles: Weapons of First Resort*

The importance of bases in Japan to U.S. strategy and China's sense of vulnerability to those bases in war and peacetime constitute the essential strategic context to the Chinese missile threat. For some time to come, the missile will be China's best answer to U.S. forward presence, power projection, and security commitments to treaty allies and friends. The Second Artillery's missile force enables it to deliver firepower well beyond the mainland shores, projecting the kind of power that current Chinese air and naval forces cannot match. Moreover, authoritative doctrinal sources suggest that missiles may be the only available tool at the Chinese military's disposal to conduct long-range strike missions against distant and well-defended targets like those located in Japan. As the *Science of Second Artillery Campaigns* observes:

When the powerful enemy's allied military bases around our periphery are beyond our air arm's firing range,...thus making it difficult to carry out the overall operational advantages associated with firepower coordination among the armed services and service arms, conventional missiles can be used to implement harassment strikes against the military bases of the enemy's allies around our periphery.<sup>8</sup>

According to the latest edition of the *Science of Military Strategy*:

In joint operations, conventional missiles are mainly used to strike those [targets] that other types of weaponry cannot reach or cannot hit, but at the same time are targets that pose a great threat to our military, that have an important influence on the course of operations, or that play a supporting role to the war as a whole.<sup>9</sup>

Long-range strikes against some bases in Japan would seem to fit the conditions under which only missiles, at least initially, would come into play. Large bodies of water, such as the Yellow Sea, East China Sea, and the Sea of Japan, separate Chinese attackers from Japanese targets while some major

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<sup>7</sup> Liu Yonghui, *Foreign Aircraft Carrier Operational Command* (Beijing: Military Science Press, 2007), pp. 323–24.

<sup>8</sup> The term “powerful enemy” is usually code for the United States. Yu Jixun, ed., *The Science of Second Artillery Campaigns* (Beijing: Liberation Army Press, 2004), p. 401.

<sup>9</sup> Shou Xiaosong, ed., *The Science of Military Strategy* (Beijing: Military Science Press, 2013), p. 236.

bases, like Yokosuka naval base and Misawa airbase, are located on the Pacific-facing coast of the Japanese islands. Moreover, Japanese warships, submarines, and aircraft would mount stiff resistance along the approaches to the homeland while land-based missile and air defenses and fighters would defend the airspace over Japanese territory. The prospects of Chinese air and naval units fighting through such heavily-contested airspace and seas may be unacceptably risky or costly. Missiles would thus take the place of airframes and ships—as well as the personnel that man them—to fulfill such strike missions. Indeed, missiles may well be the weapons of first resort for the PLA to soften up enemy defenses, opening the way for follow-on operations by air and naval units.

### *China's Theater Strike Missiles*

The Second Artillery's growing missile prowess enables China to bypass fielded forces and directly attack bases in Japan. According to the Pentagon's latest annual report on the Chinese military, "The PLA is fielding conventional MRBMs [medium-range ballistic missiles] to increase the range at which it can conduct precision strikes against land targets and naval ships (including aircraft carriers) operating far from China's shores out to the first island chain."<sup>10</sup> The first island chain stretches from the Japanese main islands through the Ryukyus and Taiwan to the Philippines. Notably, the Pentagon reports for the first time in 2014 that "U.S. bases on Okinawa are in range of a growing number of Chinese MRBMs."<sup>11</sup> In its 2013 report, the National Air and Space Intelligence Center confirms that, "China is also acquiring new conventionally armed CSS-5 [DF-21] MRBMs to conduct precision strikes. These systems are likely intended to hold at-risk or strike logistics nodes, regional military bases including airfields and ports, and naval assets."<sup>12</sup>

The entire Japanese archipelago falls within range of Chinese conventional medium-range ballistic missiles and land-attack cruise missiles. Boasting a range of at least 1,750 kilometers, the DF-21C medium-range ballistic missile, if notionally deployed in central Jilin Province, can deliver its warhead to any target across Hokkaido, Honshu, Shikoku, and Kyushu.<sup>13</sup> Japan's four main islands are also within striking range of the ground-launched DH-10 land-attack cruise missile (LACM) with a reported range of at least 1,500 kilometers, if it is hypothetically launched from Jilin Province near the North Korean border.<sup>14</sup> In theory, the DF-21C and the DH-10 could land blows on such distant bases in eastern Japan as Yokosuka naval base and Misawa airbase. On paper, DH-10 cruise missiles fired from sites in central Jiangxi Province could reach Okinawa. The reported deployment of the DF-16 medium-range ballistic missile would add to the arsenal's threat to Japan.<sup>15</sup> With a possible range of up to 1,000 kilometers, the DF-16, if deployed to central Zhejiang Province, could easily attack Okinawa.

Since ballistic missiles and cruise missiles possess the ranges to strike the same set of targets across Japan, they can be used in combination. Several advantages accrue from using them together. First,

<sup>10</sup> Office of the Secretary of Defense, *Annual Report to Congress: Military and Security Developments Involving the People's Republic of China* (Arlington, VA: Department of Defense, 2014), p. 40.

<sup>11</sup> *Ibid.*, p. 31.

<sup>12</sup> National Air and Space Intelligence Center (NASIC), *Ballistic and Cruise Missile Threat* (Wright-Patterson Air Force Base, OH, July 2013), p. 14.

<sup>13</sup> Office of the Secretary of Defense, *Annual Report to Congress: Military and Security Developments Involving the People's Republic of China* (Arlington, VA: Department of Defense, 2011), p. 78 and NASIC, 2013, p. 17.

<sup>14</sup> Office of the Secretary of Defense, *Annual Report to Congress: Military and Security Developments Involving the People's Republic of China* (Arlington, VA: Department of Defense, 2012), p. 29.

<sup>15</sup> U.S. official classification of the DF-16 missile varies. In testimony to the U.S. Senate Armed Services Committee, the Director of the Defense Intelligence Agency, Lieutenant General Vincent Stewart, described the DF-16 as a medium-range ballistic missile. According to the Pentagon and NASIC, an MRBM's minimum range is 1,000 kilometers. NASIC, by contrast, classifies the DF-16 as a short-range ballistic missile with an estimated range of at least 800 kilometers. See Lieutenant General Vincent R. Stewart, Director, Defense Intelligence Agency, "Worldwide Threat Assessment," Statement before Senate Armed Services Committee, United States Senate, Washington, D.C., February 26, 2015, pp. 11-12 and NASIC, *Ballistic and Cruise Missile Threat*, 2013, pp. 10 and 14.

numbers matter. Mass furnishes more options: more targets can be struck, larger salvos can be launched, and the missile campaign can be sustained for longer periods. Second, the missiles can share the burden of attacking bases. Certain targets requiring greater accuracy could fall to cruise missiles. Cruise missiles can also conduct follow-on strikes after the first waves of ballistic missile raids. Third, the radically different fight profiles of ballistic and cruise missiles would further stress, if not overwhelm, the enemy's ability to defend against the incoming missiles. Cruise missiles can fly at low altitudes and can be programmed to approach a target from virtually any direction, further complicating the defender's task of detecting and intercepting them. In the future, air-, ship-, and submarine-launched cruise missiles, if they become more widely available and are deployed in larger numbers, would give the PLA even more ways to deliver precision firepower.<sup>16</sup>

The Academy of Military Science's course instruction on waging military campaigns specifically identifies ground-, air-, and sea-launched missiles as important components of a larger "campaign firepower engagement."<sup>17</sup> Ground-launched missiles can cover long distances, hit targets accurately, and penetrate enemy defenses. Bombers can conduct deep surgical strikes from standoff distances while submarines and surface combatants can deliver long-range, precise, and destructive missiles. Notably, the "suddenness" of a sub-launched missile attack is described as "irreplaceable." The combined use of these weapons, in "joint firepower strikes" would clearly furnish the PLA a wide array of options to attack enemy bases.

Range, accuracy, and operational flexibility are not the only measures of China's missiles threat to bases in Japan, however. The size of the missile force that the PLA could employ to inflict meaningful damage to those bases is another critical variable. While a detailed numerical analysis of China's theater strike capabilities will not be attempted here, it is worth noting that quantity matters. Large bases with many high-value facilities, such as those on the Japanese islands, would require more than a handful of missiles to destroy or degrade. Base functions that can be repaired and restored quickly, like runways, must be kept unusable with repeated attacks. Moreover, targets that survived previous raids must be struck again. In wartime, missiles could fall prey to malfunction, outright misses, interception by enemy ballistic missile defense systems, and other low-tech methods by defenders to defeat the incoming missiles. Possessing adequate inventory to account for attrition is thus particularly crucial for ballistic missiles that can only be used once.

Indeed, Chinese analysts are keenly aware that the PLA's long-range missile force—a scarce, expensive, and capital-intensive commodity—must be reserved for the most important targets. As the *Science of Military Strategy* observes:

Owing to the influence of such factors as the conventional missiles' destructive power, the quantitative scale of the missiles, and the costs of striking with conventional missiles, the types of targets suitable for conventional missile strikes are limited. The Second Artillery's conventional missile power is limited in its ability to strike the number of targets available while it is not economical to strike some targets using conventional missiles.<sup>18</sup>

The value of the targeted objects must correspond with the level of effort—measured in terms of the availability and the cost of the striking missile force—required to destroy those objects. In short, the Second Artillery must be good stewards of its precious resources.

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<sup>16</sup> For an analysis of how land-attack cruise missiles might be employed against Taiwan, see Dennis M. Gormley, Andrew S. Erickson, and Jongdong Yuan, *A Low-Visibility Force Multiplier: Assessing China's Cruise Missile Ambitions* (Washington, D.C.: NDU Press, April 2014), pp. 79-82.

<sup>17</sup> Qiao Jie, *The Science of Campaigns Course Material* (Beijing: Military Science Press, 2012), pp. 226-231.

<sup>18</sup> Shou Xiaosong, ed., *The Science of Military Strategy*, p. 236.

At present, the modest number of conventionally-armed DF-21Cs somewhat limits what the Second Artillery can do with this specific class of missiles.<sup>19</sup> Employing the MRBMs against all U.S. bases in Japan would spread the force too thin, diminishing its overall impact. For now, the PLA would probably have to direct its crosshairs on some priority bases—or a single base—that it considers critical to the U.S.-Japan alliance or sufficiently threatening to Chinese forces. For example, the PLA may choose to employ the DF-21C against one or a small number of bases on Honshu, including Iwakuni air station, Atsugi airbase, Yokota airbase, Yokosuka naval base, and Misawa airbase that are beyond the reach of the DF-16s and other short-range ballistic missiles. Or, it may strike a closer and very lucrative target like Kadena airbase. Even so, the DF-21Cs could potentially inflict severe damage. Against a select few, China may possess enough missiles to deliver several intense pulses of firepower before running out. The Second Artillery would likely employ the MRBMs in the initial waves of attacks to paralyze base operations, kicking the door down for follow-on cruise missile strikes. To maximize their effects, the missiles could be dedicated to targets that are particularly difficult to replace or repair quickly.

Open-source references do not provide sufficient data about the precise size of the DF-21C force or the growth trajectory of the arsenal. If the MRBM inventory remains relatively unchanged, then it can be inferred that the PLA intends to concentrate the missiles against a few bases at the outset of a campaign. If, however, the Second Artillery fields a sizable DF-21C missile force in the coming years, then the PLA may be preparing for a larger-scale undertaking involving more bases across Japan. Whether China will build substantially more MRBMs, which are not cheap, depends on calculations of cost, potential opportunity costs, and alternative strike options. Other methods for delivering precision firepower, including land-attack cruise missile raids launched from bombers, could become a more prominent component of China's missile strategy, one that would still pose a major threat to U.S. bases in Japan.

### *China's Missile Strategy*

The Second Artillery's family of theater strike systems is at the heart of Beijing's strategy to deter U.S. and allied intervention over such potential flashpoints as a cross-strait conflagration. For a high-intensity conventional military campaign to obtain its maximum effectiveness, the PLA would need to inflict substantial damage to Japanese and American airfields and naval facilities that are critical to allied air superiority and sea control, the operational prerequisites for thwarting Chinese war aims. As such, missile salvos designed to degrade or disable Kadena, Yokota, Misawa, Iwakuni, Yokosuka, and Sasebo naval base would aid substantially the PLA's opening moves.<sup>20</sup> The missiles would disrupt the use of bases by military units already deployed there while barring U.S. reinforcements from other locations to those bases. China would, in effect, erect a contested zone across large parts of maritime Asia, severely hampering allied freedom of movement.

These missiles could be employed against major air and naval bases across the Japanese archipelago. At airbases, missiles could attack runways, hangars, maintenance shops, ammunition storage sites, and command and control centers. Aircraft parked in the open would be exposed to destruction on the ground.<sup>21</sup> Chinese ballistic and cruise missiles could be launched against fuel storage tanks, ammunition depots, dry docks, machine shops, and pier-side facilities located at major naval bases. Warships and supply vessels fixed at their berths would be at risk while ships undergoing overhaul in dry docks would be easy targets. Civilian and military personnel, including shipyard workers and ground crews critical to

<sup>19</sup> For an open-source estimate of the number of DF-21Cs, see Jon Solomon, "The Chinese DF-21 Arsenal: An Open Source Assessment of What its Fielded Composition Says About its Likely Doctrinal Roles, Parts 1-4," *Information Dissemination*, November 10-13, 2014. Solomon calculates that the Second Artillery could possess a maximum of 40 DF-21C missiles.

<sup>20</sup> Toshi Yoshihara, "Japanese Bases and Chinese Missiles," in Carnes Lord and Andrew S. Erickson, eds., *Rebalancing U.S. Forces: Basing and Forward Presence in the Asia-Pacific* (Annapolis, MD: Naval Institute Press, 2014), pp. 37-65.

<sup>21</sup> In the context of attacks against airbases in Taiwan, see David A. Shlapak, et. al., *A Question of Balance: Political Context and Military Aspects of the China-Taiwan Dispute* (Santa Monica, CA: RAND, 2009), pp. 31-51.

the proper functioning of the bases, could suffer casualties in a missile raid. A concerted Chinese missile campaign could thus deliver a major blow to the logistical foundations of Japanese forces and of U.S. forward presence in Asia. By disrupting the supply system and degrading repair capabilities, Beijing aims to choke off the allied capacity to conduct combat operations.

While successful attacks on bases in Japan would by no means constitute a war winner for Beijing, they almost certainly would complicate U.S. war planning while magnifying the tyranny of distance inherent to air and fleet operations in the vast Pacific. At the very least, doing great harm to the region's basing infrastructure at the outset of conflict could help the PLA slow down or hold at bay U.S. and allied forces operating along the approaches to the Chinese mainland. An effective suppression campaign against naval and air bases could preclude a quick allied response to China's first military moves, degrade the capacity to contest Chinese use of the air and the sea, disrupt the flow of U.S. reinforcements into the combat theater, and drive up the cost of sustaining follow-on operations.

Conversely, this potential vulnerability underscores the centrality of Japanese bases to the U.S. strategy in Asia. Take Yokosuka, for example. It is the only facility west of Hawaii that possesses the wherewithal to handle major carrier repairs. This base is also an indispensable forward logistical hub without which U.S. naval units would be forced to rely on a far more time-consuming supply chain located in Guam, Hawaii, San Diego, and Singapore. Yokosuka's strategic location, physical infrastructure, world-class facilities, and highly-skilled local work force are virtually impossible to replicate anywhere else in Asia. Similarly, without Kadena and other forward air bases in Japan, U.S. aircraft would likely have to fall back to Andersen Air Force Base in Guam, almost 2,300 kilometers to the southeast of Okinawa. From such a distance, the U.S. Air Force would have to generate a potentially unsustainable number of sorties, including tankers to refuel inbound and outbound fighters, just to match the combat power that Kadena can bring to bear in theater.

But this is not just a problem for the United States. Chinese missiles could also threaten bases used exclusively by Japanese forces. Units from the Air and Maritime Self-Defense Forces (ASDF and MSDF respectively) use Naha International Airport in Okinawa, which is theoretically within range of China's DF-16 missile. The MSDF's P-3C aircraft and the ASDF's F-15 fighters operate from there. These aircraft, especially those parked in the open or in unhardened shelters, would be highly vulnerable to a PLA missile raid. Indeed, they could be destroyed on the ground before ever having the chance to launch their first sorties. Chinese missile barrages also could cut Naha's single runway, precluding aircraft from taking to the air, at least during the initial stages of a conflict. Bases in Kyushu, including the MSDF's Kanoya airbase and the ASDF's Nyutabaru airbase and Tsuiki airfield, would also be within range of Chinese medium-range ballistic missiles.

The MSDF's main naval bases are Ominato, Yokosuka, Kure, Sasebo, and Maizuru. Notably, Sasebo is notionally within striking distance of the DF-16, if reports of its 1,000-kilometer range are accurate. Meanwhile, China could target Japan's capital ships that are in port or underway. The MSDF has invested in ever-larger helicopter carriers, including the *Hyuga* and the *Izumo*, to boost its capacity to sustain rotary-wing anti-submarine warfare operations. Such high-value ships could be enticing to the PLA, and they would be easy targets if a Chinese missile raid catches them in port and at pier-side. In addition, China's anti-ship ballistic missiles (ASBM) could potentially target these higher-signature vessels.<sup>22</sup> As former fleet commander of the MSDF, Admiral Makoto Yamazaki, warned, "If the ASBMs are simply programmed to track large ships, then the large 22DDH [the *Hyuga* helicopter carrier] would be an attractive target second only to the U.S. aircraft carrier in the Japan-U.S. fleet conducting joint

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<sup>22</sup> For an excellent overview of ASBM development, see Andrew Erickson, *Chinese Anti-Ship Ballistic Missile (ASBM) Development: Drivers, Trajectories and Strategic Implications* (Washington, D.C.: Jamestown Foundation, 2013).

operations."<sup>23</sup> Another former fleet commander, Admiral Mutsuyoshi Gomi, expressed similar concerns.<sup>24</sup>

### *Implications for the U.S.-Japan Alliance*

To cope with China's missiles, the U.S.-Japan alliance should: 1) bolster the wherewithal to absorb punishment; 2) make the most of Japan's superb civilian infrastructure and unique maritime geography; 3) defend actively against ballistic and cruise missile threats; and 4) improve allied operations in peacetime. The operational goals are to impose more costs on China's offensive strategy, deny China's bid to seize the initiative with a rapid first move, increase the likelihood of stalemate, buy time for the United States to rush reinforcements to Japan, and improve the allied capacity to restore command of the Asian commons. Ultimately, the objective is to cast greater doubt on the efficacy of a Chinese missile campaign, thus disinclining China to act in the first place.

Resilience is central to allied strategy. Accordingly, Japan is turning to the mundane, but no less important, task of shoring up the basing infrastructure across the Japanese islands. For example, hardening important facilities and expanding underground storage sites would strengthen Japan's capacity to withstand Chinese missile strikes. The ability to repair infrastructure damage rapidly, such as cut runways, following missile attacks also would enable the U.S.-Japan alliance to recover from China's first blow and sustain subsequent military operations. Notably, the 2013 National Defense Program Guidelines direct the Self-Defense Force (SDF) to "improve survivability, including the recovery capabilities of military camps and bases."<sup>25</sup> The allied capacity to endure punishing bombardment would go far to deny Beijing the quick, decisive victory that it evidently believes is possible with an overwhelming missile strike.

Japan is also diversifying the risk to its bases. At present, the concentration of allied assets in a few locations substantially simplifies Chinese targeting. The PLA only needs to throw the weight of its missile barrages against a handful of large bases across Japan to achieve its anti-access aims. To balk China's strategy, alternate airfields and ports could be made available to U.S. and Japanese forces. The 2013 NDPG pledges to "undertake necessary deliberations concerning civilian airports and ports...in order to ensure that such facilities can be used as part of the operational infrastructure of the SDF."<sup>26</sup> This is a promising start.

Civilian airports, commercial shipyards, and piers across Japan could be conscripted for use in wartime. More than 100 airports of varying sizes are located across the Japanese islands. In addition to Kansai and Narita International Airports with 4,000-meter runways, more than a dozen international and regional airports have runways that are at least 3,000 meters long. The latter includes Fukuoka, Kagoshima, Kumamoto, and Nagasaki airports in Kyushu located near the East China Sea, a likely area of intense air and naval combat should a conflict break out with China. Many others spread across the archipelago have runway lengths between 2,000 to 2,500 meters. In Tokyo Bay alone, 31 civilian ports dot its 180-kilometer coastline, including such major ports as Tokyo, Chiba, Yokohama, Kawasaki, Yokohama, and Kisarazu.

With sufficient early warning, allied air units could disperse to these airfields while naval vessels could sortie out to sea, diluting China's confidence that it can disrupt enemy operations in a single blow against a few bases. If their home bases are disabled or temporarily unavailable in a conflict, U.S. and Japanese forces could fall back on these sites to refuel, rearm, undergo repairs, and permit crew rest. Flexible

<sup>23</sup> Makoto Yamazaki, "Thoughts about Eye-Catching 22DDH," *Ships of the World*, (September 2009), p. 105.

<sup>24</sup> Mutsuyoshi Gomi, "The Development of China's Naval Power," *Japan Military Review*, (May 2013), p. 164.

<sup>25</sup> Japan Ministry of Defense, National Defense Program Guidelines for FY 2014 and beyond, December 17, 2013, p. 24.

<sup>26</sup> *Ibid.*, p. 25.



access to a larger number of widely distributed airfields and ports across the Japanese islands would help allied forces survive, recover, and regroup after the first waves of Chinese attacks. The alliance would thus be in a much better position to wrest the initiative from China and retake command of the commons in subsequent phases of the war. Such a posture would also pose a serious challenge to the PLA. The potential costs of committing a finite number of missiles to a multiplying set of targets would likely be prohibitive. Moreover, the burden on China to keep track of enemy whereabouts would mount, thus stressing its intelligence, surveillance, and reconnaissance assets while adding to the fog of war. The more friction and uncertainty the alliance can impose on China, the better.

In addition to building resilience into the basing infrastructure, Japan could deploy counterforce weaponry on the Ryukyu Islands to impose additional costs on the PLA's missile force. In crisis or wartime, Tokyo could position truck-mounted anti-ship and anti-air missile units across the southern archipelago to erect a formidable barrier against China's air and naval forces. Able to "shoot and scoot," Japan's mobile platforms can disperse and move by night or under cover to escape Chinese counterstrikes. Tunnels, hardened shelters, disguised storage sites, and decoys on the Ryukyus would further undermine the PLA's capacity to identify, target, and destroy missile units.

If PLA commanders could be coaxed into nullifying these Japanese defenders, then the effects would be similar to those of the dispersal strategy described above. Any Chinese attempt to eliminate Japan's elusive missile batteries would require the PLA to open a geographic front about 1,000 kilometers wide. Moreover, a Chinese suppression campaign involving air power and ballistic- and cruise-missile strikes would accelerate the rate at which the PLA consumed finite stocks of munitions, airframes, and airmen. Such exertions, however, likely would prove disappointing, à la coalition forces' fruitless "SCUD hunt" during the first Gulf War while tying down portions of China's warfighting capacity. Conversely, Japan could absorb the losses of inexpensive missile-firing platforms. Such tactical costs would be especially worthwhile if, in the process of neutralizing Japanese defenders, China's military suffered its own attrition in ships sunk, aircraft downed, and missiles fired.

Active defenses to counter the missile threat, a centerpiece of U.S.-Japan technical cooperation, will remain relevant in this contest. Land- and sea-based ballistic missile defense systems, including American and Japanese *Aegis*-equipped destroyers and the Patriot Advanced Capability-3 (PAC-3) batteries deployed around key sites in Japan, are poised to track and intercept ballistic missiles. According to the latest Mid-Term Defense Program, Japan's maritime service will add two more to its fleet of four *Kongo*-class and two *Atago*-class destroyers while Patriot units will be upgraded with new interceptors to better defend against aircraft and cruise missiles.<sup>27</sup> While ballistic and cruise missile defenses would by no means immunize Japan from the voluminous firepower that the PLA is expected to unleash, a stout defensive effort would likely stiffen Japanese resolve to resist Chinese coercion. Ensuring that some proportion of China's missiles does not get through would further drive up the costs of an offensive strategy.

Finally, in peacetime, Japan and the United States must develop their capacity to survive, recover, and reengage enemy forces following a missile attack to shape China's risk-benefit calculus. Adequate investments in hardening existing facilities and in active defenses, including advanced air defense systems against cruise missiles and aircraft, would be an important first step. Periodically rotating forces through civilian airfields and ports would test the feasibility of dispersal. Japan could also dispatch missile-armed batteries to the Ryukyus on a regular basis or station a permanent, but limited, presence on the islands. Such visible rehearsals would sharpen tactical skills and strengthen allied coordination while demonstrating to Beijing the potential futility of an easy win and the likely risks of a protracted contest. Keeping China on notice would do much to shore up deterrence.

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<sup>27</sup> Japan Ministry of Defense, Mid-Term Defense Program, (FY2014-2018), December 17, 2013, pp. 11 and 33.

It is worth noting that these responses, individually or collectively, to China's missile threat do not constitute a silver bullet. At best, Tokyo forces a stalemate with Beijing by diminishing, to the extent possible, the effects of Chinese missile raids. Nevertheless, deadlock may buy enough time for the U.S.-Japan alliance to recover from the initial shock of battle and for American forces to rush reinforcements into the combat theater. Follow-on operations would be required for U.S. and Japanese forces to roll back any operational gains the PLA may have made in the initial phases of a conflict. Resilience is but the first step in an iterative and interactive contest.

**OPENING STATEMENT OF DENNIS GORMLEY  
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UNIVERSITY OF PITTSBURGH**

MR. GORMLEY: Thank you, Vice Chairman Shea and Commissioner Tobin, for inviting me to present today. It's a distinct honor.

My comments in large measure follow on to those just presented and reflect some suggestions I have for considering the broader implications of the developments we're here to discuss today.

This summer the Pentagon's Defense Science Board will hold yet another Summer Study addressing the question what have we overlooked due to our preoccupation with fighting two wars over the last 14 years? Among the key topics I'm told is what to do about the threat of land-attack cruise missiles, particularly in the area of defending against them?

Since the late 1980s, the Defense Science Board has conducted, by my count, around a dozen Summer Studies focused exclusively on hedging against the emergence of the land-attack cruise missile threat, which seemed to be taking a very slow pace in terms of countries acquiring them.

This all changed in the early 2000s, roughly 2003, 2004. I wrote a book about it called *Missile Contagion*, which documents the widespread proliferation of land-attack cruise missiles occurring after the period 2003, most notably in regard to China.

How do we move forward in addressing the most critical weaknesses in terms of defending against the Chinese missile threat, particularly in the stringent financial environment that the DoD faces? We already have guidance in that regard in the form of a December 2013 document called "Joint Integrated Air and Missile Defense Policy: Vision 2020," signed by the Chairman of the Joint Chiefs of Staff, General Martin Dempsey.

And let me quote briefly General Dempsey's remarks: "We must first find ways to avoid scenarios where adversaries launch large numbers of relatively cheap rockets, ballistic and cruise missiles, or unmanned air systems, and our only response option is to intercept them with highly complex and expensive weapons."

Well, we're talking here principally about the Chinese ballistic and cruise missile threat. According to General Dempsey, the solution must include, quote, "making interdependent joint and combined force employment the baseline"--end quote.

That translated means that the goal should be to fully merge the service programs--Army, Navy and Air Force--into an integrated whole to deal with this complex threat. This has happened, importantly, in the ballistic missile area but not with respect to land-attack cruise missiles. We have modest defenses with respect to ballistic missiles, in my view, and virtually none with respect to land-attack cruise missiles.

We need to focus on modest approaches to cruise missile defense for reasons that General Dempsey pointed out--the financial constraints we face. And they must focus on avoiding enhancing China's predilection toward preemptive action in deep crises. Modest cruise missile defense efforts might be wisely complemented by some combination of hardening airfields, C4I facilities in the Asia-Pacific region, and diversifying the placement of our extensive aircraft based more so on survivability than efficiency, in order to complicate adversary planning.

These kinds of measures would allow us to better able to be prepared to cope with the tension between military response and provocation by stabilizing explosive crisis circumstances rather than fostering the incentive to preempt on China's part. So the focus ought to be complicating their planning for that initial preemptive strike.

What might modest cruise missile defense deployments accomplish, particularly when accompanied by base hardening and diversification? It would deny the PLA a "free-ride" for the most precise means of delivery, land-attack cruise missiles. They would complicate the delicate timing involved in Chinese coordination of first- wave ballistic and cruise missile strikes and the subsequent timing of follow-up air operations, which is a complex endeavor indeed.

In short, China would face uncertainty in dealing with both ballistic and cruise missile strikes

with some modest investment in cruise missile defenses.

These complications must be viewed in the context of China's long-term quest to become truly proficient through acquiring the necessary enabling technologies and systems to optimize missile performance.

Shortcomings exist in intelligence support, command and control, platform stealth and survivability, and post-attack bomb damage assessment, all of which are crucial for the PLA to achieve missile success.

Let me touch on just two more key shortcomings. A key question is whether China possesses the necessary command and control infrastructure, or C4ISR. The challenge of carefully orchestrating a complex, multifaceted air and missile campaign over many days depends on both human and technical factors, extremely well-trained military personnel who have practiced these routines in diverse ways over many years, and the command and control architecture needed to deal with complex combined-arms operations involving multiple service organizations.

Absolutely critical to achieving the delicate timing between waves of missile strikes designed to leverage the effectiveness of subsequent aircraft strikes is developing the skill to coordinate and deconflict large salvos of missiles and waves of aircraft operating in multiple sectors. It is doubtful that China could execute such a complex joint campaign with any degree of confidence, notwithstanding the creation of a fire support or a Firepower Coordination Center recently within their joint theater command.

It is commonplace to underestimate command and control, which the Chinese have only recently begun to take seriously from a joint force standpoint. Retired U.S. Navy Captain Wayne P. Hughes offers a useful reminder about command and control in his classic book, *Fleet Tactics: Theory and Practice*, and I quote:

"The art of concentrating offensive and defensive power being complicated, it is easy to exaggerate the potential of the enemy to master it."

China's achievement of proficiency, even with the use of one weapon, no less fully integrated proficiency in combined-arms warfare, will require lengthy periods of mastery. Take, for example, the U.S. Navy's successful use of Tomahawk land-attack cruise missiles. What is unique about today's Tomahawk land-attack cruise missiles, even the latest Block IV version, is the extent to which its performance has benefited from years of feedback from system diagnostics collected since the 1970s.

Armed with such important knowledge about Tomahawk performance--I call it forensic engineering--it is no surprise that the current versions of the missile greatly exceed the performance of Tomahawk's progenitors.

While China will probably not require decades to develop high confidence in land-attack cruise missile performance, it will require time and dedicated effort before it can expect that its missile force will perform as desired, particularly in combined-arms campaigns and especially in the absence of real war experience.

That's the good news. The bad news is that China seems more inclined to couple their large inventory of missiles to a truly offensive war strategy. This suggests that while the threshold between conventional and nuclear war may seem like it's being raised, the vital threshold between peace and war may correspondingly be lowered. We can ill afford to ignore such a development.

Thank you.

**PREPARED STATEMENT OF DENNIS GORMLEY  
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**Testimony before the U.S.-China Economic and Security Review Commission  
Hearing on China's Offensive Missile Forces  
April 1, 2015**

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**1. Drivers of China's Conventional Missile Forces**

A combination of political, economic, and security factors has driven China's ambitious program of acquiring offensive missiles. Beijing's political leadership surely absorbed important lessons from the Taiwan Straits crisis of 1995-96, when China, in response to Taiwan's independence predilections, launched a highly orchestrated series of missile tests off the coast of Taiwan. While the Clinton administration responded by deploying with two aircraft carrier battle groups, China arguably succeeded in coercing Taiwan to tone down its rhetoric in regard to its wish to achieve independence from China.<sup>29</sup> If nothing else, the 1995-96 crisis managed to convince both Beijing and Washington that a war over Taiwan was by no means far-fetched. And in the aftermath of the U.S.-China confrontation over Taiwan, Beijing's political leadership saw fit to support the huge growth in the People's Liberation Army's arsenal of ballistic missiles facing Taiwan over the next decade. In short-range ballistic missiles (SRBMs) alone, China's Second Artillery's holdings grew from roughly 350 in 2003 to 1,100 today.

Clearly, China's conventional missile buildup has benefited from nearly double-digit annual increases in the defense budget over the last two decades. This comes as defense spending in the United States inevitably declines in the aftermath of fighting two wars in Iraq and Afghanistan since 2001. Yet, China faces a number of economic uncertainties that could adversely affect the level of support for defense spending. As China specialist Andrew Erickson argued before this body in January 2014, "The economic model that propelled China through three decades of meteoric growth appears unsustainable."<sup>30</sup>

Large structural factors lie at the heart of China's economic challenges, including dealing with access to clean water, remuneration costs related to environmental degradation, rampant corruption, potential divisiveness between urban and rural populations, and ethnic and religious unrest. Making matters worse are continued growth in chronic diseases coupled with the inevitable demographic changes China faces stemming from its one-child policy. Combined, these latter two developments will place stiff demands on China to cope with an aging population and a substantially diminished younger age cohort. In the end, how China addresses slower growth, rising financial demands, and internal security challenges, which have already elevated the cost of internal security to exceed that of defense spending, will ultimately

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<sup>28</sup> My testimony draws in part on Dennis M. Gormley, Andrew S. Erickson, and Jingdong Yuan, *A Low Visibility Force Multiplier: Assessing China's Cruise Missile Ambitions* (Washington, DC: NDU Press, 2014), <http://ndupress.ndu.edu/Portals/68/Documents/Books/force-multiplier.pdf> and Dennis M. Gormley, *Missile Contagion: Cruise Missile Proliferation and the Threat to International Security* (Annapolis: Naval Institute Press, 2010).

<sup>29</sup> For an analysis of the Taiwan Strait crisis as a case of coercive diplomacy, see Andrew Scobell, "Show of Force: The PLA and the 1995-1996 Taiwan Strait Crisis," Working Paper, Shorenstein APARC, January 1999.

<sup>30</sup> Andrew S. Erickson, "Testimony Before the U.S.-China Economic and Security Review Commission, Hearing on China's Military Modernization and its Implications for the United States," January 30, 2014.

shape Beijing's success in achieving military modernization on a par with the threats China faces.<sup>31</sup>

A third and potent factor driving China's rapid development of its conventional missile capabilities and forces bears on the PLA's security perceptions. Not having experienced a war since its brief military engagement with Vietnam in 1979, China has studied closely and extracted key lessons from America's success in the First Gulf War against Iraq, NATO's 1999 war with Serbia over Kosovo, and the PLA's presumed appreciation of the role missiles played in the Soviet-era air operation.

The First Gulf War of 1991 demonstrated the extent to which the U.S. military not only greatly exceeded the military capacity of Iraq but also of any other conceivable adversary it was likely to face. And such military capabilities, left unchecked, were destined to only grow if the U.S. military remained on course to pursue the essential elements of a true "Revolution in Military Affairs." The truth is that the 1991 Gulf War only dimly reflected signs of revolutionary changes in warfare. Virtually all the weapons used, however effective, were decades old. Nor were there any dramatic doctrinal, operational, or organizational innovations demonstrated. Nevertheless, what China surely took note of was evidence of revolutionary increases in effectiveness in the area of long-range precision strikes. Post-war analyses demonstrated that although comparatively few—on the order of 10 percent—precision-guided munitions (PGMs) were used, compared to "dumb" (meaning unguided) bombs, according to the post-war Air Power Survey, the target/sortie ratio in representative sorties for both PGMs and unguided bombs showed a 13:1 advantage for the precision case versus the non-precision one.<sup>32</sup> As a result, during the bombing of Yugoslavia in 1999, 30 percent of the bombs used were PGMs, while that figure grew to nearly 70 percent during the Afghan air campaign in 2001 according to press reporting.<sup>33</sup>

Despite the modest evidence of truly revolutionary advances by the U.S. military, the PLA's reading of events in the First Gulf War implied a huge gap between China's military capabilities and U.S. military advances evidenced in the swift defeat of Saddam Hussein's army. As Aaron Friedberg reports, "China now needed to prepare not only for 'limited, local wars,' but also for 'local wars under high-technology conditions.'" The clear message that China took away from the First Gulf War was the necessity to find ways for the "weak to defeat the strong."<sup>34</sup>

Supported by the achievement of information dominance, and by taking full advantage of its ability to dominate the reconnaissance battle at the outset of any war along its own periphery, Chinese planners recognized the critically important role ballistic and cruise missiles could play, particularly when they are employed preemptively.<sup>35</sup>

During the mid- to late 1970s, as China was just beginning to extract itself from the devastation of Mao's decade-long Cultural Revolution, the Soviet Union's military planners were reorganizing their air and air defense forces to provide greater flexibility in employing long-range strike aircraft, close-air support, and air defense of the ground forces. The goal was to refine the air operation so as it could become a substitute for the initial mass nuclear strike that was then the dominant Soviet way to begin a war with

<sup>31</sup> "China's Spending on Internal Policing Outstrips Defense Budget," *Bloomberg Business*, March 6, 2011, <http://www.bloomberg.com/news/articles/2011-03-06/china-s-spending-on-internal-police-force-in-2010-outstrips-defense-budget>.

<sup>32</sup> Thomas A. Keaney and Eliot A. Cohen, *Gulf War Air Power Survey, Summary Report* (Washington, DC: US Government Printing Office, 1993), pp. 242-244.

<sup>33</sup> Scott Peterson, "'Smarter' bombs still hit civilians," *Christian Science Monitor*, October 22, 2002, <http://www.csmonitor.com/2002/1022/p01s01-wosc.html>.

<sup>34</sup> Aaron L. Friedberg, *Beyond Air-Sea Battle: The Debate Over US Military Strategy in Asia* (Abingdon, Oxon: Routledge for IISS, 2014), p. 17.

<sup>35</sup> On the critical role that information dominance plays in Chinese doctrinal deliberations, see Mark A. Stokes, *China's Strategic Modernization: Implications for the United States* (Carlisle, PA: Strategic Studies Institute, 1999), chapter 3, <http://fas.org/nuke/guide/china/doctrine/chinamod.pdf>.

NATO. They also began improvements in ground force operations, logistics, command and control, mobility, and firepower. The focus of attention was on what they believed were the new conditions of warfare, principally including surprise and preemptive conventional operations. While the operational objectives and component parts of such preemptive operations were simple to conceive, they were complex to execute, especially compared with nuclear operations. And warfare being a two-sided phenomenon, any new emphasis on achieving conventional success would always be subject to the risk of nuclear escalation. Yet, such an ambitious objective would require a new conventional role for missile delivery systems, which had previously been largely a means of nuclear delivery.<sup>36</sup>

Key elements of the Soviet air operation can be seen in the synergy on display in the way China's dependence on missiles interacts with air operations.<sup>37</sup> In effect, missiles leverage the effectiveness of air power. Before missiles were sufficiently accurate to achieve success conventionally, the bulk of any preemptive first strike would have to be achieved using aircraft, which risked the loss of tactical surprise that much faster ballistic missiles would achieve. Aircraft would have to fly low-altitude missions to destroy enemy air defenses and thus become more vulnerable to enemy anti-aircraft missiles and guns. Most important, the desired shock and paralytic effect from aircraft alone would be greatly diminished by the demands of first taking out enemy air defenses.

Thus, the role of precursor ballistic and cruise missiles became the achievement of tactical surprise by catching most enemy aircraft on the ground. Aircraft released from having to achieve this paralytic blow could then fly higher altitude missions secure in the knowledge that fewer enemy air defense interceptors would meet them along the way to their targets. Before ballistic and cruise missiles were accurate enough to carry out this leveraging effect, they were seen as disadvantaged compared to aircraft, which on average can carry seven times the payload of a missile. Yet, the role that accurate missiles began to play due to their speed and probability of achieving paralytic effects enables previously more vulnerable aircraft to fully exploit their capacity on average to deliver seven times the payload of missiles.

## 2. The Intended Roles of China's Missiles in Conflict Scenarios

The primary mission that Chinese planners foresee for ballistic and cruise missile to execute is in support of a Taiwan scenario. They anticipate that such missile attacks would achieve the rapid if only perhaps temporary but critically important closure of Taiwan's airfields. Missile strikes against enemy airfield runways (primarily ballistic missiles), airbase command and control, early warning radar facilities, and ground-based air and missile defenses are valuable in order to enhance Chinese aircraft effectiveness. With Taiwan's air force largely prevented from—however temporarily—taking to the skies, Chinese aircraft could be released from air defense suppression responsibilities, allowing them to fly higher and deeper routes with heavier payloads and concentrate on reducing Taiwan's air sorties to a minimum. Chinese strategists see missile strikes against airbase runways and taxiways as designed, as Mark Stokes reports, to “shock and paralyze air defense systems to allow a window of opportunity for follow-on [Chinese air force] strikes and rapid achievement of air superiority.”<sup>38</sup>

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<sup>36</sup> When Mark Stokes reports about Chinese planners focusing on missile strikes to achieve “shock and paralysis,” it sounds very similar to what students were taught at the Soviet-era Voroshilov General Staff Academy. There students were taught “success in air operations is ensured by delivering surprise mass initial strikes on enemy airfields.” See Gormley, et. al., *A Low Visibility Force Multiplier*, endnote 6, p. 154. The Voroshilov General Staff Academy lectures acquired by the U.S. intelligence community in the 1980s and subsequently declassified and released. They are available through the Defense Technical Information Center. On what the Chinese might have learned from their Soviet brethren, see Xiaobing Li, *A History of the Modern Chinese Army* (Lexington: University of Kentucky Press, 2009).

<sup>37</sup> On the leveraging effects of missiles in support of an air operation, see Dennis M. Gormley, *Double Zero and Soviet Military Strategy: Implications for Western Security* (London: Jane's Publishing Co., 1988).

<sup>38</sup> Mark A. Stokes, “The Chinese Joint Aerospace Campaign Strategy, Doctrine, and Force Modernization,” in *China's Revolution in Doctrinal Affairs*, ed. James Mulvenon and Daniel Finkelstein (Alexandria, VA: CNAC Corporation, 2005).

Shock and paralysis come from a high volume of accurate fire occurring in a brief timeframe. This concept explains the rapid growth of the PLA Second Artillery as well as qualitative improvements in the People's Liberation Army Air Force (PLAAF) attack capabilities. China's short-range ballistic missile (SRBM) force grew from a single regimental-size unit to seven brigades by 2008, including five controlled by the Second Artillery and two directly subordinate to PLA ground forces, one in the Nanjing Military Region (MR), and another in the Guangzhou MR. This configuration may have changed more recently, according to Mark Stokes. In his April 2011 assessment he reports, "There are indications that two tactical missile brigades under the PLA Army have transferred to the Second Artillery."<sup>39</sup> By December 2010, China's arsenal consisted of 1,000 to 1,200 solid propellant, road-mobile SRBMs, all deployed opposite Taiwan. According to the Department of Defense's China Military Report for 2010, this includes 350-400 CSS-6 SRBMs (with 90-110 launchers) and 700-750 CSS-7 SRBMs (with 120-140 launchers). More recently, a Taiwanese media report cites the Taiwan Ministry of National Defense "China Military Power Report 2012" as claiming that the number of Second Artillery ballistic and land-attack cruise missiles (LACMs) aimed at Taiwan has increased from 1,400 in 2011 to 1,600 in 2012. And an increasing number of these missiles are outfitted with GPS to achieve precision effects. DF-16 medium-range ballistic missiles (MRBMs) have also been deployed in small numbers.<sup>40</sup>

As for LACMs, the 2009 DOD China Military Report estimates that by December 2009 China had deployed 200-500 DH-10 LACMs and 45-55 launchers.<sup>41</sup> In addition, an uncertain number of YJ-63 LACMs (two per H-6H medium-range bomber and possible some 3M-14E submarine-launched LACMs on kilo-class submarines) could figure into a campaign. The DH-10 is reported to be highly accurate; Jane's reports that it has a 10m circular error probable (CEP) accuracy.<sup>42</sup>

Missile launchers are included as a critical variable of effectiveness because they, not just the total number of missiles, define the intensity of fire within a particular unit of time during a campaign. This would be the case if missiles were employed to pin down Taiwan aircraft on their airfields, thereby preventing them from taking off to meet Chinese aircraft in air battles. These numbers interact sharply with the way in which Taiwan concentrates its primary aircraft at three of eight major airbases.<sup>43</sup> Taiwan does park some of its aircraft in hardened shelters, and a small strategic reserve of aircraft is hidden in hardened mountain bunkers. The number of China's short-range ballistic missile launchers (200-250), complemented by DH-10 LACM launchers (40-55 and presumably growing), permits intense pulses of conventional firepower against not only airfields but also other critical target sets, such as air and missile defense sites, early warning radars, command and control facilities, and logistical storage sites. LACMs, because they are more accurate than ballistic missiles, would likely be earmarked to take out point targets such as airfield hangers, command and control facilities, and logistic facilities, while ballistic missiles would likely deal with area targets, including airfield runways and taxiways. In addition to their precision quality, the virtue of LACMs is also reflected in their capacity to approach the targets from 360-degree angles of attack flying at low altitudes toward the target—an operational advantage that Taiwan's

<sup>39</sup> Mark A. Stokes, "Expansion of China's Ballistic Missile Infrastructure Opposite Taiwan," *AsiaEye*, April 18, 2011, <http://blog.project2049.net/2011/04/expansion-of-chinas-ballistic-missile.html>.

<sup>40</sup> Rich Chang and J. Michael Cole, "China aiming 200 more missile at Taiwan: MND," *Taipei Times*, September 4, 2012, [www.taipetimes.com/News/front/archives/2012/09/04/2003541913](http://www.taipetimes.com/News/front/archives/2012/09/04/2003541913).

<sup>41</sup> Detecting ballistic missiles is more likely to be the case than for LACMs, which are easier to hide and unlike for ballistic missiles during their development, LACMs do not involve the testing of large rocket motors that are more readily detectable by U.S. technical collection means.

<sup>42</sup> CEP is a measure of a missile's accuracy in which the radius within which 50% of the missiles land.

<sup>43</sup> According to "Taiwan—Air Force," *Jane's World Air Forces*, March 1, 2013, all Taiwan's Mirage 2000 air-defense aircraft (roughly 60) are housed at Hsinchu Air Base, while two other bases (Chiayi and Hualien) support around 120 F-16 air-defense/attack aircraft.



strategists both understand and fear.<sup>44</sup>

This section has concentrated on China's newfound interest in and deployment of LACMs, which, as argued here, play a critically important role in attack scenarios against Taiwan's airbases and other critical military facilities. Over a much longer period of time, China has also substantially increased its holdings of anti-ship cruise missiles (ASCMs) for attacks primarily against enemy ships at sea. For example, rather than depending largely on foreign suppliers, China has developed its own highly capable ASCMs (the YJ series). Yet, the most worrisome ASCM acquisition is Russia's Sunburn and Moskit supersonic ASCMs with ranges of 120 and 240 km, respectively. Virtually every new surface ship and conventionally powered submarine in the PLA Navy (PLAN) can launch ASCMs, allowing these platforms to serve as "aquatic TELs" (Transporter-Erecter-Launchers).<sup>45</sup> Still, even though training has improved in recent years and improved guidance systems have become available to the PLAN's ASCMs, over-the-horizon targeting remains a challenge.

China possesses far more ASCMs than the U.S. Pacific Fleet would employ. Hypothetically speaking, for a Taiwan scenario, a typical U.S. Carrier Strike Group (CSG) might sail with three or four ASCM-capable combatants. Assuming that only a third of the PLAN surface combatant fleet would be operating in support of such a scenario against one U.S. CSG, the ratio of ASCMs on the battlefield would be at least 7:1 in favor of the PLAN. This ratio does not include the number of air and (in China's case) submarine-launched ASCMs that might be massed during such an engagement. Factors such as weapon system readiness, reliability, load-out, firing policy, and ASCM effectiveness during saturation attacks are also not considered here. This is not to say that these factors would not influence the outcome of the ASCM battle, of course. In any event, assuming that both PLAN and U.S. forces would apply maximum available combat power, it is difficult to imagine a situation in which a lone U.S. CSG could flip the ASCM ratio in its favor.

To be sure, this is not the only relevant metric or comparison. It is not just a question of the ASCM ratios but also of the ability to move platforms that shoot ASCMs into range of their targets. It is not so much who has more ASCMs as who can fire them at the other side first. If one side has so many they literally do not need to target, then having more than the other is helpful. If not, then it may be irrelevant. If there are significant terminal defenses, that also might make overall inventories important, although it would be a case of one's side inventory versus the other side's defense, not a straight-on ratio of inventories.

It is important to keep in mind that the United States could use air and undersea platforms to target PLAN ships that get too far out from their air defense cover. Still, China's increasing ability to concentrate ASCM fires will have important implications for where the United States can and should employ CSGs. This may explain the U.S. Navy's apparent interest in electromagnetic rail guns.<sup>46</sup>

### 3. Assessment of China's Current Missile Capabilities

China has invested considerable resources both in acquiring foreign missiles and technology and in developing its own missile capabilities. These efforts are bearing fruit in the form of relatively advanced

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<sup>44</sup> Interview with a senior Taiwan official, April 2008, Monterey, CA. Targets vulnerable to LACMs but not SRBMs include aircraft housed in mountain revetments with doors at the base of the mountain. The most vulnerable aim point for a hardened shelter is the shelter door. Low-flying LACMs are worrisome because of their angle of attack and accuracy; even if they fail to penetrate the door, striking it would probably collapse it sufficiently to delay departure of aircraft, leading to a temporary functional kill.

<sup>45</sup> William Murray, *China's Undersea Warfare: A USN Perspective* (Newport, RI: China Maritime Studies Institute, Naval War College, May 11, 2011).

<sup>46</sup> "Navy Wants Rail Guns to Fight Ballistic and Supersonic Missiles Says RFI," USNI News, <http://news.usni.org/2015/01/05/navy-wants-rail-guns-fight-ballistic-supersonic-missiles-says-rfi>.

ballistic missiles and ASCMs and LACMs deployed on a wide range of platforms. To realize the full benefits, China will require additional investments in all the relevant enabling technologies and systems to optimize missile performance. Shortcomings remain in intelligence support, command and control, platform stealth and survivability, and post-attack damage assessment, all of which are crucial to missile success.

ASCMs and LACMs have significantly improved PLA combat capabilities and are key components in China's efforts to develop Antiaccess/area denial (A2/AD) capabilities that could increase the costs and risks for U.S. forces to operate near China, including in a Taiwan contingency. China plans to employ cruise missiles—especially LACMs—in ways that exploit synergies with other strike systems, including using LACMs to degrade air defense and command and control facilities to enable follow-on air strikes. Defenses and other responses to China's LACMs are minimal at best and a more focused effort is needed to develop technical countermeasures and effective operational responses.

The addition of both LACMs and growing number of ASCMs on multiple platforms begs the question of China's true ability to employ these weapons to maximum advantage. This depends on a multitude of factors, three of which bear mentioning.

A key question is whether China possesses the C4ISR (command, control, communications, computers, intelligence, surveillance, and reconnaissance) capabilities to fully exploit these growing missile capabilities. The challenge of carefully orchestrating a complex, multifaceted air and missile campaign over many days depends on both human and technical factors—extremely well-trained military personnel who have practiced these routines in diverse ways over many years and the command and control architecture needed to deal with complex combined-arms operations involving multiple service organizations. Chinese planners envision establishing a Firepower Coordination Center (FCC) within the Joint Theater Command, which would manage the application of air and missile firepower. Separate coordination cells would be created to deal with missile strikes, air strikes, special operations, and ground and naval forces. Absolutely critical to achieving the delicate timing between waves of missile strikes designed to leverage the effectiveness of subsequent aircraft attacks is developing the skill to coordinate and de-conflict large salvos of missiles and waves of aircraft operating in multiple sectors. It is doubtful that China could execute such a complex joint campaign with any degree of confidence.

In principle, the first wave of any air operation should be the easiest to execute, particularly if China manages to strike first, before critical targets such as aircraft have departed their airbases. But it is still a daunting execution task. Once the war begins chaos and complexity commence. It is commonplace to underestimate C4ISR, which the Chinese have only recently begun to take seriously from a joint-force standpoint. As retired U.S. Navy Captain Wayne P. Hughes argues in his classic book *Fleet Tactics: Theory and Practice*, “The art of concentrating offensive and defensive power being complicated, it is easy to exaggerate the potential of the enemy to master it.”<sup>47</sup> Consider the added complexity of achieving mastery of C4ISR in the multi-service context of joint, not just naval operations.

Since the late 1990s, the PLA has undertaken large-scale exercises and more recently begun to work on joint operations. Still, John Lewis and Xue Litai quote a PLA officer speaking candidly about such large-scale Chinese exercises: “The exercise is part of the PLA's annual training, but its political significance is greater than its military significance.”<sup>48</sup>

Proficiency with even the use of one particular weapon system is not achieved without lengthy mastery,

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<sup>47</sup> Wayne P. Hughes, *Fleet Tactics: Theory and Practice* (Suitland, MD: Naval Institute Press, 1986), p. 219.

<sup>48</sup> John Lewis and Xue Litai, *Imagined Enemies: China Prepares for Uncertain War* (Stanford: Stanford University Press, 2006), p. 261.

and not just in peacetime exercises or under peacetime test conditions but during actual combat operations—something China hasn't faced since 1979. Take, for example, the U.S. Navy's successful use of Tomahawk LACMs. Conventional wisdom has it that the revolution in information technology easily enables the precision delivery of conventional payloads over great distances in the form of LACMs aided by advances in global positioning system (GPS) technology. To be sure, the advent of GPS has contributed to the proliferation of LACMs over the last decade. Yet, the process of becoming truly proficient requires more than access to technology. What is unique about today's Tomahawk LACM, even the latest Block IV version, is the extent to which its performance has benefited from years of feedback from system diagnostics collected ever since the Tomahawk was first tested and later deployed in the 1970s. Most Tomahawks, in peace and war, have been analyzed to determine as precisely as possible what accounted for the missile's performance, good or bad. To learn from such successes and errors requires that missile specialists have the kind of sophisticated diagnostic equipment and system engineering skills that provide hints about system performance. Armed with such important knowledge about Tomahawk performance, it is no surprise that current versions of the missile greatly exceed the Tomahawk's progenitor.<sup>49</sup>

While China will probably not require decades to develop high confidence in LACM performance, it will require time and dedicated effort before it can expect that its LACMs will perform as desired, particularly in combined arms campaigns and especially in the absence of real-war experience.

Quantitative and qualitative capabilities of China's current missile programs will naturally adjust in accord with threat perceptions. Given their precision accuracy and important role in targeting critical target sets, one would expect growth in LACM holdings to continue in the near term and expand over the longer term to include China's own development of supersonic ASCMs and LACMs. Indications exist that an antiship variant of the DH-10 LACM with a range of 3,000km could be in the early phase of an R&D program, however much the targeting demands present stiff technological challenges. The success of all of these developments hinges on not only achieving technological breakthroughs but also China's success in coping with the stiff political, societal, and environmental demands briefly outlined in section 1 of my testimony.

#### **4. Prospects for the Dongfeng-21D Carrier Killer**

China faces stiff challenges in several needed components of its Dongfeng-21D carrier killer to transform it into a potent weapon system. Obviously, peacetime tests against land targets do not equate to finding the target carrier in the open ocean, maintaining continuous target tracking from a survivable target tracking system, reaching the intended carrier having penetrated the U.S. Navy's defensive means, and finally achieving disabling damage to the carrier.

Thus far, China seems to have placed most emphasis on improving its over-the-horizon radars. If they have found a solution to improving the resolution of such a system that it might differentiate a carrier from other large seaborne objects, that would be an important achievement. Nevertheless, the fact that OTH radars are fixed systems makes them immensely vulnerable in wartime. A less vulnerable option would be airborne or space-based radars; the U.S. Joint Stars or Global Hawk radar systems furnish an

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<sup>49</sup> Although data is sparse about Tomahawk's actual performance historically, Operation Desert Storm in 1991 saw Tomahawk's first used in combat, in which 317 missiles were employed. Tomahawk's performance in 1991 surely must have benefited from the fact that the system was tested repeatedly in peacetime for several years. Still, however much Tomahawk was tested and then used in 1991, there was still room for significant improvement, and that appears to have been the case in subsequent uses in actual combat operations. From the modest number (317 over three weeks of combat) employed in 1991, 420 Tomahawks were used in Operation Desert Fox (1998) in 4 days. In Operation Iraqi Freedom, that number jumped to 1,375 cruise missiles employed. There is public data for the U.S. Harpoon ASCM, which reportedly achieved a 50 percent reliability rate after 50 tests. See Gormley, *Missile Contagion*, chapter 6.

example of the former. But even these systems possess only a limited viewing field at the altitude they achieve. In principal, a more ideal altitude is to operate a large airship at near-space, between 65,000 and 328,000 feet altitude, something the Chinese appear to be investigating, as have other countries, including the United States. The most important weaknesses of near-space platforms (usually large helium-filled balloons) are that they provide large cross sections that can be affected by winds and turbulence during inflation, and particularly when they are launched and ascend into place in near space. The U.S. Army JLENS aerostat has experienced launch problems from high winds even at very low altitudes. Large constellations of electro-optical or radar sensors operating in low-earth orbits would in principle represent the best solution. In the late 1990s, the Pentagon's Defense Research Projects Agency proposed building a 24-48 constellation of radar satellites that could have, in principle (it was not funded), furnished near continuous coverage from a low-earth orbit, and conceivably could have evolved into a tracking system. Yet, the expense of such a large constellation, particularly one the size of which would furnish truly continuous coverage with high accuracy from low-earth orbit, would be exceptionally costly and technologically demanding. And assuming such a system were possible, its downlinks and component spacecraft could be subject to attack.

Another uncertainty is whether or not China has truly mastered the terminal guidance and maneuvering capability needed to successfully attack a moving aircraft carrier. Particularly demanding are the development of sensors and warheads that can survive the rigors of atmospheric reentry, including high speeds and temperatures—without adversely affecting required seeker and warhead performance. This endgame phase must also consider the defenses that China will face in attacking such a high priority target. To be sure, if the DF-21D approaches its target from a depressed trajectory and undergoes maneuvering before attacking, it will stress navy defensive systems. Still, the U.S. Navy has invested heavily in two transformative programs that have greatly improved defense of carriers. They include the E2-D's new AESA radar and an entirely new avionics system, and the introduction of a cooperative engagement capability, which effectively creates a single integrated operational picture by virtue of melding together all navy air defense sensors into a common picture. Thus, every shooter sees the same picture as all others, thus optimizing prospects for the highest probability interception.

Finally, it is also important to keep in mind just how robust navy carriers are. The USS Enterprise suffered a catastrophic accident at sea in 1969, in which nine 500-pound bombs exploded killing 27 sailors and injuring 300 others. Were it wartime, the carrier could have resumed operations within hours. Every new carrier entering the fleet undergoes new safety and damage control improvements.<sup>50</sup> To be sure, a successful DF-21D strike in the right place on a carrier could produce devastating results, but such resilience should be kept in mind.

## **5. China's Hypersonic Glide Vehicles**

China's interest in hypersonic glide vehicles is probably driven by a desire to keep pace with U.S. interest in the technology as well as the potential role these systems could play in warfare if they were successfully developed. In the latter regard, Chinese planners undoubtedly see great virtue to difficulties that hypersonic glide vehicles would create for existing U.S. missile defense systems. Difficulties would emerge because of the nature of boost-glide vehicles compared with ballistic missiles for missile defense detection and subsequent intercept. Ballistic missiles, as the name implies, fly on a ballistic or high arcing trajectory before returning to the target. They are therefore in principle comparatively easier to detect in mid-course than hypersonic glide vehicles, which are boosted into space but then travel on a generally flat trajectory in the stratosphere to their intended targets. This makes them more difficult targets to track, at least with today's missile defense systems.

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<sup>50</sup> Loren Thompson, "Aircraft Carrier (In)vulnerability," Naval Strike Forum, Lexington Institute, 2001.

The United States appears ahead of China in developing both hypersonic glide vehicles and scramjet-enabled hypersonic cruise missiles. The Boeing X-51 WaveRider hypersonic cruise vehicle failed its first two tests and then achieved a flight of over 6 minutes with a speed of around Mach 5 in 2010. The Hypersonic Test Vehicle, funded by the Defense Advanced Research Projects Agency, has achieved only minimal success (briefly achieving Mach 20), while the U.S. Army's Advanced Hypersonic Weapon has one successful flight and one test failure. The Chinese WU-14 succeeded in early January 2014 with its maiden flight test but failed in its second attempt in August 2014.

China also appears ready to investigate scramjet technology, which makes sense for reasons that both the United States and Russia have done so, albeit with very modest success. Technical reasons for China to do so probably include the extremely high speeds (Mach 12 to 24 in theory) these vehicles could conceivably achieve. In July 2014 a press report disclosed that a technical journal in China had reported on research related to a hypersonic cruise missile. The journal included a line drawing of vehicle appearing to be a copy of NASA's X-43 scramjet test vehicle.<sup>51</sup> The extent to which China has achieved anything beyond copycatting to demonstrate interest or intention remains to be seen. At the moment, neither the United States nor China appears close to deploying either hypersonic glide vehicles or hypersonic (scramjet aided) cruise missiles.

When discussing (especially) scramjet-aided cruise missiles and even hypersonic glide vehicles, it is useful to recall the past efforts in pursuit of developing similar systems. Hypersonic cruise missiles would be expected to take off and land from runways and be anywhere around the world in one to two hours. The idea for such a space plane has been around since the 1950s.<sup>52</sup> President Ronald Reagan accelerated the push in his 1986 State of the Union Address to Congress, yet his director of the Strategic Defense Initiative, Henry Cooper, told a congressional panel in 2001 that after the expenditure of some \$4 billion on the development of the space plane concept from the early 1970s to the end of the 1990s, the only thing produced was "one crashed vehicle, a hangar queen, some drop-test articles and static displays."<sup>53</sup> Both the United States and China face extremely stiff challenges in dealing with engine system dynamics, development of advanced lightweight high-temperature materials, and appropriate cooling technologies to cope with an extremely stressing aerothermal environment.<sup>54</sup>

## 6. The Prospects of Sea-Based Land-Attack Cruise Missiles

The likelihood that China will develop and deploy LACMs on ships or submarines is high over time. The chief reason why was captured succinctly by strategist Albert Wohlstetter in September 1994, much before the widespread proliferation of sea-based LACMs had begun:

"They might be launched from concealed land locations at modest distances from their targets; or brought within range and launched from freighters, diesel or nuclear-propelled submarines or other boats so numerous and so varied that they would be hard to distinguish and track.

<sup>51</sup> Bill Gertz, "Report Reveals Chinese Military Developing New Scramjet-Powered Hypersonic Missile," *Washington Free Beacon*, July 10, 2014, <http://defence.pk/threads/report-reveals-chinese-military-developing-new-scramjet-powered-hypersonic-missile.323220/>.

<sup>52</sup> The first publicly acknowledged program, in 1957, was the U.S. Air X-20 Dyna-Sour, which was supposed to be launched vertically off the ground and then glided back to earth for landing. The current hypersonic cruise vehicle would be expected to operate between 30 to 50km altitude.

<sup>53</sup> Testimony of Henry F. Cooper to the House Subcommittee on Space and Aeronautics Committee on Science, October 11, 2001. Cooper largely placed blame on Pentagon management inefficiencies for the program abysmal performance.

<sup>54</sup> For an American view on such hypersonic challenges, see David M. Van Wie, Stephen M. D'Alessio, and Michael E. White, "Hypersonic Airbreathing Propulsion," *Johns Hopkins APL Technical Digest* 26, no. 4 (2005), pp. 430-436.

Such ‘two stage’ delivery of cruise missiles could present a threat here at home as well as threats to our forces or allied forces or civilians abroad. Moreover, they might be part of a serious but isolated terrorist threat, or they might be one important component of a widespread military attack.”<sup>55</sup>

The multiplicity of launch options will support strong Chinese incentives to investigate and eventually implement LACM launch options from surface ships and submarines, notwithstanding the comparative advantages that the U.S. Navy possesses in undersea warfare. Ground-launched LACMs will remain a strong competitor; while they do not offer the multitude of options Wohlstetter speculated about, they remain highly survivable due to their mobility and the inherent challenges of detecting and executing attacks against highly mobile missiles moving and hiding over China’s land-mass. Perhaps the most important impact that China would achieve by pursuing sea-based LACM launch options would be broadening the overall reach of their LACM strike options that would eventually come from gaining experience in undersea warfare. A timeframe of five to ten years would seem a reasonable estimate, assuming serious attention is paid to achieving undersea and surface-based operational proficiency.

## 7. Short-Range Ballistic Missile Buildup

My assessment of the buildup of China’s ballistic missiles facing Taiwan is addressed in section 2 of my testimony. A few additional comments amplifying on this threat are in order. First, Taiwan’s deployment of Patriot missile defenses in the 1990s focused on protecting three population centers rather than air bases, no doubt for political reasons. This left air bases highly vulnerable to Chinese ballistic and especially LACM threats.<sup>56</sup> Taiwan’s more recent purchases of Patriot missiles, once they are fully deployed by mid-decade, would conceivably provide some minimal degree of protection, and thus deterrent value, for Taiwan’s air force.<sup>57</sup> Taiwan has also invested \$1.4 billion in its Surveillance Radar Program (SRP), which is designed to provide early warning against both ballistic and cruise missiles. That investment will only manage to improve Taiwan’s missile defense program if China decides not to attack the highly vulnerable SRP ground-based large phased array radar, which frankly is inconceivable were war to break out between China and Taiwan. There are claims also that China’s new phased array radar can readily jam the SRP.<sup>58</sup> Taiwan could still depend, however less effectively, on its Patriot battery’s ground-based radar to provide support for intercepting ballistic missile threats, but far less so for low-flying LACMs due to the limitations that ground-based radars face when confronting such threats. Simply put, without a more survivable airborne platform or less preferably a more vulnerable aerostat providing support to ground-based Patriot interceptors, Chinese LACMs will have a relatively free ride to their intended targets.<sup>59</sup>

## 8. Technological Inputs for China’s Missile Developments

There is little question that China has needed to look for significant outside sources of know-how in

<sup>55</sup> Foreword to K. Scott McMahon and Dennis M. Gormley, *Controlling the Spread of Land-Attack Cruise Missiles* (Marina del Rey, CA: American Institute for Strategic Cooperation, 1995),

<sup>56</sup> This is because Patriot’s ground-based radars have horizon limitations against low-flying threats such as LACMs. This was demonstrated during the initial phase of Operation Iraqi Freedom in 2003 when Iraq’s surprise use of cruise missiles went undetected but contributed to several friendly fire incidents. See Gormley, *Missile Contagion*, chapter 7.

<sup>57</sup> On Taiwan’s missile defenses, see Ed Ross, “Taiwan’s Ballistic-Missile Deterrence and Defense Capabilities,” *Chief Brief* 11, no. 3 (February 10, 2011),

[http://www.jamestown.org/programs/chinabrief/single/?tx\\_ttnews%5Btt\\_news%5D=37489#.VQ2NAig2VjB](http://www.jamestown.org/programs/chinabrief/single/?tx_ttnews%5Btt_news%5D=37489#.VQ2NAig2VjB).

<sup>58</sup> “Taiwan’s early warning radar can be jammed by China,” Asia-Pacific Perspective, <http://ap-perspective.blogspot.com/2014/06/taiwans-early-warning-radar-can-be.html>.

<sup>59</sup> For more details on the challenges of intercepting LACMs, see Gormley, *Missile Contagion*, pp. 163-174.

fashioning its military-technical approach to missile development, particularly with regard to LACMs. China's long-term quest is to build a wholly indigenous defense industrial base that would benefit greatly from joint ventures in the civilian sector, an ever-growing body of intellectual capital derived from students studying abroad in the best engineering universities, and extensive military and civilian efforts at industrial espionage. Russia and, to a lesser extent, Israel, Ukraine, and Belarus have satisfied near-term requirements for weapon systems, technology, and specialized know-how. After the end of the Cold War, Russia and China's needs converged. China sought the most advanced technology it could acquire. Russian defense industries, faced with disappearing state subsidies, found a convenient lifeline in foreign military sales. With Moscow's governance over such matters questionable at best, China made deals, including licensed production of the Su-27 fighter, that would never have occurred in former times.

Amid virtual chaos in the Russian defense sector, China reportedly obtained Russian consent to recruit a cruise missile research and development team.<sup>60</sup> Other unconfirmed sources in Taiwan also believe that China successfully recruited between 1,500 and 2,000 laid-off scientists and engineers and located them at a factory, named Xinxin, in Shanghai, where they work with Chinese missile specialists on intermediate-range cruise missiles, or "imitated versions of the Kh-55."<sup>61</sup> It remains doubtful that Russia provided China with either the Kh-55 or its turbofan engine during this period. Had it done so, there would not have been compelling reasons for China to have illegally procured six Kh-55 LACMs in 2000 from Ukraine. But it does appear plausible that Russian personnel did furnish China with scientific and engineering know-how that advanced their LACM ambitions in the early to mid-1990s.

China routinely steals technology when targets of opportunity become available. A notable success is the acquisition of six Russian Kh-55 LACMs from Ukrainian and Russian sources. Reverse engineering, even with its shortcomings with respect to a complex system like a turbofan engine, should have proven valuable already. China's acquisition and subsequent exploitation of recovered Tomahawks kindly furnished by Pakistan has probably also helped, with perhaps some reciprocal benefit flowing back to Islamabad in the form of the Babur LACM, or at least components thereof.

And then there are failures, as when Ko-Suen "Bill" Moo, a Taiwanese national, who worked for American defense contractor Lockheed Martin in Taiwan, was caught in 2005 by U.S. Customs agents in a sting operation attempting illegally to export military items to China. Moo and a French national were charged by federal prosecutors with attempting to purchase an F-16 jet engine, cruise missiles, and air-to-air missiles for China. Moo provided an undercover Customs agent with documents showing specific Chinese interest in acquiring the AGM-129 LACM, which is capable of carrying a nuclear warhead to a range of 3,700km. Developed in the 1980s to penetrate thick Soviet air defenses, the AGM-129 is a highly advanced stealthy cruise missile that was originally slated to remain in the U.S. nuclear inventory until 2020 but is being retired early as part of U.S. nuclear reductions required under the Moscow Treaty of 2002. Moo had deposited \$3.9 million in a Swiss bank account to purchase the weapons and, in a final meeting with Customs agents to discuss exporting the F-16 engine to an airport in China, Moo wired \$140,000 for shipping fees to a Miami bank account. Moo pleaded guilty in May 2006 to acting as a covert agent for the Chinese government.

## 9. Sophistication of Chinese Production Processes

To compensate for weaknesses in its indigenous production processes, China has embraced a multi-pronged strategy centered on exploiting joint ventures with foreign companies to acquire critically needed

<sup>60</sup> Stephen J. Blank, *The Dynamics of Russian Weapon Sales to China* (Carlisle, PA, Strategic Studies Institute, 1997). Blank indicates that Chong-Pin Lin of the American Enterprise Institute in Washington, D.C. was the source of this information, which dates to August 1995.

<sup>61</sup> "Current Research and Development of Cruise Missiles in the PRC," *Taipei K'ungchun Hsueh-shu Yueh*, Issue no. 588 (internet version, in Chinese), February 27, 2006 (FBIS Translated).

know-how. With the liberalization of export controls on dual-use products and technologies that occurred at the end of the Cold War, China accelerated efforts to acquire production processes for U.S. jet engines. In 1996, for example, Pratt and Whitney Canada, a subsidiary of U.S.-based United Technologies, established a joint venture with China's Chengdu Engine Company to manufacture aviation parts. Chengdu not only manufactures components used in Boeing aircraft, but also for the PLA Air Force's WP-13 turbojet engine that powers the F-8 fighter.<sup>62</sup> This is one among many U.S.-Chinese joint ventures in areas where China could conceivably gain valuable production processing knowledge by working with top-notch U.S. engines manufacturers. Other prominent examples include a 2003 joint venture between General Electric and Shanyang Liming Aero Engine Corporation to co-produce the CF034-10A jet engine for one of China's regional jets and the much more direct acquisition of Russian know-how to assist China's development of the WS-10A turbofan engine for China's J-10 and J-11 version of the co-produced Su-27.

**Disclaimer:**

In my oral testimony in response to Commissioner Tobin's question on stepping back from the INF treaty, I mistakenly observed that each of the four SSGN Ohio-class submarines in the U.S. Navy's arsenal could carry a maximum of 616 Tomahawk cruise missiles. The correct number is 154 Tomahawks for each of four SSGN Ohio-class submarines. It is important to note—as I did in response to Commissioner Tobin's question—that SSGN Ohio-class submarines are by no means the only US Navy vessels capable of launching Tomahawk cruise missiles. Ample space exists for other US submarines and ships to launch several thousand Tomahawk cruise missiles in a major military contingency.

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<sup>62</sup> *U.S. National Security and Military/Commercial Concerns with the People's Republic of China*, Select Committee of the United States House of Representatives, 105<sup>th</sup> Congress, 2d Session, Report of the Select Committee on U.S. National Security, submitted by Mr. Cox of California, Chairman Report 105-85 (Washington, D.C.: U.S. Government Printing Office, January 3, 1999), chapter 10.



## PANEL I QUESTION AND ANSWER

VICE CHAIRMAN SHEA: Thank you very much, Mr. Gormley. Thank you to all our witnesses for their great testimony.

I'm going to start off with a leading question. Just to lay the groundwork here, could you--this is a factual question--what is the inventory of ballistic missiles, Chinese ballistic missiles, to the extent that we know, and cruise missiles? And I assume these missiles do not include munitions fired from ships and aircraft?

So could you just give us the numbers and lay the groundwork for us? Anybody want to--

MR. STOKES: I don't know, but there have been statements, for example, in terms of short-range ballistic missiles of 1,300. But I would make one point. To give an example, bear in mind the Second Artillery, with a key emphasis on the word "Artillery," and you look at, for example, North Korean Artillery, I'm not sure if the number of shells that North Korea has is quite as important, for example, as the artillery pieces that they have, in other words, the launch platforms.

And if you look at the number of launch platforms, that is maybe sort of a basis for starting, and you have six commission brigades, for example, opposite Taiwan, and of course you add in the DF-21C or DF-16 or other conventionally capable missiles, of the six, you take six, and then there's going to be six brigades underneath, or six battalions, 36, multiply that by two, and that will give you a number of your actual launchers.

And then in terms of at least two reloads per launch platform, I'm going to guess probably more, maybe three. There actually may be three launchers, three companies, launch companies per so let's say at least 1,300 ballistic missiles on--

VICE CHAIRMAN SHEA: Short range.

MR. STOKES: Short range, yes.

VICE CHAIRMAN SHEA: Okay.

MR. STOKES: Then when you go to the DF-21C, there's one relative, one with some degree of confidence, one brigade deployed up in Shandong, possibly at least one other up in Liaoning Province.

VICE CHAIRMAN SHEA: Okay. So I've seen estimates around 1,800, all types of ballistic missiles. What about cruise missiles? How many cruise missiles do they have?

MR. STOKES: I'll let Dr. Gormley handle the cruise missile thing. But by calculations a couple years ago, it appeared that they're introducing about a hundred new land-attack cruise missiles into the inventory a year. At a certain point, they're going to reach whatever their table of organization and equipment, their limits, but I'm not clear exactly the number--what--300 or something like that, but I'm going to guess more.

MR. GORMLEY: I've seen the number 200 to 500. But I really want to underscore the importance of the point that Mark made about what I'll refer to as pulse power. Pulse power comes not from the total number of missiles in China's inventory but from how many can be fired at any one time, So just don't look at total missile numbers but also look at the number of launchers.

VICE CHAIRMAN SHEA: Okay.

MR. GORMLEY: And then have reloads. So it's what the Soviet Union used to call intensity of fire within the particular period of time.

VICE CHAIRMAN SHEA: Okay. So the Chinese have developed this anti-access/area denial tactic or strategy, whatever you want, and missiles are essential to this. So they have 1,300 short-range missiles, maybe 1,800 of all ranges. They have 300 cruise missiles. This is, these are all land-launched.

MR. GORMLEY: These are land-attack cruise missiles.

VICE CHAIRMAN SHEA: Okay. So then on top on that, you have missiles fired by airplanes and by naval vessels. Can you quantify that? I'm just trying to get a sense of--is that on the order of four or five times the magnitude of firepower than the initial ground-launched ballistic and cruise missiles?

MR. GORMLEY: Uh-huh.

VICE CHAIRMAN SHEA: What kind of firepower can the airplanes and the surface combatants, the naval vessels, add to the initial missile attack?

MR. STOKES: If you look at, for example, the air force with air-launched, air-launched land-attack cruise missiles, I don't know the answer on that one, but there's going to be a set, a set number that they would have. That one hasn't been broken out as much as detail as the Second Artillery has.

MR. GORMLEY: Yeah. And there are no land-attack cruise missiles, as far as I know, deployed on Chinese naval vessels. But the Commission asked the question about whether or not China will turn to placing land-attack cruise missiles on ships, and my response in my written testimony was that I think it's probably inevitable that they would go down that path. To some degree, if I were a Chinese planner and thinking about the pros and cons of doing so, I would think that my opportunity to survive for an extended period of time might be better on the land than on a Chinese vessel today given the performance of the U.S. undersea fleet.

So they might well wait until some improvements take place with regard to the survivability of their ships before they turn to ship-launch systems.

And one final point, when we're talking about cruise missiles here, we're talking about land attack missiles. The Chinese have enormous quantities of anti-ship cruise missiles that present a significant threat. Andrew Erickson and I argue in a recent book that there should be growing concern about swarms of anti-ship cruise missiles used particularly against critical targets, including carriers, and so that's a worrisome area that deserves attention.

VICE CHAIRMAN SHEA: Well, thank you.

Doctor.

DR. YOSHIHARA: If I could add a couple of points. I think you raise a very important point, which is the interaction and the interplay between anti-ship cruise missiles and the land-attack cruise missiles/ If anti-ship cruise missiles can, for example, keep U.S. and Japanese Aegis-equipped destroyers at a distance, then they will not have the ability to shoot down the bombers that are armed with the land-attack cruise missiles for those follow-on attacks.

MR. GORMLEY: Yeah.

DR. YOSHIHARA: And so keeping the U.S. out with such defensive layers would make our defense of those bases that much more complex.

There is another point I wanted to make concerning the guessing game about the numbers. Based on the information that's available about the DF-21s, you have to be careful how you parse the numbers because what we now know is the aggregate number. But, you have to break that down into the nuclear capable ones, the ones that are conventionally armed, and the ones that are designed for anti-ship. So you have to guess what the proportion of that missile size is.

One last thing is that if you find that there is a one-to-one ratio between missiles and launchers, then you might be able to guess the intent. They plan to only use it once, and it might be something that they want to use at the outset of a campaign, fire that off to suppress and destroy bases.

VICE CHAIRMAN SHEA: Thank you very much.

Dr. Tobin.

HEARING CO-CHAIR TOBIN: Thank you.

All of our witnesses today have spoken about the INF Treaty, and Mr. Stokes, you tee-ed that topic up in your remarks earlier. As you know, this Commission is responsible for not just reporting to Congress but also for delineating recommendations on what the U.S. Congress should be doing.

So given the fact that there is the INF Treaty, that Russia has not heeded, what are each of your thoughts on diplomatically and politically if we were to step back from that, how would we do it? How would that play out in a straightforward way? And how do you think it would fare given our partisan Congress?

Thank you.

MR. STOKES: Well, first, the INF Treaty arguably is the most successful arms control agreement in history when you eliminate an entire category and class of weapon systems but with the basic understanding that a general--and there are some practical reasons--but a general assumption that went into the INF Treaty about the destabilizing nature of land-based missile systems, because of escalation aspects and because of some of the problems of what it naturally leads to, which is

counterstrike, which is interdiction, counter-battery fire.

One of the problems with China's missile buildup is that it took place in this vacuum created by the INF Treaty, and that the Chinese missile buildup, particularly focused against Taiwan, has been done without almost any political backlash, without any political complaints.

As far as I know, the last time there's been a public sort of criticism of China's missile-centric strategy vis-a-vis Taiwan, it's been many years, maybe one mentioned in 2007, maybe 2006, and very, very rarely do you see any sort of call, for example, for the PLA to withdraw their missile forces.

In 2007, there was a joint statement, of course, after February, in 2007, when the Russian foreign minister actually did threaten to withdraw from the INF Treaty for a couple reasons. One of them is because it's not global. Other countries aren't adhering to the same principle. And there was in the U.N. General Assembly, I believe 61, in October of 2007, there was a joint statement by both President Putin and President Bush calling for a global INF Treaty.

Now if you're in the PLA, of course, you're going to look at that and you're going to say no way, but the PRC and the Chinese Communist Party was quite silent on the issue.

But at a minimum, there's one approach to dealing with the missile problem, and that's military in nature, but in some way at least some call upon some kind of a missile control regime, one that's just purely regional in nature, or some study done on INF on how it can possibly be revised to result in some sort of an exception in the Asia-Pacific region, in particular, to me is worth studying and worth considering, linked with some degree of criticism against China's missile buildup or force buildup opposite Taiwan.

Bear in mind in a political sense, President Ma, ROC President Ma, even before he became president, actually called upon China to withdraw their missiles as a possible precondition for entering into political negotiations with the Chinese Communist Party, and he called a number of times for withdrawal of missiles as a precondition.

That's backed off for awhile, but my understanding of the reason why the United States doesn't take a more active approach to this in terms of calling upon is maybe a perspective that this is an internal issue, and therefore because it's an internal issue, then the PLA is going to say it's our internal right, we have a right to maintain this capacity because in their perspective Taiwan is an integral part of China, a province of China, People's Republic of China, that is, but, in short, some degree, some action to delegitimize in a political sense China's reliance upon ballistic missiles, systems that we've considered to be fundamentally destabilizing.

HEARING CO-CHAIR TOBIN: So you would consider, you would urge, a careful study of the INF Treaty to look at potential revisions that would support us in a successful way--

MR. STOKES: Yes, ma'am.

HEARING CO-CHAIR TOBIN: --in the Asia-Pacific and ideally some criticism on what exists now that has filled that vacuum?

MR. STOKES: Yes, some political positions, and also perhaps some studies on the possible utility of advanced systems that have some, that could be forward-based, land-based, from a U.S. perspective in the region for possible application in a scenario for our own deterrence abilities. For example, notionally, you could say a Pershing-3, a new Air Force land-attack cruise missile, actions that could be considered to be destabilizing, but at the same time the political value, I think it's more important in terms of delegitimizing, in terms of pointing out the destabilizing nature of this type of reliance upon land-attack missiles that have taken and the buildup that has taken place in the vacuum of the INF.

HEARING CO-CHAIR TOBIN: Thank you.

Dr. Yoshihara, your thoughts on the INF Treaty?

DR. YOSHIHARA: Yeah, if I could add a Japan angle to the discussion.

HEARING CO-CHAIR TOBIN: Yes.

DR. YOSHIHARA: I'd like to make a somewhat controversial statement, which is to think about Japan's role in procuring its own counterstrike options. If Japan is under this increasing missile threat, then that's certainly something that should be put on the table for consideration, whether Japan develops its own set of cruise and ballistic missiles as a counterforce option.

Now what's interesting is that the Japanese have deliberated on counterforce options in the North Korean context. They've, in fact, investigated whether it passes the constitutional test for Japan to possibly attack enemy bases. I think the conclusion is that if Japan finds that there's an imminent missile threat from an enemy base, then it is within Japan's constitutional right to take action to destroy the threat that's emanating from that base.

So at the very least from a legal constitutional perspective, Japan could potentially consider counterstrike options. I'm happy to discuss the pros and cons about that in a subsequent question.

HEARING CO-CHAIR TOBIN: So it would not be considered self-defense? The constitution--

DR. YOSHIHARA: It would be very much considered--

HEARING CO-CHAIR TOBIN: Yes.

DR. YOSHIHARA: --a self-defense action.

HEARING CO-CHAIR TOBIN: Good. Good.

DR. YOSHIHARA: If the threat is proved to be an imminent threat and can be proved as such.

HEARING CO-CHAIR TOBIN: Yes. Thank you.

And Mr. Gormley, please.

MR. GORMLEY: I am without question averse to any effort to drop the INF Treaty, particularly for reasons of arriving at the conclusion that the only way we can deal with the broad China threat is to have more extensive immediate-use firepower in the region to deal with a military contingency vis-a-vis China.

I think that is shortsighted because it adds fire to the trend toward preemption, and thus my remarks initially today suggesting that the best approach is one that is--not exclusively by any means--a defensive one; that is improved missile defenses. We have significant growth in ballistic missile defenses, but my argument is that we ought to do the same with respect to modest inventories of land-attack cruise missile defenses, and that would have, I think, a less provocative, less preemptive-oriented solution to the problem.

And we already have enormous firepower we need to appreciate. We have enormous firepower in the guise of Ohio class submarines that carry 616 land-attack cruise missiles altogether on each. We routinely have two vessels, or over 1,200 land-attack cruise missiles, just in those two vessels. Two additional vessels could be moved from elsewhere into the region to double that number of systems for a true war contingency in the region.

In addition to that, we have a growing number of land-attack cruise missiles being deployed on ships in the region. So we have enormous firepower to bring to bear in various contingencies in the region. It thus seems to me that to lose the benefits that have flowed from eliminating an entire class of missiles would be shortsighted. That said, I surely would endorse Mark's comment about looking closely at how we might broaden the regime.

Frankly, my sense is that we have neglected really pushing or thinking about globalizing the INF Treaty because the organizations within the State Department that are responsible for regimes like the Missile Technology Control Regime that would have to then move toward working on the INF Treaty would do a disservice to the MTCR as a consequence, unless we increased the capacities within the State Department to deal with these issues.

I testified in 2004 before a House committee on this very issue where that question arose: the capacity of the government to deal with these issues, and the State Department is ill-prepared to deal with it. If they were asked to look at that question in a serious manner, they simply don't have the staff today to do so. So I would encourage you to raise that question if indeed you're focused on the continuation or globalization of the INF Treaty.

HEARING CO-CHAIR TOBIN: Thank you all.

VICE CHAIRMAN SHEA: Thank you.

HEARING CO-CHAIR TOBIN: And if we need to, we can come back to the topic for even more discussion.

VICE CHAIRMAN SHEA: Senator Talent.

COMMISSIONER TALENT: Thank you and thank the three of you. This is a really important

hearing, and your testimony was very helpful. There are a lot of questions I could ask, but I don't want to hog the microphone.

HEARING CO-CHAIR TOBIN: Go ahead.

VICE CHAIRMAN SHEA: Go ahead.

COMMISSIONER TALENT: Okay. Let me do two. First of all, again, sort of for the record, would any of you doubt that the main object of China developing this very large and lethal inventory of different kinds of missiles is to be able to have and leverage the capability to deny American forces access to their near seas?

I understand there's other, you know, Taiwan, Japan, but I mean basically they feel, do they not, that in order to advance what they define as their vital national interests, they need this capability, not necessarily because they want to use it, but because they want to leverage it? So I mean is there any doubt on that?

And then the second point, I was--I thought of this because of Mr. Gormley's testimony, but all of you, please, adopt it or answer it. I agree, Mr. Gormley, with your idea that defensive systems, the cruise and ballistic missiles, would be the most preferable response because the least escalatory, right, and probably the one, the response that would have the most deterrent potential, that, in effect, it's a technological answer to a more strategic threat, assuming we could do it.

If China really doubted the ability of a substantial number of these missiles to get to the target, the whole chain, escalatory chain, breaks down at the beginning; right? So I really, first of all, is that what you're saying?

And second, what frustrates me, though, is you said, well, given the financial issues, we can't really do this, we have to do some modest things.

Now in terms of our potential recommendations to the Congress, if the missile defense and various kind, theater missile has that kind of potential, isn't this something Congress ought to prioritize in terms of spending? I mean it seems to me, oh, yes, this has the potential not to solve the whole problem, but to really reduce the risk in the region, but we can't do it because instead of spending \$10 billion, we'd have to spend \$20 billion a year. I mean address that issue if you would. I mean talk about the potential of it and forget for a second about the financial constraint.

And anybody who wants to address it, both questions.

MR. GORMLEY: Let me start on your last question, and I think you do raise a critically important point, particularly as I started out in talking about this, we've been looking at this issue for a long, long time. It began in the late '80s in anticipation of precisely the problem we're facing today, and we've done nothing about it.

And there are reasons why we've done nothing about. We've failed in a solution--the E-10 program back in 2010 was canceled because we tried to stuff too much electronics into one aircraft solution. And the broader question that we have to deal with if we truly want more than a so-called modest defense is to reexamine a more appropriate response that would provide the robustness that you're driving at.

And one important thing I'll take from this is to go back to the folks who were going to examine this at the Defense Science Board this summer to examine it in that context of let's revisit the issue of a solution for the problem and look at the costs independent of the issue of stringency and all the things that are raised in the document I quoted earlier in my testimony. So that's critically important.

Now having said that, I'll only say, again, that the value in that modest approach is to complicate the beginning of an attack because that, in my view, is most important because you capitalize on the success of collapse in the initial phase of any military operation. If you can confuse the Chinese in terms of dealing with the inherent complications of getting all the joint operators working in tandem on a complex military problem, then you raise the potential for collapse on their part or confusion on their part that promotes delay in their actions from exploiting the advantages that they have inherent in their ballistic and cruise missile arsenal.

So I at the risk of saying that even modest defenses can have value, I do think your point is critically important, and we ought to ask both questions. I mean how can we get a more robust solution

because that's not going to be the only area in which land-attack cruise missiles can come to haunt us. Consider what Iran is doing today with their land-attack cruise missile programs.

So this isn't going to go away. It's going to be a future problem that's going to grow in its robustness.

DR. YOSHIHARA: I agree with your first statement, that China's key objective is to give it strategic leverage with this missile modernization program. Of course, if you think about it--

COMMISSIONER TALENT: Leverage over the United States is what I'm--obviously, there's impacts on Taiwan, but, in other words, its aim, its object and its aim is at America's ability to project military power in China's near seas.

DR. YOSHIHARA: Yes, I agree.

COMMISSIONER TALENT: Okay. Thanks.

DR. YOSHIHARA: In peacetime, as China conducts non-military operations with its coast guard vessels, the Chinese believe that having the military backstop gives China the confidence to do all of these peacetime activities.

So China's military power, whether they're conventional missiles or other military capabilities, is not simply for wartime contingencies. But that it serves as a backstop to China's ability to coerce its neighbors in peacetime.

I also wanted to say a few things about s base hardening. It's not cheap obviously. It can cost tens of millions, even up to hundreds of millions, of dollars to harden hangars, et cetera, and so there are clearly tradeoffs involved.

But in the process of hardening, you get to protect possibly billions of dollars' worth of equipment, driving up the cost of Chinese offensive action against those bases, and therefore deprive the Chinese the temptation to engage in a first strike or preempt. I think we need to look at the whole kill chain that allows China to conduct those military strikes.

We have to think about the point of origin from where the missiles are launched, whether it's from bases or from aircraft or from ships, all the way to when the missiles impact the target. I think we need to think about each segment of that process and to figure out what kind of investments we need to deal with each segment of that threat.

MR. STOKES: Maybe start with the second question, which is more perhaps military in nature in terms of how to respond to this challenge, and then follow it up with actually a little bit more of a political issue in terms of directing toward the United States.

Defending against missile threats, long-range precision strike threats, I guess a basic doctrine, different approaches, hardening, there's passive defense, so to speak. There's command and control, communications, ISR detection. Then there's, of course, active defense, missile defenses, for example, whether it's a PAC-3 or THAAD or sea-based missile defenses, whether it's terminal missile defenses or mid-course.

But, in my view, the most fundamental approach in terms of cost effective approach to countering the missile challenge, theater missile challenge, is interdiction on the ground, and not necessarily interdiction, tell-plinking, but it's to be able to leverage the kinds of complications that Dr. Gormley already addressed in the command and control system, the command and control logistics, the communications supporting that, because I agree in full that it's difficult to pull something off. The coordinated strikes, multi-action strikes is more difficult than it may seem. That's a question about how many can they get off at the same time to have an effect.

And just imagine putting friction in that system or, at least--not necessarily to be used-- but at least demonstrating capacity to interdict the command--

COMMISSIONER TALENT: Would that require us to attack their ISR, you know, some kind of kinetic attack--

MR. STOKES: Yes, sir.

COMMISSIONER TALENT: --or it could be--okay.

VICE CHAIRMAN SHEA: Sea bound.

MR. STOKES: Yes, sir. Well, bear in mind from a purely military perspective, interdiction, if

you define the battlespace as that area from which operations are conducted in the battlespace, of course, wherever their forward base command and control system is with some delineation, the concepts that have been affiliated with air-sea battle, which to me is not really a strategy--it's more sort of an internal DoD thing in terms of use of resources--the notion of interdiction, deep interdiction, against targets in China, is nothing new.

It's, as far as I know, ever since we had the U.S.-ROC Mutual Defense Treaty, there's always been that latent capacity that's back there to interdict, whether it's the United States or treaty allies, in this case, Taiwan military, and bear in mind, there's just one other country that actually thinks in detail about interdiction besides the United States, and it's Taiwan. It's not Japan, as far as I know, South Korea, and against China, there's no other country, no other defense besides Taiwan that has this sort of similar approach to defense.

And so as China has built up this capacity, naturally you're going to have more thinking that would be done about how to have interdiction as part of a broader approach on defending our assets and assuring the ability to operate within the region, which leads me to the second, the second question.

Yes, I think, of course, the United States from--it's really the perceived ability of the United States to get into and operate within the region that's important because the perceived ability may not be the same as the real capacity.

And so with the idea if you can at least demoralize or at least convince the American public and Congress and others that it's too difficult, and that to develop and invest in the capabilities that are commonly associated with A2/AD, there's been some calls, for example, by saying that we should completely discard and not develop any interdiction capability whatsoever, which, in effect, is a unilateral disarmament measure.

It's a public unilateral disarmament to not even have, just basically to do away with these capabilities that already exist and could exist in the future, but it's a perceived ability to project power in Washington, and then having that perceived ability project back into the government, the policymakers, and public perceptions on Taiwan, in particular, and perhaps Japan, but primarily, when you think about these sort of major scenarios, when you think about the various scenarios in the Asia-Pacific region, it's only a Taiwan scenario that has the salience of U.S. interests because in Taiwan, we're talking about people, we're talking about a democracy.

We're not talking about water, space, and freedom of navigation and things like this, and small islands, and so Taiwan is the one, is the scenario that probably has the capacity. If you can convince the Taiwan government and Taiwan people that U.S. ability--Taiwan Relations Act, two parts. One is provision of defense articles and services; the other one is maintain the capacity to respond, use of force and other forms of coercion. Maintain the capacity--you think about all kinds of ways you can do it, and if you can convince, the United States can convince the Taiwan people that that maintain the capacity just isn't there, then it increases the chances for Beijing to implement a coerced, using coercive persuasion to coerce a political solution for Taiwan's democratically elected leaders to buy into Beijing's definition of one China, which is one country/two systems, of which Taiwan is a subordinate element of the PRC.

And missiles and these capabilities through Washington I think have a significant impact, potential impact, on political confidence in our neighbors, or in our allies and ad hoc coalition partners.

VICE CHAIRMAN SHEA: Thank you.

Commissioner Bartholomew.

COMMISSIONER BARTHOLOMEW: Thank you.

Gentlemen, this is all very interesting. It gives us a lot to think about. I have two, two different buckets of questions so I'll ask the forbearance of my colleagues to try to get both of these out there. The first has to do with expanding the whole chain, Dr. Yoshihara, that you mentioned about, I want to talk a little bit about production or learn a little bit more about production from you, from you all.

And then the second has to do with command and control issues. The Chinese, the PLA is not at the mercy of the profit margins of defense contractors; correct? So that the research is being done by state entities. R&D is being done by state entities, and production is state-owned enterprises; correct?

MR. STOKES: [Nods affirmatively.]

COMMISSIONER BARTHOLOMEW: How difficult is it to manufacture the missiles that we're talking about today? And I'm thinking, Dr. Yoshihara, you mentioned scarce commodity, and we talk about numbers, and we don't know about numbers, but are these things that can be churned out going into a wartime context, churned out in multiples a day? Are they difficult to produce? Do we know where they're being produced? Anybody?

MR. STOKES: To start off, in terms of that whole supply chain that goes into it, it's not necessarily manufacturing, but it's the design element that goes in. It's the preliminary research to master key technologies that would be--the solid motor, for example, the guidance control and navigation systems, all the other inputs that go into that. And they're centered around design departments, design bureaus, of which there are two major ones that would be in terms of conventional missiles, one under two large defense industrial enterprises. They're used to be three.

And so you'll have a chief designer; then you'll have a program manager that's going to be a bit above. They have a dual command, what they call a dual command system, and there they would oversee the design chain, design and supply chain.

COMMISSIONER BARTHOLOMEW: The design supply chain, though, not the production?

MR. STOKES: Well, that's part of it actually.

COMMISSIONER BARTHOLOMEW: Okay.

MR. STOKES: Because you'll have part of that team that is also part of the production side. And so you'll have, in terms of the whole supply chain, you'll have a separate production facility for solid motors, two, maybe even three, but you will have, the key thing, you have the design department, and at the other end, you'll have the assembly, the assembly factories, and you'll have--at least, for example, there's one in Beijing, 211 factory, that perhaps DF-15 and its successors and other systems.

Then you have the 307 factory in Nanjing. It's another assembly place. Land-attack cruise missiles have their own assembly facility in a different part of Beijing. Perhaps overflow in--overflow in Sichuan.

The question about surging, it's not exactly clear how well they could surge. And that goes into the question of how many missiles they're producing today? Are they operating at maximum capacity?

The DF-21 to me is the key, is really one of the key sort of metrics on this. Is the 307 factory in Nanjing--the DoD, the last DoD report to Congress in which they mentioned some missile numbers, they had an incredibly low number of DF-21 missiles, which doesn't seem--there's something strange, and I don't necessarily question that, but there's some disconnect between that and the expanded capacity of 307 factory, which from 2006 more than doubled in terms of the general floor space, and it requires sort of a different sort of expert to be able to analyze floor space and people to get an idea of how many missiles they're pumping out today and how many, if they went to surge, how many they could pump out in the future.

A lot of that goes to actually overflow facilities they could have in other locations around China.

COMMISSIONER BARTHOLOMEW: Either of the rest of our witnesses?

DR. YOSHIHARA: If I could just speak about this in terms of strategy, in terms of our strategy. The DF-21s, the medium-range ballistic missiles, we know are more expensive. They're not cheap to build, and they also suffer from the problem of being one-way weapons. You get to only use it once/ That should inform our strategy in terms of imposing costs on Chinese military campaigns. If we can engage in an exhaustion strategy that's designed to diminish and accelerate the use of the missile stocks that they have in any military campaign, and we may be talking about the margins here, then we can reduce a proportion of missiles that the Chinese can use for a particular campaign.

From our perspective we should force tradeoffs on the part of the Chinese because if they have to use one missile against an unproductive target, then that's one fewer missile that they can use for other campaigns. If we can pose those kinds of challenges, then we would be engaging in a much more competitive strategy.

COMMISSIONER BARTHOLOMEW: But that posits that they can't just churn out replacement missiles in order to compensate for the missiles that we have taken out.

MR. STOKES: No, not fast.



DR. YOSHIHARA: Yeah, not, yeah.

COMMISSIONER BARTHOLOMEW: They can't? They can't. That's what you're saying? Okay.

MR. GORMLEY: If you've ever seen a solid rocket motor production facility, it's a very complex endeavor indeed, and the notion of responding in that fashion where they're just, you know, sausage is being produced is incorrect. So--

COMMISSIONER BARTHOLOMEW: But we also know where the production--we think we know where the production facilities are?

MR. STOKES: Yeah, both for the solid motors and for the final assembly plants I think there's some--I'm assuming there's some degree of confidence, and it's not a huge secret because actually they're fairly--relatively--they're relatively transparent about production facilities, and so one other very quick point on the DF-21 that makes it a little bit more complicated to come up with numbers is if they do move to production of, for example, launch-on-demand satellite launch vehicles, small satellite launch vehicles, then whether--and who those are subordinate to--it would be difficult to--if a missile is coming out of a factory, if it has a dedicated launch-on-demand sort of satellite launch capacity, or in the case of direct ascent, either a direct ascent ASAT or some sort of space intercept, whatever launch vehicle that's going to be, whether or not a plant is producing--whether or not that could be dedicated toward a strike capacity surface-to-surface, or whether or not that's going to be another use is another complicating factor.

MR. GORMLEY: Yeah, and one last point, it's also important to note that while the advantages that accrue to using solid rocket motor technology for a ballistic missile also have disadvantages inherent in issues like safe storage because in thinking back to the Soviet era, I can't count the number of catastrophic events that occurred during that period in which explosions took place because of safe storage and having the appropriate distance between packages of ballistic missiles so that you didn't have a catastrophic event taking out your entire facility.

So, in many respects, that requires a facility much larger because you have to have safe distances for your steady state storage system, unlike liquid fuel systems, which don't become toxic until you bring them into the field and go through this elaborate process of fueling and using the missile.

COMMISSIONER BARTHOLOMEW: Okay.

MR. GORMLEY: Which, by comparison, is much more--I mean you want to try to eliminate that because it creates vulnerabilities for you in the field.

COMMISSIONER BARTHOLOMEW: Do we have time? Okay. So on command and control, last week Senator Talent and I served on a panel where we were talking about U.S.-China military-to-military exchanges, and I just find myself wondering--this is just a little bit off topic here but related to it--that are you concerned that the Chinese government, that the PLA, will learn what it needs to learn about command and control from U.S.-China military-to-military exchanges?

MR. STOKES: I mean it's, I have confidence in our military leadership to be able to protect classified information. I mean it's going to always be a concern, but I would put that concern second to another concern when it comes to mil-mil relations. When we think of mil-mil relations, we think purely about our formal what we call state-to-state or government-to-government exchanges that we have with the PLA, active duty officers, senior officers, in exchanges with their active duty guys.

I'm not sure if that same sort of approach, that fundamental concept, is shared in the People's Republic of China that has a fundamental approach to foreign policy that consists of three elements, is integral to foreign policy, influenced in part, and actually learned in part from the former Soviet Union, in which foreign policy, to include mil-mil, has three components, which is government-to-government, or state-to-state, Party-to-Party, and then people-to-people.

When I say people-to-people, we're talking about those that are on the second echelon of the Pentagon. We're talking about other retired military, senior retired military officers. We're talking, for example, members of the Defense Policy Board, members of the Defense Science Board, that are not necessarily active duty but retired. We're talking about--

COMMISSIONER BARTHOLOMEW: Or track two?

MR. STOKES: Excuse me?

COMMISSIONER BARTHOLOMEW: Track two?

MR. STOKES: People will call that track two. And even then, it's not necessarily on the intel that I don't have--it's really the ability to be able to influence operations.

COMMISSIONER BARTHOLOMEW: Isn't it also organizational efficiencies? Some of that stuff is not classified. It is about organizational efficiencies.

MR. STOKES: True, the intangibles certainly they can learn from, but I would say the primary goal mil-to-mil is to shape perceptions, to shape policies.

I mentioned in the introductory remarks that they have two capabilities that we don't have, one of them political warfare influence operations. It's very specific about, if you can imagine an organization that has the same stature as the National Security Agency, DIA, CIA, a major organization that's equal, they have an entire organization that one could call nothing short of a deterrence department, equal in stature, equal in grade to the Third Department, you know, the Technical Reconnaissance Department, equal in stature to the General Staff Department Second Department, their DIA, and dedicated to nothing but manipulating perceptions, influencing.

Deterrence department--they actually institutionalize--when we think about deterrence, it's kind of ad hoc. It's kind of like I think I know what deters the PLA. They have actually a very, very detailed organizational structure that understands strategic psychologies, understands connections between senior officers and retired, family, anything and everything, connections with business--guarantee that would be a leverage point to be able to influence perceptions in order to create an environment that would be more conducive to the interests of the Chinese Communist Party and ensure a world safe for the monopoly that the Communist Party has on power. And this is a very, very important part.

COMMISSIONER BARTHOLOMEW: Dr. Gormley.

MR. GORMLEY: At the risk of sounding like a pedantic academic, let me make one remark that I think is relevant to the issue of command and control and to any function related to engendering the kind of confidence you would like to achieve to master any particular technology that's relevant to warfare, and that is the distinction between tacit and explicit knowledge.

What China desperately needs is to learn by doing, and to learn by doing in environments that are as close to warfare, if not warfare in itself, and learning by doing is gathering the experience that's not written down. You can't read it in a manual and become proficient at it. You've got to go out and do it.

So that is critically important. Having these kinds of endeavors in which you chitchat around and talk about command and control systems in a very superficial way is not going to have any kind of consequence, in my view, other than perhaps increasing the state-to-state relationship that military organizations benefit from.

COMMISSIONER BARTHOLOMEW: Dr. Yoshihara, anything to add?

DR. YOSHIHARA: I would only add from the naval perspective that the Chinese navy has demonstrated itself as a learning organization. If you think about Chinese naval operations around the Western Pacific, including naval flotillas operating through the first island chain into the open waters, beginning in 2008, what began as sporadic forays have become much more complex operations, and that's because they've been doing it--

MR. GORMLEY: They do it.

DR. YOSHIHARA: Right, they've been doing it. And by doing it, they're learning, and their anti-piracy patrols that they've been doing in the Indian Ocean, those are skills that are transferable to naval operations in the Near Seas. So they're continuously learning and they've demonstrated that over the past five, six years.

COMMISSIONER BARTHOLOMEW: Thank you.

VICE CHAIRMAN SHEA: Thank you.

Commissioner Fiedler.

COMMISSIONER FIEDLER: So I have, I'm going to weave a quick scenario, and you tell me if I'm wrong or way out.

I can conceive of political events inside China that precipitate military action against Taiwan of which, for which they are most prepared. The farther out you go, Japan, the less prepared you are for the

confrontation.

That includes the ability of the Chinese currently to deny access to the United States for sufficient time to like reconsider all kinds of things because the reaction of the United States, when it is denied access, is in and of itself escalatory. In other words, when you're denied access, you have to take greater action in order to counteract that problem.

That is a scenario of which in days the outcome could be determined, in less than a week, i.e., that the terror that is produced on the people of Taiwan is sufficient to say I give up, especially in a political world where the will of the United States and Japan, for that matter, and anybody else, is diminished because this is an internal fight.

In other words, yes, it's democratic people, yes, there's 20 something million of them, but, you know, there's a lot at stake, and that that move by--I mean why did you concentrate 1,100 ballistic missiles, which is, I would think, a military vulnerability, okay, i.e., I can take out a whole lot of people just by--a whole lot of equipment just by accident by saturating that area, but we're not going to do that in a preemptive way so that at some point the apparent leverage is, in fact, exercised.

I myself believe that that is more likely a scenario that than exists in the East China Sea and the South China Sea than any other, and that there is a political imperative greater than any other inside China, and that everybody's talk about the instability, the fragility of the Party's hold on people, that's going to be the reaction, the nationalist reaction, that is so close.

And that the current state of land ballistic missiles--I mean it's nice and fine to talk about Japanese theater threats and anti-missile defense on that score, but this is the one that's facing us in the near term.

Am I weaving a scenario that is out of this world, or am I weaving a scenario that in fact is sitting before our faces that we're not talking about? And I don't want you to answer first.

[Laughter.]

COMMISSIONER FIEDLER: Okay. Because I, because we've had this discussion a little bit. I want the others to answer.

MR. GORMLEY: Because this is obviously speculation, the question is in the nature of speculating about--

COMMISSIONER FIEDLER: Everything we've talked about is speculating except for the hardware.

MR. GORMLEY: No.

VICE CHAIRMAN SHEA: That's speculation too.

COMMISSIONER FIEDLER: I am asking a political question. I'm talking about--we have to plan military scenarios; right?

MR. GORMLEY: Yeah, yeah. I could imagine a scenario in which China confronts earlier than I would anticipate would be the case now, the challenge of coping with making the hard political choices that deal with issues like the demographic situation in China, the long-range demographic impact, which people are talking about 2030, 2030s or so, the economic downturns in the performance of the Chinese economy, the long-term consequences of the one-child policy that reduce the capacity for appropriate labor numbers to deal with changing economy, these coming to roost much earlier, and China having no option but to take care of the Taiwan problem in a so-called "one fell swoop."

COMMISSIONER FIEDLER: That's what I'm--

MR. GORMLEY: And I could imagine circumstances in which leading up to that if the U.S. had not taken sufficient measures to have the appropriate readiness to come to the aid of dealing with a problem like that. So it's conceivable however broadly cast.

DR. YOSHIHARA: I would list three--there may be more--factors that may drive China to action. First is this notion that time is not on China's side. That's already been mentioned. This notion that there are closing windows of opportunity when China can act, that China should act at the peak of its power, and perhaps when its adversaries are not as powerful. So certainly timing is one factor.

The second one would be internal imperatives, whether internal chaos and what not might lead China to act abroad. We do have a historical example from China itself, and that's the Taiwan Strait crisis

of 1958. There's scholarship out there that suggests that it was Mao's domestic agenda that drove Mao to pick a fight over the offshore islands in 1958. So there's certainly that internal dynamic.

But the one that I really worry about most is that China misreads America's will. There's a misperception about the American lack of will in the region/The logic goes like this: China thinks it values Taiwan much more than the United States, and that relatively speaking, the United States does not value Taiwan as much, and therefore the United States will not act.

I hope the Chinese don't draw that conclusion because there are many other factors involved in why the United States would come to the defense of Taiwan. The thing is there are plenty of historical examples of our adversaries misreading us, whether it's Pearl Harbor, the Korean War, or 9/11. All of them were based in part on some perception of the United States not having the will to get involved. Yet we got involved in all three of those conflicts and for protracted periods of time.

So that's my main worry. Our ability to bolster deterrence by signaling to China that we are in it for the long haul is something that we need to do, and that involves strengthening our ability to handle China's missile threat, and to assure our allies in the region, particularly Japan, that will be critical to our staying power.

COMMISSIONER FIEDLER: Go on, Mark.

MR. STOKES: I think that's a very--it's a perceptive question, and my response to that would be to sort of play a little bit more on that political aspect. When you look at dynamics across the Taiwan Strait, particularly in the context of the existing KMT policy, one China, in which there's one China, Taiwan is part of China, and the ROC is the sole legitimate government of that one China, now it's a narrative, but that's sort of the one China, their one China principle. It's been stated many times.

Now if you're sitting in Beijing, bearing in mind that the Chinese Communist Party views cross-Strait issues in the context of legitimacy, and if you view that really in effect what the KMT is saying is that their system of government over one China is a legitimate approach, Beijing tends to view competition in the Taiwan Strait, of course it has elements of economic cooperation, but arguably in terms of a zero sum game in terms of legitimacy, and that's why one country/two systems is at really the core of their policies, is to be able to lock Taiwan, and you have some parts of one country/two systems.

But the key element, of course, is international, is to be able to lock the international community into consenting to one country/two systems in which Beijing has control of all interactions from Taipei in the form of a sort of co-management, for example, agreeing whether or not, what arm sales the United States can provide Taiwan, all interactions, senior level visits.

Because when you look at legitimacy, if we send a senior level official over to Taipei, that to some extent extends some degree of legitimacy to ROC. At a minimum, it sends a clear message that Beijing's definition of one China is not correct.

And so when you look at viewing Taiwan as somewhat of a challenge to CCP legitimacy on monopoly of power, there's going to be a little bit more sensitivity to domestic problems and tracing some of those problems or viewing Taiwan as the whipping boy, or as a source of it, or the United States, and so therefore the scenario that you laid out is something that warrants a lot more consideration, with one caveat, and that's as Americans we tend to think of things in binary terms. It's either war or peace, military, a very military perspective.

Whereas, in my view, in terms of the PLA and the CCP as a broader whole, it's a state of constant warfare, constant warfare, in which there is just different elements, different degrees within that whole state. And a constant--you see the terms, deterrence warfare, of course political warfare. You see all kinds of warfare, what's called the three warfares. It's a constant state.

So there's a very--military force is actually very, very integral to a broader political strategy, and the scenario that you laid out is most certainly something to think carefully about.

COMMISSIONER FIEDLER: Thank you.

VICE CHAIRMAN SHEA: We have about nine minutes' worth of questions, question time left.

COMMISSIONER FIEDLER: Can I have another round, please?

VICE CHAIRMAN SHEA: Okay. Well, I'll ask a quick question. I'll ask two questions, and if you could do it real quickly. One, if someone could tell me any information on extending the range of the

DF-21D so that our aircraft carriers have to be even farther out? If there is any latest information you can share?

And, secondly, I just want to thank you, Dr. Yoshihara, for bringing Japan into this discussion. What, if you could just tell us--you mentioned earlier that the Japanese feel there's a precedent for developing a counterstrike option with respect to North Korea, but what are--my sense is there is tremendous domestic political obstacles for Japan to sort of build up its cruise and ballistic missile inventory, and I just would hope you could just briefly talk about that.

So the first question about the DF-21D, any information about extending the range of that? I've seen reports that they're working on extending the range. Anything, Mark?

MR. STOKES: On the DF-21D, I mean the general conventional wisdom is that the current system, which may be operational available, is about 1,700 kilometers, something like that.

As I mentioned before, there's generally an incremental approach, that once a system enters the operational inventory and initial production, there's generally going to be a follow-on variant that's going to have some improvement, and range is a natural improvement to that. There's been some indication, for example, of extending that basic variant DF-21D to a range that has perhaps 3,000 kilometers, for example, to be able to sort of extend that envelope out and to force, at least force U.S. operations perhaps farther out.

Whether or not it would be called a DF-21E or whether it would be called something different is open to question. I would posit it may be called something different, particularly if we're dealing with a solid motor, which is the critical path, so to speak, in that particular variant. If there is a new motor, for example, that has a wider diameter, it's probably--it's going to have a new designation.

VICE CHAIRMAN SHEA: Okay. Thank you. You could let us know if you see anything in the literature. Thank you.

Dr. Yoshihara.

DR. YOSHIHARA: What I'll do is lay out the pros and cons of Japan's possible adoption of a counterstrike option. Certainly from a pro perspective, China right now is essentially operating in that vacuum that Mark talked about, which is a competition-free environment where China can build one of the largest conventional strike missiles in the world without anybody essentially responding to it.

And so I think the possibility of Japan entering into the fray essentially says to China this is the possible strategic consequence of China's actions.

Now from an operational perspective, a counterstrike option would be designed to punish China for a strike on Japanese territory. I think there is a political dimension to this. Today, Japan is in this kind of a scenario where it would be a free-for-all for China to attack while Japan would give China sanctuary. That might be politically palatable. So Japan should also have the option essentially of potentially hurting China. Japan could do that by threatening to disrupt China's ability to conduct what's a highly structured, choreographed attempt to use their missiles.

So the types of missile campaigns I think would be limited to counterforce targets.

The cons are also fairly substantial. First of all, if you take the missile competition to its logical conclusion, in my view, that's not a game that Japan can win. China will, to put it bluntly, run out of targets before Japan runs out of targets against China. China also has that many more missiles. If you think about this in terms of an escalating missile competition, this is probably not something that Japan can win financially but also in terms of its ability to hurt China enough to coerce or deter China.

These are what I think are the kinds of considerations that Japan would have to consider.

VICE CHAIRMAN SHEA: Okay. Thank you.

Dr. Tobin.

HEARING CO-CHAIR TOBIN: I was going to ask about Japan, too, and you've covered most of it, Dr. Yoshihara, but one question, when you outlined at the end of your testimony the different things that could be done in Japan, how much, if any, of that has been discussed that you know of in Japan and vis-a-vis the U.S. and Japan?

DR. YOSHIHARA: My understanding is that--

HEARING CO-CHAIR TOBIN: Including moving aircraft, et cetera--

DR. YOSHIHARA: Sure.

HEARING CO-CHAIR TOBIN: --to other ports?

DR. YOSHIHARA: All of those options have been publicly discussed and have been raised as options both in terms of passive and active defenses. In the latest National Defense Program Guidelines issued in 2013, it explicitly mentions the potential use of civilian airports and ports, which is a good sign.

The Japanese have also explicitly talked about hardening existing facilities. Japan is also planning to improve the types of interceptors that would be used by their Patriot missiles to better guard against air and cruise missile threats. So there is clear evidence that the Japanese are considering all of those.

And the one option that I'm most interested in following is the potential Japanese deployment of counterforce units on the Ryukyu Islands. The Japanese have already demonstrated the capacity to surge truck-mounted anti-ship cruise missile units onto the islands. In my view that capability not only imposes costs on China in terms of its ability to operate in the East China Sea, but it might force the Chinese to direct their attention to a new theater, which would impose costs in the sense that the types of weaponry they have to devote to that theater would come at the expense of what they can do against Taiwan or someplace else.

HEARING CO-CHAIR TOBIN: Please keep us actively involved with that dialogue in terms of what you're learning.

Thank you.

DR. YOSHIHARA: Thank you.

VICE CHAIRMAN SHEA: Senator Talent.

COMMISSIONER TALENT: We only have a couple minutes. You all have been very patient. One of our later witnesses talked about developing options, the point of which is either that are non-escalatory or that escalate horizontally in the event of a confrontation.

So would you agree that that really ought to be the focus? And one of the things I'm getting, I'm getting more and more concerned about the whole concept of air-sea battle and what it would mean in terms of a very highly vertical escalation. So do you like that concept of horizontal escalation options that don't push the conflict up?

MR. STOKES: I agree that there are some destabilizing aspects and destabilizing trends. I would tend to put the impetus on Beijing's approach to their fundamental insecurities that they have in terms of their missile-centric strategy in terms of putting more attention there.

A horizontal approach, meaning getting more allies and friends in support of the United States, I think that is absolutely critical, especially at the political level. When you talk about Japan in terms of adding that, for example, one of the best things I think that Japan could do is be able to sort of propose arms control initiatives, to be able, for example, in the United Nations, for example, in calling for things like an expanded version of the INF Treaty or perhaps some other missile control regime to be able to, again, question the legitimacy of this approach that has--so getting political allies, I think, and thinking through political solutions, I think, is important.

COMMISSIONER TALENT: I don't know that we really have time. I'll talk to them after the break.

VICE CHAIRMAN SHEA: Okay. Great. You're fine. Okay. Well, we're done. This was a really fascinating panel, and thank you very much for the thought and care you obviously took in preparing your testimony and appreciate your being here today.

We're going to reconvene in ten minutes at 10:55 for our second panel. Thank you.

[Whereupon, a short break was taken.]

**PANEL II INTRODUCTION BY COMMISSIONER KATHERINE C. TOBIN, PH.D.**

HEARING CO-CHAIR TOBIN: Our second panel today will begin. I want to welcome our witnesses. Thank you all for joining us.

Our second panel will examine the capabilities of China's nuclear missile force. We will look closely at several key technologies which China is pursuing that have potential applications for both its nuclear and conventional missile forces. These new developments have important implications for the United States.

Our first witness is Dr. Christopher Twomey, an Associate Professor of National Security Affairs at the U.S. Naval Postgraduate School. He is the lead organizer of the U.S.-China Strategic Dialogue, a track 1.5 diplomatic meeting on strategic nuclear issues that began in 2005.

Dr. Twomey recently returned from a Dialogue meeting in Beijing so we'll likely hear some about that and we look forward to that. His writings on nuclear doctrine and deterrence issues have been published in numerous journals and edited volumes.

Our next witness is Dr. Christopher Yeaw, the Founder and Director of Louisiana Tech Research Institute Center, where you focus on nuclear security issues. Prior to founding the center, Dr. Yeaw served as the Chief Scientist at Air Force Global Strike Command, which is responsible for maintaining all of the United States' nuclear- capable ballistic missiles and bomber forces. You look so young.

Finally, we will hear from Dr. James Acton, Senior Associate and Co-Director of the Nuclear Policy Program at the Carnegie Endowment. Dr. Acton received his doctorate in physics and specializes in deterrence, disarmament, nonproliferation and nuclear energy. He is widely published on these subjects.

So, gentlemen, please keep your oral remarks to about seven minutes in length, and Dr. Twomey, we'll start with you, please.

**OPENING STATEMENT OF CHRISTOPHER TWOMEY, PH.D.  
ASSOCIATE PROFESSOR, U.S. NAVAL POSTGRADUATE SCHOOL**

DR. TWOMEY: Thank you, Chairman Reinsch. Commissioners, I appreciate the opportunity to appear before you and commend the Commission for your attention to this important issue set.

China's strategic capabilities are in the midst of some dynamic change, and I think it's vital for the U.S. to understand both the nature and the sources of those changes but also think about the implications of them, and I'm honored to be part of this panel and today's hearing. I've been working on these issues for some 25 years and, as Commissioner Tobin mentioned, have been working on officially unofficial dialogues with the Chinese on these issues for the last ten.

Rather than go through my entire statement, I'll try to highlight just a couple of the key points that I think are more unappreciated and include some discussion of implications for the U.S.

I want to focus a little bit on the quantitative growth because there has been some. I think it's important to put that in context, make sure we're apples-to-apples comparisons.

Second, I want to emphasize the importance of understanding how China views its strategic position, how the strategic environment looks from Beijing's perspective. And while I think a lot of the challenges and escalatory potential that were alluded to in the first panel and that I'll return to here are driven by decisions taken in Beijing, I think it's important to think about what we can do to mitigate some of these.

Chinese nuclear forces are certainly diversifying, growing, and modernizing. All of that occurs under the context of China viewing its forces solely for deterrent purposes, a retaliatory set of capabilities that are consistent with its longstanding "no first use" policy first articulated in the wake of the Chinese test in 1964 under the guidance of trying to obtain a "lean and effective" deterrent force.

China has been historically subjected to nuclear coercive threats, and an important goal for them is finding ways to get out from underneath that, and there isn't much of a literature in China on the course of utility of nuclear forces used by Beijing against potential adversaries.

With regard to particular systems, China is only starting to deploy the modern survivable ICBMs, the DF-31s and 31As, as the Commission well knows, with something like 20 to 40 launchers available now. A heavier DF-41 system remains under development.

With regard to both of these systems, I think it's important to emphasize these have been slow to mature. There is often a sense that the United States has been surprised by the pace or nature of Chinese weapons' developments in some areas. That's not the case in the nuclear arena. We have seen these systems coming for a long time.

Similarly, on the SSBNs, the ballistic missile launching submarines, the Jin-class are now starting to enter into service. There are three boats in the water. We expect the JL-2 missile will be mated with those submarines soon. We've been again expecting that for several years now so we've seen this system coming as well.

That will certainly, when it happens, raise some important questions about the nature of Chinese forces in terms of their ability to command and control those forces and some issues about survivability.

Across all of these areas, it's pretty clear that we're seeing some quantitative increases. If you look back ten years ago, the U.S. was probably facing a few dozen deliverable warheads from China. Today that number is probably 60 or more, and as the DF-31 system continues to come into the force, as the JL-2 system appears in an operational capacity, it's likely that ten years from now we'll be heading well above a hundred.

If the land-based force is MIRVed, you might see somewhat more than that. So I think it's reasonable to expect in another ten years a Chinese force of perhaps 200 to 300 deliverable warheads against the United States might be available. That's an order of magnitude increase from ten years prior so (thus over a 20-year period). And I don't mean to belittle that, but at the same time I think one often hears concerns about a sprint to parity, and I think that is somewhat overstated.

Today the United States has over just under 5,000 warheads. Under "New START" counting rules, the particular way that warheads are counted under that arms control treaty, we have approximately



1,500 in an operational status. However, by those same counting rules, if you applied them to China, China would have zero warheads today under operational readiness.

So an apples-to-apples comparison is either a few hundred warheads for China and several thousand for the United States or 1,500 for the United States and zero for China, and I don't think those sorts of ratios are likely to change dramatically in the next decade.

With regard to China's perceptions of its strategic environment, it's important to remember that China generally thinks of it responding to a nuclear attack so that its forces would have already been attrited by U.S. conventional and potentially nuclear attack. In less discussed contingencies, you might say the same with regard to a Russian attack on Chinese systems. And this reduced force then has to retaliate against the United States and the set of missile defense assets that the U.S. brings to the table.

The Chinese aren't just concerned about national missile defense systems. They're not just concerned about the 44 ground-based interceptors that are based in Alaska and Vandenberg, California. They're also quite concerned about sea-based systems. The SM-3 block II series missiles may have some capability against Chinese arsenal. More importantly, the integrated set of sensors that comes with theater-based--what the United States would think of as theater-based, or regional missile defense, might also play a role in enhancing the U.S. capabilities, perhaps giving "shoot-look-shoot" opportunities.

Many of these sensors are forward deployed in the region on the territory of our allies or partners. Even more broadly than that, the Chinese are also concerned that this missile defense system begins to serve as the kernel for an anti-Chinese alliance that is integrating United States, Japan, potentially South Korea with the THAAD system. Taiwan has a very large radar that we sold to them a number of years ago. Potentially also Southeast Asia is thrown into the mix.

And so when China sees something like a NATO in Asia arising, that heightens their security concerns.

One could add to this other elements of Chinese concerns with regard to conventional prompt global strike systems or other standoff systems that might be used to, without U.S. crossing the nuclear threshold, attrit the Chinese forces.

At the same time, the U.S. is engaged in what the Chinese regard as a large-scale modernization of our own nuclear program. It's often stated in the United States in this city that the U.S. is the only nuclear arms state not modernizing its forces. That assertion is met with derision in Beijing when they look at systems like the B61 air-launched cruise missiles that would potentially have a nuclear role, the modernization of the Ohio-class SSBNs, and the development of a new strategic bomber, all in the cards in the next decade or so.

So those are important elements of the U.S. threat as the Chinese see it.

I think there's again much that can be done to address the dangers I've highlighted that centers on the Chinese side, and when I'm in Beijing talking to our interlocutors there, we certainly make those points, but here in Washington, let me highlight a couple of things that I think we can also do on our side.

The National Defense Authorization Act of 2000 puts in place a number of restrictions on the ability of the United States to talk to the Chinese in the nuclear area in particular. While it is absolutely the case that we need to protect national security secrets without compromise, I think in particular the lab-to-lab channel with Beijing would be useful to push and to reopen. That's a useful way for us to engage an important interlocutor on their side in terms of shaping their nuclear policy just in the same way that our labs have shaped our nuclear policy going back decades.

Second, I would encourage moderation on the deployment of advanced missile defense capabilities. I think that is a losing race for the United States both financially and operationally, and I think we had some discussion of that in the first panel this morning. That would be met with a continued Chinese buildup.

While there may be a role for limited missile defense capabilities with regard to North Korea and Iran, engaging in something that might exacerbate Chinese misperceptions goes against stated policy, and I think this is important. Stated policy that goes back for decades now by the United States, and we need to ensure that our actions on missile defense match with that stated policy.

I'll stop there.

**PREPARED STATEMENT OF CHRISTOPHER TWOMEY, PH.D.  
ASSOCIATE PROFESSOR, U.S. NAVAL POSTGRADUATE SCHOOL**

April 1, 2015

China's Offensive Missile Forces

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“Testimony before the U.S.-China Economic  
and Security Review Commission”

Following a period of only slow growth, Chinese nuclear posture modernization and buildup has been an important development over the past decade. Key deployments in both land and sea based forces provide Beijing with new capabilities. Although Beijing's declaratory policy has remained constant, there are some signs of more subtle shifts in the way China may be thinking about its force. It is important to understand the drivers—both internal and external—for this modernization, the implications for strategic stability in the Sino-American relationship, and the new challenges this poses for U.S. extended deterrence commitments in the region.

China's nuclear arsenal has generally grown rather slowly relative to other powers facing major security challenges. That said, the nature of recent developments have a certain dynamism to them that warrants the commission's attention. Core to these recent changes are a modest quantitative buildup and a significant enhancement of survivability and other qualitative improvements. In order to consider the near term trajectory of Chinese strategic modernization, it is first necessary to understand the rationale for such strategic systems in China's security policy.

The study of Chinese nuclear capabilities is mired in opacity. While all nations preserve some secrecy regarding such weapons, China is the most secretive among the P-5, and indeed is more secretive than some of four states possessing nuclear weapons beyond the NPT's P-5. This raises particular challenges in evaluating both contemporary and future Chinese nuclear weapons' programs and strategies. There are, however, a burgeoning range of Chinese language sources (some of which have been translated in their entirety) from authoritative military institutions in China that provide valuable materials. Some of these sources are “classified” within the Chinese system, but are nevertheless available at university libraries outside of China. The official Chinese Defense White Papers have also gradually included more discussion on such topics. Unclassified assessments are also frequently, if not routinely, included in the Pentagon's annual report “Military and Security Developments Involving the People's Republic of China,” and reports or congressional testimony from NASIC or similar agencies. Finally, this author has helped to manage an unofficial set of meetings between academics, think tank analysts, government officials, and military officers (the latter two categories, attending in their personal capacity) from the two countries over the past decade. Generally meeting twice a year, these sessions provide additional context and nuance to the understanding from the written materials.

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<sup>63</sup> The views presented are those of the author and do not necessarily represent the views of the Naval Postgraduate School, the Department of the Navy, or the Department of Defense.

## Capabilities, Today and in the Near Future

China generally describes its force posture planning as requiring a “lean and effective” force aimed to deter nuclear attack against itself and restrained by a rigid “no first use” policy. Chinese participants at track 1.5 dialogues (that is, those “unofficial” meetings with officials in the room) have described “lean and effective” as the primary analytic tool that guides China’s nuclear force building. The term was seen to capture not just quantitative warhead arsenal decisions, but also training, doctrine, command and control, and logistics support. The “lean” side of the term refers to the size of the nuclear force, while “effective” refers to safety, reliability, penetrability, and the qualitative effectiveness of weapons. The Chinese side in such meetings makes it clear that the particular variables used to determine the “lean” side of the equation should remain ambiguous, while making it clear that China possesses a nuclear force capable of retaliation. The “effectiveness” side of the equation is not intended to be ambiguous in the least. While there were few specifics, it was clear that “lean” is quite lean indeed. A few times Chinese military officers would refer to the ability to hit a “handful” or a “few” cities as being sufficient for this criterion.

This conception seems borne out by outside information. According to unofficial estimates, China has approximately 250 nuclear warheads.<sup>64</sup> Only a small portion of them can reach the United States. All are relevant for regional deterrence missions.

China is only just starting to deploy modern ICBMs. As an emerging missile capability, in 2006, China began deploying the road mobile, solid fueled DF-31 and (the next year) -31A.<sup>65</sup> China has approximately 20-40 DF-31 series launchers.<sup>66</sup> There is likely to be a continuation of the production of the DF-31A and its deployment to the Second Artillery. Such systems are not viewed by Beijing as sufficient, however. The next system, the DF-41 continues to undergo development. This heavier system will give China a road mobile (thus very survivable), solid fueled system that may have the throw weight to deploy MIRVs.<sup>67</sup> When such a system comes online, China will have the opportunity to significantly increase the size of its arsenal, if it so chooses.

China has long possessed a few dozen DF-5 or DF-5As.<sup>68</sup> (For both these land based systems, the DF-5 and DF-31, the “A” variant has sufficient range to target the entire United States, while the earlier variant can only target portions of the northwestern part of the continental United States and Alaska and Hawaii.<sup>69</sup>) These liquid fueled, silo based systems date from the early 1980s. Although such silos could be hardened and decoy silos built, these weapons would be highly vulnerable to attack by advanced conventional munitions or nuclear preemption. China is nevertheless “enhancing” these existing liquid

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<sup>64</sup> Hans M. Kristensen and Robert S. Norris, “Chinese Nuclear Forces, 2013,” *Bulletin of the Atomic Scientists*, November 1, 2013, <http://bos.sagepub.com/content/69/6/79.full.pdf+html>.

<sup>65</sup> Office of the Secretary of Defense, “*Military and Security Developments Involving the People's Republic of China: Annual Report to Congress*,” (Washington, DC: Department of Defense, April, 2009), p. 24. Unless otherwise noted, all data regarding the contemporary Chinese arsenal comes from this series of annual DOD reports.

<sup>66</sup> National Air and Space Intelligence Center, *Ballistic and Cruise Missile Threat*, NASIC-1031-0985-13, Wright-Patterson AFB, Ohio, 2013, p. 21. Robert D. Walpole, ‘Statement for the Record to the Senate Subcommittee on International Security, Proliferation, and Federal Services on the Ballistic Missile Threat to the United States’, 9 Feb. 2000, [www.cia.gov/news-information/speechestestimony/2000/nio\\_speech\\_020900.html4](http://www.cia.gov/news-information/speechestestimony/2000/nio_speech_020900.html4).

<sup>67</sup> Office of the Secretary of Defense, “*Military and Security Developments Involving the People's Republic of China: Annual Report to Congress*,” (Washington, DC: Department of Defense, April, 2014), p. 7.

<sup>68</sup> National Air and Space Intelligence Center, *Ballistic and Cruise Missile Threat*, NASIC-1031-0985-09, April 2009, p. 21.

<sup>69</sup> “*Military and Security Developments Involving the People's Republic of China*,” (2014), p. 86

fueled missiles (DF-5A).<sup>70</sup> This belies the expectations that such missiles (vulnerable to first strike attack because of their long fueling time) might be retired as more modern missiles with similar range came online (DF-31A).

China is beginning to deploy more advanced warhead delivery systems as well: “China’s new generation of mobile missiles, ... [have] payloads consisting of Multiple Independently Targeted Reentry Vehicles (MIRVs) and penetration aids.”<sup>71</sup> The MIRVed systems and “penetration aids” will enhance their ability to survive US missile defense systems. (The MIRV “bus” that carries the different warheads and manages their separation is a similar technology and engineering issue to deploying decoys and obscurants.) Similarly, the Chinese deployment of the anti-ship ballistic missile (DF-21D) suggests Chinese efforts in the area of maneuvering warheads are quite advanced. These will have utility against missile defense systems as well. Continued effort at ensuring penetrability is likely to be a key goal for China over the next decade.

A separate development is diversifying China’s nuclear strategic force away from sole reliance on land based systems. The nascent deployment of Jin-class SSBNs is creating major change in China’s nuclear force. (China’s previous SSBN, the Xia-class, conducted, at most, a single operational patrol.) While its JL-2 missile remains not yet operational, it has undergone testing in the past few years.<sup>72</sup> It seems likely that it will be deployed in the handful of Jin class boats in the next few years. (That said, the annual report has repeatedly been overly optimistic regarding when a first deterrent patrol for those boats will occur.) China has, in contrast to its usual opacity, engaged in some public signaling of this nascent capability.<sup>73</sup>

Furthermore, the Second Artillery is increasing the quality of its training and preparation, including such improvements as:

- fighting under conditions of “informationalization” (i.e., recognizing U.S. advances in intelligence, surveillance, and reconnaissance (ISR), and command and control;
- complex electromagnetic environments (recognizing the dangers of jamming and compromised communications systems); and
- using an opposition “blue force” in training (rather than a scripted opponent).<sup>74</sup>

Between these developments, it is already clear that some quantitative buildup will, and already has, occur(ed). A mere decade ago, China faced the US with only a few dozen nuclear warheads. Today, that number is at least 50.<sup>75</sup> Given the continued development of delivery systems, and the limited instances

<sup>70</sup> “Military and Security Developments Involving the People’s Republic of China,” (2014), p. 7.

<sup>71</sup> “Military and Security Developments Involving the People’s Republic of China” (2014), p. 28.

<sup>72</sup> See Bill Gertz, “PLA Navy to Begin First Strategic Missile Submarine Patrols Next Year,” *Washington Free Beacon*, July 23, 2013, available at <http://freebeacon.com/pla-navy-to-begin-first-strategic-missile-submarine-patrols-next-year/>

<sup>73</sup> Xu Shuangxi and Qian Xiaohu: “Forging the Underwater Shield of the Republic -- Officers and Troops of a Certain Navy Submarine Base Set Tens of Records During More Than 40 Years of Piloting ‘Blue Whales’ Across the Length and Breadth of the Vast Ocean,” *Jiefangjun Bao [PLA Daily]*, October 28, 2013 (OSC Record: CHL2013102831056207); Qian Xiaohu, Wei Bing, and others, “Heroic Nuclear Submarines, Sharpening Swords in Depth of Vast Oceans,” *Jiefangjun Bao [PLA Daily]*, October 29, 2013 (OSC Record: CHL2013102930668783).

<sup>74</sup> Christopher P. Twomey, “The People’s Liberation Army’s Selective Learning: Lessons of the Iran-Iraq ‘War of the Cities’ Missile Duels and Uses of Missiles in Other Conflicts,” in Andrew Scobell, David Lai, and Roy Kamphausen, eds., *Chinese Lessons From Other Peoples’ Wars* (Carlisle, Penn: Strategic Studies Institute Book, 2011) and Michael S. Chase, Andrew S. Erickson, and Christopher Yeaw, “Chinese Theater and Strategic Missile Force Modernization and Its Implications for the United States,” *Journal of Strategic Studies* 32 (2009), pp. 67–114.

<sup>75</sup> Lt. Gen. Ronald Burgess, Director, Defense Intelligence Agency, Statement before the Senate Armed Services Committee, 112th Cong., 2nd sess., Feb 16, 2012, p. 19, <[www.dia.mil/public-affairs/testimonies/2012-02-16.html](http://www.dia.mil/public-affairs/testimonies/2012-02-16.html)>.

of replacing old systems like the DF-5A, this quantitative increase will continue, heading well above 100 for the following reasons. It is likely that the submarine force will boast five or six boats, each with 12 missile tubes.<sup>76</sup> (Of these 60 or 72 missiles, only a subset would be available to put to sea on short notice.) A MIRVed land based force would provide much greater potential for increasing the Chinese arsenal size. While many hundred would seem less likely, another 100 increase in the land-based arsenal seems plausible over a decade. Thus, a Chinese force of as many as 300 might be available (in contrast, the United States today has just under 5000 warheads<sup>77</sup>) in that timeframe. (Under “New Start” counting rules, the United States is limited to some 1500 of those to be operationally deployed. However, by those same counting rules, today, China has zero operational warheads.)

## Rationale/Drivers

If one considers the utility for military force through the lenses that Robert Art suggests—defeat, deter, compel, and swagger—China generally seems to focus only on deterrence.<sup>78</sup> Based on the preponderance of available evidence, there is not a well developed view in Beijing of the coercive utility of China's arsenal. Nuclear weapons do not “defend” in the traditional sense. China's “no first use” declaratory policy makes it challenging to “swagger” with any effectiveness. However, after a history in the early Cold War of being subjected to numerous nuclear coercive threats, China has an acute desire to avoid being vulnerable to such again.<sup>79</sup> Their deterrent posture to achieve this has typically required only a modest arsenal size with relatively relaxed postures (at least when compared to the U.S. and Soviet precedents).

Serving the strategic goal of presenting China with some form of assured retaliation against the United States is likely to continue to be the dominant goal of Chinese strategic policy.<sup>80</sup> This is seen to be a task requiring some modernization and further expansion of the force, but it is not seen as an urgent priority. China has maintained a relaxed pace of development of its nuclear force over the past 50 years, and this is likely to continue.<sup>81</sup> Nevertheless, Chinese leaders see themselves in a dynamic strategic environment that requires them, alone among the established nuclear powers under the Non Proliferation Treaty, to modernize and increase its forces.

The key drivers for such dynamism for China is U.S. modernization of missile defenses; other factors such as advanced conventional forces and lingering concerns regarding the modernization of US nuclear forces also play a role. China views U.S. missile defense systems as a potential shield rendering their limited arsenal impotent.<sup>82</sup> It is important to remember that Chinese leaders generally think of their force

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<sup>76</sup> Office of Naval Intelligence, *The People's Liberation Army Navy – A Modern Navy with Chinese Characteristics*, Suitland, MD: Office of Naval Intelligence, 2009. That said, this may be a mid range estimate. The United Kingdom has been satisfied with 4 boats.

<sup>77</sup> Department of Defense, “Fact Sheet: Transparency in the U.S. Nuclear Weapons Stockpile,” April 29, 2014, [http://www.defense.gov/npr/docs/10-05-03\\_Fact\\_Sheet\\_US\\_Nuclear\\_Transparency\\_FINAL\\_w\\_Date.pdf](http://www.defense.gov/npr/docs/10-05-03_Fact_Sheet_US_Nuclear_Transparency_FINAL_w_Date.pdf)

<sup>78</sup> Art, Robert J. “To What Ends Military Power?” *International Security* 4, 4 (1980): 3-35.

<sup>79</sup> On that history, see Gordon G. H. Chang, “To the Nuclear Brink: Eisenhower, Dulles, and the Quemoy-Matsu Crisis,” *International Security* 12 (April 1988), pp. 96–123; Rosemary R. J. Foot, “Nuclear Coercion and the Ending of the Korean Conflict,” *International Security* 13 (1988), pp. 92–112.

<sup>80</sup> Fravel, MT and Medeiros, ES, “China's Search for Assured Retaliation: The Evolution of Chinese Nuclear Strategy and Force Structure,” *International Security* 35:2, 48-87 (2010)

<sup>81</sup> We have recently passed the 50 year anniversary of China's first nuclear test, on October 16, 1964.

<sup>82</sup> The text here condenses a longer treatment of these issues that can be found in Christopher Twomey and Michael Chase, “Chinese Attitudes Toward Missile Defense Technology and Capabilities,” in *Missile Defense: The Fourth Wave and Beyond*, and Catherine M. Kelleher and Peter J. Dombrowski, eds. (Stanford, Calif.: Stanford University Press, 2015).

used only in response to an attack by an adversary. In such a scenario, an already attrited Chinese force that might be used to retaliate then would face a mix of land-based interceptors (the GBI system, based in Alaska) and sea-based (advanced variants of SM-3 interceptors based on Aegis warships). This puts some demands on their force sizing.

Most broadly, there is a sense in Beijing that U.S. missile defense undermines a relatively stabilizing phenomenon of mutual vulnerability between the U.S. and China. A former deputy commander from the SAF outlined these concerns.<sup>83</sup> Other Chinese attack missile defense as a way to escape mutual vulnerability on the grounds that it is an attempt to achieve “absolute security” for the United States. By implication, this means absolute insecurity for others, China included.<sup>84</sup>

Beyond the national missile defense system, however, Chinese often express concerns about the future of sea-based missile defense. In particular, future variants of the Aegis system’s SM-3 block IIa and the recently cancelled block IIb are viewed as threatening to China. Were those systems deployed either near Chinese shores or close to the United States, given their assessment of the high burnout speed of their missiles, Chinese analysts from the technical community conclude that they would have some capability against Chinese offensive nuclear forces. Thus, the potential for the future is not only for a depleted Chinese offensive force to have to face 44 (or more) GBI systems, but perhaps hundreds more SM-3 block II rounds.<sup>85</sup>

More broadly, and to some extent also forward looking, are Chinese threat perceptions generated from the deeply integrated system of sensors, satellites, command and control systems, and interceptors that are required for missile defense to be effective. From a purely technical perspective, the steady expansion of U.S. deployed missile defense radars in Asia has garnered much concern.<sup>86</sup> The second X-band radar in Japan increases the scope of coverage toward Chinese launch points.<sup>87</sup> Many Chinese raise concerns about the PAVE PAWS phased array radar that the U.S. sold to Taiwan. Given the extended range that the PAVE PAWS system has, Chinese worry that its only rational explanation is as an integrated component of a region-wide U.S. sensor network.<sup>88</sup> Similarly, this same concern underlies Chinese opposition to a U.S. deployment of THAAD in South Korea. There is also an awareness that space-based cuing can be usefully integrated to enhance the effectiveness of this system.<sup>89</sup>

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<sup>83</sup> 赵锡君 [Lt Gen Zhao Xijun], 慑战：导弹威慑纵横谈 [*Coercive Warfare: A Comprehensive Discussion on Missile Deterrence*] (Beijing: NDU Press, 2003).

<sup>84</sup> Kang Yongsheng, “The US Military’s Strategic Consideration Behind the Building of the Asia-Pacific Missile Defense System,” *Beijing Qingnian Bao* [China Youth Daily], June 28, 2013 (OSC Report: CPP20130628787003). 赵锡君 [Lt Gen Zhao Xijun], 慑战：导弹威慑纵横谈 [*Deterrence and Warfare: A Comprehensive Discussion on Missile Deterrence*] (Beijing: NDU Press, 2003), 91.

<sup>85</sup> This concern has been raised a series of track 1.5 meetings in Beijing and HI that the authors have been involved in. More recently, they are aired in Riqiang Wu, “China’s Anxiety About US Missile Defence: A Solution,” *Survival* 55, no. 5 (October, 2013): 29-52. (Note the author of that piece worked in the nuclear weapons systems laboratory community in China prior to moving into academia.) U.S. technical analysis does not completely rebut those points although it questions some of the key assumptions in them.

<sup>86</sup> Lu Zhengtao and Zeng Shuai: “What is the Purpose of United States Strengthening Anti-Missile Deployment in Asia-Pacific,” *Zhongguo Qingnian Bao* [China Youth Daily], September 14, 2012 (OSC Report: CPP20120914787015).

<sup>87</sup> Wu, “China’s Anxiety About US Missile Defence” (2013).

<sup>88</sup> *Ibid.*

<sup>89</sup> 李景涛, 贺正洪, 周晓光《天基信息支援下的反导BM/C~3I系统建模与仿真研究》现代防御技术 2010年04期 [Li Jingtao, He Zheng-hong, Zhou Xiao-guang, “Study on Modeling and Simulations of BM/C~3I System in Anti-TBM Combat Based on Spaceborne Information Supporting,” *Modern Defense Technology*, No. 4 (2010)] (Available at <http://www.cnki.com.cn/Article/CJFDTOTAL-XDFJ201004019.htm>). T

These concerns work together to create substantial opportunities for “shoot-look-shoot” doctrines for the United States, as Chinese analysts see it.<sup>90</sup> Increasing the likelihood of a successful intercept and reducing the cost associated with alternate firing doctrines, such as shooting two interceptors at a time at each target. Third, depending on the nature of the sensors, there may be advantages in having integrated forward based sensors into the system.

A final set of Chinese concerns, alluded to above, center on the way missile defense cooperation with regional partners tightens and expands U.S. alliances in the region in what appears to many Chinese to be a network of institutions containing China. For instance, outspoken PLA Air Force colonel Xu Dai, aired this view: “China is in a crescent-shaped ring of encirclement. The ring begins in Japan, stretches through nations in the South China Sea to India, and ends in Afghanistan. Washington's deployment of anti-missile systems around China's periphery forms a crescent-shaped encirclement.”<sup>91</sup> These concerns are aired widely.<sup>92</sup> Most emphasize the recent moves to deepen cooperation with Japan. Others raise the prospect of Philippines also being included in the sensor network in the future.<sup>93</sup>

Additionally, Chinese military officials express concerns regarding advanced conventional munitions, such as the conventional prompt global strike systems under consideration in the Pentagon.<sup>94</sup> Such systems might be used to attack China's nuclear arsenal without the US crossing the nuclear threshold complicating (in some sense, anyhow) Beijing's retaliatory calculus.

Finally, the life extension programs for U.S. nuclear warhead and developments of new delivery systems in the next decade or so are also watched with much trepidation in Beijing. The oft heard phrase in U.S. strategic circles that “the United States is the only nuclear armed state not modernizing its forces” is met with derision in Beijing. To Chinese strategic analysts, U.S. programs to modernize the B61 (making it more accurate), spending more than \$10b over the next five years on Ohio-class SSBN replacements,<sup>95</sup> ALCM modernization,<sup>96</sup> development of a new strategic bomber, etc., all look like modernization of the U.S. nuclear arsenal.

Beijing has responded to these changes, and will likely continue to do so over the next decade, through qualitative enhancements to its arsenal, diversification of delivery mechanisms, and a modest (at least) quantitative buildup as described above.

### Emerging Regional Drivers

While China avers that its nuclear force is aimed to deter U.S. coercion or aggression, there are also the early signs of concerns about both reducing the U.S. freedom of action in regional contexts and concerns

<sup>90</sup> Wu, “China’s Anxiety About US Missile Defence” (2013).

<sup>91</sup> Qin Jize and Li Xiaokun, “China Circled by Chain of US Anti-Missile Systems,” *China Daily*, February 22, 2010.

<sup>92</sup> Zhang Lu, “Is the US Return to Asia-Pacific Aimed at Containing China?” *Zhongguo Qingnian Bao [China Youth Daily]*, September 14, 2012 (OSC Report: CPP20120720787008). Zhong Sheng: “Do Not Do Things that will Damage Security Environment of Asia (International Forum),” *Renmin Ribao [People’s Daily]*, October 29, 2012, p. 3 (OSC Report: CPP20121029787003). Kang, “The US Military’s Strategic Consideration,” 2013.

<sup>93</sup> Lu and Zeng, “What is the Purpose of United States Strengthening,” 2012.

<sup>94</sup> My co-panelists book was read with much interest in Beijing. James Acton, *Silver Bullet? Asking the Right Questions About Conventional Prompt Global Strike*, Carnegie, September 2013.

<sup>95</sup> <http://news.usni.org/2015/02/03/%ef%bb%bfnavy-budgeting-10-billion-ohio-replacement-program-next-five-years>

<sup>96</sup> The underlying warhead is being modified (to a W80-4 configuration) and the LRSO program will provide increased survivability for US standoff nuclear cruise missile. [http://fas.org/blogs/security/2014/10/w80-1\\_lrso/](http://fas.org/blogs/security/2014/10/w80-1_lrso/)



about potential Russian threats. Both have led to a significant amount of attention on the modernization of theater systems. Older systems, like the DF-11 and -15, are upgrading their accuracy. Newer systems (like the DF-16) are also coming online. While most of these systems remain conventionally armed, it is unlikely that all do. Similarly, while there has been an apparent freeze in the conventional missile buildup that faces Taiwan,<sup>97</sup> other medium range systems continue to be built. Indeed, according to one U.S. official, deployments in the tactical or regional missile field is the most active part of Chinese modernization efforts today.<sup>98</sup>

These suggest an increased focus on both Russia and to some extent India (as it finally approaches readiness of its long range Agni-V missile systems). The same systems also hold U.S. conventional forces in the region at greater risk: As an integral part of an anti-access/area denial capability,<sup>99</sup> these pose serious challenges for US strategists. These systems are likely to continue to increase in accuracy, penetrability, and quantity. While it seems unlikely that the pace of such buildup will approach that of the short range system buildup against Taiwan in the 1990s, the more modern and accurate systems will challenge U.S. deployments in the region, and raise questions about the reliability of U.S. extended deterrence commitments.

The implications are significant. China is increasing its conventional capabilities that might have some “strategic effect” and creating increasingly robust nuclear capabilities to deter any U.S. escalation. In particular, the likely effect of this is to raise the costs to the United States of deterring or defeating any Chinese conventional engagement in the region (such as the Senkakus). While assessing the likely outcome of any such conventional fight is beyond the scope of this testimony, suffice it to say that some conventional battles would be challenging for the United States. Given the increased robustness of China’s nuclear arsenal, the United States would have to engage in great caution in its offensive components of its conventional strategy against Chinese forces.<sup>100</sup> These are likely to raise the costs to the United States of such a conflict and delay eventual victory.

### **Shifting Doctrine and Related Operating Concepts**

There is significant evidence that the Chinese, and the Second Artillery Force in particular, take the “no first use” policy very seriously. This puts a great premium on ensuring the survivability of its nuclear force in the face of a (hypothetical) large nuclear attack or even one conducted with conventional precision-guided munitions. One manifestation of this is the emphasis on new mobile weapons, at sea and on land, as discussed. Another is the concealment program that has led to a large scale tunneling effort by the Chinese military.<sup>101</sup> (That said, extrapolations of such a tunneling effort to infer huge arsenal sizes have been rather thoroughly rebutted.<sup>102</sup>) Mobile targets are hard to find, and buried targets are hard to

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<sup>97</sup> See comparisons as published in the DOD annual reports.

<sup>98</sup> Lt. Gen. Ronald Burgess, Director, Defense Intelligence Agency, Statement before the Senate Armed Services Committee, 112th Cong., 2nd sess., Feb 16, 2012, p. 19, <[www.dia.mil/public-affairs/testimonies/2012-02-16.html](http://www.dia.mil/public-affairs/testimonies/2012-02-16.html)>

<sup>99</sup> For a discussion on the difficulties of characterizing Chinese maritime strategy, see M. Taylor Fravel and Christopher P. Twomey, “Projecting Strategy: The Myth of Chinese Counter-intervention,” *The Washington Quarterly* (January 2015). [https://twq.elliott.gwu.edu/sites/twq.elliott.gwu.edu/files/downloads/Fravel\\_Twomey.pdf](https://twq.elliott.gwu.edu/sites/twq.elliott.gwu.edu/files/downloads/Fravel_Twomey.pdf)

<sup>100</sup> For further discussion of these issues, see Christensen, Thomas J. “The Meaning of the Nuclear Evolution: China’s Strategic Modernization and US-China Security Relations,” *Journal of Strategic Studies* 35, no. 4 (2012): 447–87. doi:10.1080/01402390.2012.714710.

<sup>101</sup> Hui Zhang, “The Defensive Nature of China’s ‘Underground Great Wall,’” *Bulletin of the Atomic Scientists*, Jan 2012.

<sup>102</sup> Lt. Gen. Ronald Burgess, Director, Defense Intelligence Agency, Statement before the Senate Armed Services Committee, 112th Cong., 2nd sess., Feb 16, 2012, p. 19, <[www.dia.mil/public-affairs/testimonies/2012-02-16.html](http://www.dia.mil/public-affairs/testimonies/2012-02-16.html)> For more information on the debunking of such estimates, see James Acton, “The Underground Great Wall: An Alternative Explanation,” *Proliferation Analysis*, Carnegie Endowment for International Peace, October 26, 2011,



destroy. Another is an emphasis on training to “fight in conditions of a complex electromagnetic environment.”<sup>103</sup> This refers to a range of potential opposing force attacks: cyber attacks on command and control, electronic jamming, or even the electromagnetic pulses that would be generated as a result of nuclear detonations on Chinese soil.

That said, it is also rather clear that there have been “debates” in China about what circumstances might warrant shifting the no first use policy. Key challenges highlighted in this regard are typically centered on offensive conventional forces that might threaten China’s nuclear forces as well as shifting nuclear balances within Asia between China and some of its nuclear powers. That said, these debates do not seem to be particularly active today (in comparison to five years ago). This could change, but at this point, there is a strong emphasis at the highest level of strategy in adhering to no first use.

There are, additionally, discussions raising questions outside this NFU framework that raise questions for many analysts. First, there is some language in a few Chinese documents, such as the *Science of Second Artillery Campaigns*, regarding manipulating threat levels as a way that sounds remarkably similar to nuclear coercion. This raises questions about what might actually define “use”.

Second, in recent documents such as both Defense White Papers and the recent revision of the Academy of Military Science’s *Science of Military Strategy* (2013) there is relatively clear language suggesting China plans to have a “launch under attack” posture. Again, this suggests the issue of “use” might be somewhat broad in meaning. It also has grave implications for crisis stability given limited Chinese early warning, and potential C2 limitations.

Finally, there is some evidence in the new *Science of Military Strategy* as well as in the above mentioned track 1.5 dialogues that China is now considering trans-war nuclear deterrence. There is some new discussion of reestablishing nuclear deterrence in a war *after* a first nuclear use by China’s potential adversary. Thus, China is going to need to consider not only the arsenal requirements for what two stages of nuclear exchanges requires, but also develop additional C2, ISR, and battle damage assessment capabilities.

Separate from NFU and related potential doctrinal shifts, the issue of SSBN deployments and its implications for strategic stability merits consideration. This certainly has implications for strategic balance as traditionally described. Chinese analysts highlight potential advantages for stability such as ensuring a high degree of survivability and reducing vulnerability of Chinese forces to U.S. missile defense forces (that are oriented for launching from specific locations). However, there are also discussions highlighting the challenges China will have both for command and control and for quieting.<sup>104</sup> This development will pose great challenges to China’s military leadership. Its land based force has been able to ensure secure command and control over its nuclear forces by separating the warhead from the missiles in peacetime. This creates an added layer of protection against inadvertent or mistaken launch.

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<<http://carnegieendowment.org/2011/10/26/underground-great-wall-alternative-explanation>>, and Gregory Kulacki, “The Sources of Karber’s Sources,” *All Things Nuclear Blog*, Union of Concerned Scientists, December 7, 2011, <<http://allthingsnuclear.org/the-sources-of-karbers-sources/>>. Addressing this case and the broader dangers of such pseudo-intelligence work, see Joshua Rovner, “Intelligence in the Twitter Age,” *International Journal of Intelligence and CounterIntelligence* 26 (February, 2013), pp. 260–71.

<sup>103</sup> Michael S. Chase et al., “Chinese Theater and Strategic Missile Force Modernization and Its Implications for the United States,” *Journal of Strategic Studies* 32, no. 1 (2009): 67–114; Christopher P. Twomey, “The People’s Liberation Army’s Selective Learning: Lessons of the Iran-Iraq ‘War of the Cities’ Missile Duels and Uses of Missiles in Other Conflicts,” in *Chinese Lessons From Other Peoples’ Wars*, ed. Andrew Scobell, David Lai and Roy Kamphausen (Carlisle, Penn: Strategic Studies Institute Book, 2011).

<sup>104</sup> Wu Riqiang, “Survivability of China’s Sea-Based Nuclear Forces,” *Science & Global Security* 19, no. 2 (May, 2011): 91–120

The sea-based force will not have this luxury. The PLA-Navy will have to find a way to manage this challenge prior to operational deployments of the force. It seems likely that this will delay this deployment, somewhat.

### **Reducing these Dangers**

What steps can be taken to avoid a degenerating spiral, blurring of conventional and nuclear warfare, arms racing, and related problems? Much relies on China recognizing the horrific dangers posed by a nuclearized conflict (which only happened for the United States in the wake of the Cuban Missile Crisis), having greater degree of civilian oversight of nuclear programs (again a challenge for the United States throughout the CW), and shouldering the responsibilities as befits its increased stature in the global international system. But much can be done by the US, and by congress in particular.

The National Defense Authorization Act for FY2000 (NDAA2000) puts restrictions on the ability of elements of the U.S. government to engage with China on these strategic matters. While the need to protect American national security secrets must of course not be compromised, this greatly complicates Washington's ability to have a constructive dialogue with Beijing. In particular, the closing of the lab to lab channel no longer serves American interests, if it ever did. The laboratory community in China is an important contributor to national debates on nuclear policy, perhaps the dominant voice. We need to ensure its members understand our stated policy, and find ways to engage them to avoid worst case arms racing.

Aggressive development missile defense capabilities that might threaten to undermine Chinese retaliatory capabilities will only lead to further qualitative and quantitative buildups. This is a losing race for the United States, both financially and operationally. While there may be a role for limited capabilities in North Korean and potentially Iranian contexts, stated U.S. policy for decades has been that our missile defense program is not aimed at China. We need to ensure our actions on missile defense align with our words. Chinese perceptions of mismatches here are large, and they matter. Again, congress has a role in creating these perceptions.

Finally, it is important to avoid exacerbating Chinese threat perceptions regarding how our advanced conventional weapons systems might be used to threaten Chinese retaliatory forces. Congressionally mandated studies on exactly that topic—assessing our ability to use conventional munitions against Chinese tunnels that might reasonably be expected to contain nuclear systems—send precisely the opposite signal. Again, China's likely response would simply be more and better nuclear weapons; this is not in the U.S. national interest.

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These changes in China's nuclear capabilities pose challenges, as do the interactions of them with other factors: Chinese threat perception, Chinese territorial claims all along its maritime rim, U.S. reactions to North Korean threats, replacements of aging or obsolescent weapons systems, and changing security threats in the aftermath of the rise of terrorism threat perceptions. I commend the commission for continuing to engage on these matters of national concern.

Updated and corrected version, May 1, 2015

**OPENING STATEMENT OF CHRISTOPHER YEAW, PH.D.  
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DR. YEAW: Commissioner Tobin, thank you for the opportunity to participate in today's hearing. It's an honor to address this vital topic to the Commission.

The evolving nuclear forces, plans and policies of the People's Republic of China present a number of significant challenges to the U.S., allies and partners in the Asia-Pacific region. In my presentation this morning, I will focus on China's possible escalation philosophy and options.

In its strategic forces, China continues to emphasize both survivability--road mobile, sea-based, and eventually dispersed air forces--and penetrability--maneuvering reentry vehicles, multiple reentry vehicles, stealth and hypersonics. This credible, robust, resilient strategic force assures a catastrophic second strike against the United States or Russia even in spite of prior adversary counterforce strikes and missile defenses.

But the primary thrust of recent developments in the Chinese nuclear arsenal may well be the establishment of regional escalatory dominance.

To capture both strategic and theater developments, I would label this latest evolution tentatively as a secure regional de-escalatory posture.

Two notable developments in the theater forces are the rapidly expanding DH-10-based cruise missile force and recent additions to the DF-25/26 theater ballistic missile force. These systems, if existing in nuclear variants, as is widely suspected, would allow for a variety of in-theater nuclear escalation options, and those options would be even more greatly enhanced if any of those warheads allocated to these missiles had low yields.

The principal thrust for a nuclear DH-10/ CJ-10 force, whether ground or air-launched or even naval-launched, would not be strategic strike, of course, but rather precision theater nuclear strike, much as was the conceived functionality of the U.S. GLCM in the 1980s. And the high accuracy of the newest DF-25/26 missiles puts them into the same functional category as the U.S. Pershing-2 MRBM of the 1980s. That is highly survivable, extremely rapid, high precision theater nuclear strike.

While the PLA has never officially named their nuclear posture, nor do they discuss "deescalatory nuclear strikes" as the Russians do, similar thinking seems to lie behind what the PRC is trying to accomplish with its rapidly diversifying and strengthening theater nuclear forces.

As a caution, however, escalatory dominance should not be thought of in a warfighting sense. In fact, the escalation philosophy upon which China's deterrence is generated seems psycho-political rather than warfighting. That is rather than being used in a warfighting fashion intended to defeat the adversary on the battlefield, nuclear weapons would be used in the high-intensity political management of an escalating and perhaps unsustainable conflict.

The multi-domain escalation dynamics within the context of this type of psycho-political escalation philosophy are characterized by non-nuclear operations punctuated by nuclear employment to achieve deescalation on terms favorable to the employer. In the case of China, an early terminal nuclear deescalation attempt accords well with the axiom of winning without fighting.

The lower the stakes for the U.S., the less likely the U.S. will remain in the fight, and the stakes are never lower than at the very outset of the conflict prior to large-scale destruction and casualties. Such an early terminal deescalation attempt would likely take the form of a no or ultra-low casualty, possibly ambiguous, first employment.

Several examples might be the following: an EMP burst over a carrier battlegroup; a fallout-minimizing airburst in the vicinity of Guam; or even a nuclear ASAT strike against a single non-NC3 geo asset.

Failing that first deescalatory attempt, other nuclear punctuations would follow, as intimated in the Science of Secondary Artillery Campaigns doctrinal document, again, within the context of an otherwise non-nuclear high-intensity conflict.

The second punctuation might be a very selective employment of several nuclear weapons in the region against purely military targets, such as an EMP followed by a direct strike against a carrier, a low-yield strike against Andersen Air Force Base, or enhanced radiation bursts on military assets near a Taiwan beachhead, which the PRC claims as its own territory.

Follow-on deescalatory attempts would likely be of a more politically painful type: perhaps a single ICBM strike on Fort Greely, Diego Garcia, causing complications with allies, or even Naval Base San Diego since mainland China will likely have already been struck deeply and repeatedly by this point.

The obvious implication for the United States is that the PRC may escalate across the nuclear threshold at a time and manner and for a purpose that we do not expect. Such an eventuality would put not only U.S. forces at grave risk but also leave U.S. leadership and the president, in particular, as the sole authorizer of nuclear employment in an unenviably unprepared position.

In this way, the PRC may well seek a terminal deescalation of the conflict through selective theater employment of its maturing nonstrategic nuclear force. While we cannot expect an adversary to adhere to our own logic in escalatory philosophy, the real danger comes from assuming that the adversary does share our logic when it does not. That unexpected asymmetry of escalation philosophy could be decisionally crippling in an unfolding conflict.

In fact, China's recent strategic trajectories have been unexpected by most U.S. scholarship. A few notable examples include: development of a blue water navy; debris-generating testing of an anti-satellite weapon; development of national missile defenses; MIRVing ICBMs and SLBMs; incorporation of stealth technologies and the development of a new strategic bomber; and keeping some fraction of nuclear warheads generated rather than in storage.

Indeed, this underestimation of PRC military ambitions and intentions began at least as early as the unexpected, albeit not unwarned, entry into the Korean War.

Possible countermeasures that the United States might take to oppose the prospect of imposed nuclear deescalation can be discussed in the Q&A portion of this hearing, if desired, and I welcome questions.

Again, Vice Chairman and Commissioner, thank you for the invitation to testify on this vital matter to the Commission.

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Prepared Statement**

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**Before  
The U.S.-China Economic and Security Review Commission**

**Hearing on China's Offensive Missile Forces**

**Wednesday, April 1st, 2015**

**Washington, DC**

Vice Chairman Shea and Commissioner Tobin ... thank you for the opportunity to participate in today's hearing on an issue that is vitally important to U.S. national security interests in the Asia-Pacific region. It is an honor to testify here today. The evolving nuclear forces, plans, and policies of the People's Republic of China (China for short hereafter) presents a number of significant challenges for the United States, allies, and friends in the Asia-Pacific region. In my presentation this morning, I will briefly outline the status of China's nuclear forces, especially theater nuclear forces, but will focus on addressing its possible escalation philosophy and options.

#### China's Nuclear Weapons Trajectory

The People's Republic of China has progressed through several phases with respect to its nuclear posture. These phases have been well documented in the literature, and so I will only summarize them here. In the Mao and Deng eras, the emphasis was on developing the ability to threaten delivery of nuclear weapons upon a few major cities of either superpower in order to deter nuclear blackmail. (1) The posture was one of minimum deterrence, and the "no first use" policy made strategic sense within the context of a "people's war," while also making a virtue of a fiscal, societal, and technological necessity. (2)

In the Jiang era, there was a renewed emphasis on survivability and reliability, as adversaries developed conventional forces that might put the liquid-fueled, second-strike ballistic missile force at risk in crisis and conflict. Gulf War I put PRC leadership on notice that their silo-based DF-5 force was vulnerable to a conventional disarming strike. This era saw the rise to prominence of the solid-fueled ballistic missile within China's forces ... opening the way also for thoughts of rapid regional power projection. The posture underwent a subtle shift from minimum deterrence to what the 2006 defense white paper referred

to as “Lean and Effective,” (3) and some have called either “sufficient and effective” or “dynamic minimum deterrence.” (4)

In the Hu/Xi era, China’s rise to power has accelerated, and its sovereignty claims, military forces, and Psyche of centrality have expanded in proportion. Newly achievable regional and global ambitions, together with continued military evolutions in the United States, have required a reassessment of the military tools needed, which in turn has given rise to a subtle but critical evolution in the nuclear posture. In this current era, while there is nominal adherence to the “no first use” policy, there has concurrently been an emphasis on both expanding credible theater nuclear forces and establishing truly secure, penetrating, second-strike forces. While the latest Defense Report on the Military Capabilities of China states that, “China will likely continue to invest considerable resources to maintain a limited, survivable, nuclear force (sometimes described as ‘sufficient and effective’) to ensure the PLA can deliver a damaging retaliatory nuclear strike,” (5) this probably only addresses half of China’s objectives. Instead, to capture both strategic and theater developments, I would label this latest evolution more descriptively as a Secure regional deescalatory posture.

#### Nuclear Force Developments:

The dual thrust of both theater options and secure second-strike forces is clearly demonstrated in the types of forces that are coming on line currently. I will give a brief survey of many these systems and forces here, (6) but there are others inside and outside of the U.S. Government who can speak more definitively to high fidelity descriptions and accurate force numbers.

In line with china’s desire to solidify a truly secure, penetrating, second-strike force, it is pursuing new capabilities along each leg of a nuclear triad: Intercontinental Ballistic Missiles (ICBMs), Strategic Ballistic Missile Submarines (SSBNs), and Long-range bombers. In the first category of ICBMs, China is currently producing or developing several solid rocket missile systems. Over the past decade, China has been producing DF-31 and DF-31A ICBMs to augment its small DF-5 silo-based force. While the modest DF-31 force only barely reaches CONUS, China’s production focus has been the DF-31A, which can range almost all of CONUS from launch areas in China. Beyond the DF-31A, though, China has also embarked upon two other developmental programs: the DF-31B and the DF-41. The attributes of each of these missile systems remain somewhat uncertain, since unlike the open and treaty-bound United States, China rarely reveals details of its strategic missile systems. That said, open source media accounts identify five possible attributes of these new missile programs that emphasize enhancing either survivability or penetrability: multiple reentry vehicles (whether independently-targetable or not), reentry maneuverability, greater accuracy, greater range, and robust overland mobility (vice road-constrained). (7-10)

These latest developments position China’s strategic forces to evolve along a trajectory that may well allow for significant up-load potential in terms of numbers of reentry vehicles. The Chinese ICBM force, rather than being delivery vehicle limited, might become fissile material limited in the near future.

A final development in the intercontinental missile force is the PRC’s pursuit of a hypersonic glide vehicle delivery of nuclear warheads, the WU-14. Just last year, the PRC conducted three test flights of this new developmental system. (11) Of course, such an HGV system would give the PRC the capability for deep, effective, conventional CONUS strikes, and that may well be the primary rationale for development. Adapting a nuclear warhead for those types of extended hot environments would not be trivial, but this new developmental system highlights penetrability, a key attribute for the future strategic

nuclear force. High confidence penetrability opens up its possible inclusion in a nuclear force that emphasizes credible and assured retaliatory strike, even in the face of missile defenses.

China's progress in the area of sea-based strategic forces, with the Type 094 SSBN and its associated JL-2 SLBM, has been well characterized by the U.S. national security community. With an expected fleet of five SSBNs, a size implying continuous at sea deterrent objectives, the survivable second strike force gains valuable resiliency. Nevertheless, given that the 094 is still too noisy to confidently avoid detection and the JL-2 only has a range of about 8000 km, the PRC is also embarked upon the development of both a new SSBN, type 096, and a new associated longer-range missile, the JL-3, longer range and possible MIRVed. (12-13)

While the PLAAF was the first Service to acquire deliverable nuclear warheads, in the form of gravity bombs, it is unclear whether any gravity bombs remain in the arsenal. Of course, if gravity bombs do not remain, the large amount of fissile material that these first inefficient warheads incorporated would have been recycled years ago for use in modern, smaller, more efficient warheads.

Three important developments in the air leg of the Chinese Triad are of note today, though: H-6 modernization, DH-10/CJ-10 production, and stealth bomber development. From the perspective first of strategic strike, the development of a B-2-like stealth bomber along with a long-range refueling platform (a modified H-6, reportedly), would give the PRC a survivable (when dispersed) global-range, flexible, recallable, visible, penetrating nuclear force. Such a force would give PRC leadership a multitude of new and important employment options at both the non-strategic and the strategic/non-cataclysmic level of escalation, as well as the capability to usefully reserve large numbers of weapons for re-strike or for hedging purposes. Such Long-range Stealth capability would also require an investment by the United States in much more capable detection and air defense systems, thus imposing strategic costs on us.

The modernized H-6K would carry a new air-launched version of the DH-10 ground launched cruise missile, the CJ-10. While the vast majority of DH-10s produced to date (and that number is now in the many hundreds) are conventional and to be employed in a precision conventional theater counter-military campaign, it is likely that at least some small number of them have been reserved to carry nuclear warheads. (14-16) The principal thrust for a nuclear DH-10/CJ-10 force, whether ground or air (or naval) launched would not be strategic strike, of course, but precision theater nuclear strike, much as was the conceived functionality of the U.S. GLCM in the 1980s.

Finally, from a theater nuclear strike perspective, there is the most recent additions to the DF-25/26 force. If any of the variants of these missiles are nuclear, as is widely held, (17) the high accuracy puts them into the same functional category as the U.S. Pershing-2 MRBM of the 1980s ... that is, highly survivable, extremely rapid, high precision theater nuclear strike. These systems would allow for a variety of in-theater nuclear escalation options, and those options would be even more greatly enhanced if any of the warheads allocated to these missiles had low yields, on the order of sub-kiloton or single-digit kilotons.

Additional possible nuclear weapons are possible, though only implicated by association in open media. For example, the Kilo-class subs that China bought from Russia are capable, if modified modestly, of launching nuclear-armed anti-ship cruise missiles, in accord with historic Russian doctrine and practice. Do such cruise missiles exist in China? We simply don't know. Again, there is the possibility that the ballistic missile defense system that China is developing could employ nuclear-tipped interceptors. The terminal engagement solution would be far less demanding, particularly against maneuvering reentry vehicles, and the analogous Russian system is at least partially nuclear. So, is the Chinese system also nuclear? Again, we don't know. Reports of enhanced radiation warheads on SRBMs (by Zhao Xijun, former deputy commander of Second Artillery, for example) and EMP applications have also been raised. (18) Our definitive knowledge of the types of nuclear warheads and

weapons comprising China's arsenal is quite sparse. In fact, there is such a dearth of transparency and reliable, complete open source information that scholars even continue to debate whether the PRC retains nuclear gravity bombs.

### China's Evolving Doctrine and Policy

Perhaps more important than the issues of the types and numbers of nuclear forces that the PRC is acquiring and deploying are the issues surrounding when, how, why, and against what targets these forces might actually be employed in an evolving conflict. These more ephemeral issues have historically been much more difficult for the U.S. national security community to address with confidence. These are the issues to which I'd like to turn my attention now.

In the first place is the issue of the No First Use pledge (NFU hereafter). There has been a considerable amount of debate devoted to this topic over the course of the past few years, and I will not review it all here. Suffice it to say that even the United States holds to a "No First Use" hope, encapsulated in the NPR statement, "the United States wishes to stress that it would only consider the use of nuclear weapons in extreme circumstances to defend the vital interests of the United States or its allies and partners." (19) The state of the debate in China on this issue is not completely known, but it is unlikely that China will walk away from this declaratory pledge anytime soon, since the political costs greatly outweigh the deterrent gains. The real question, therefore, is whether the PRC holds to this doctrine in its most secret of plans, or there is a gap between declaratory policy and war planning, as there has been at times in our own history. Obviously, it is not possible to know this from open source information. In light of a number of statements that will be sampled below, some made in official doctrine, war planning does not seem in accord with strict NFU. Particularly, we would expect that any break with NFU would come under very stressful conditions and would likely consist of theater nuclear strikes.

Before addressing the regional deescalatory posture, though, backstopping all is the continuing and augmented secure second-strike force. Historically, China has only seen the need to credibly threaten the destruction of some number of its adversaries' major cities. As Deng put it, "if you want to destroy us, you will face some retaliation." These major targets would be chosen for their military, political, and symbolic value. While this is a level of escalatory intensity that is almost inconceivable, China must assure its adversary that the threat is entirely credible, hence the continued emphases on both survivability (road mobile, sea-based, and, eventually, dispersed air forces) and penetrability (maneuvering, multiple reentry vehicles, stealth, and hypersonics). This credible, robust, resilient strategic force assures a catastrophic second strike on the U.S. or Russian homeland, in spite of prior adversary counterforce strikes and missile defenses. This primary role of secure second strike is why there is such an emphasis in Second Artillery training on operating under the grim conditions of a nuclearized environment. (20)

The primary thrust of recent developments in the Chinese nuclear arsenal, though, may well be the establishment of regional escalatory dominance. While the PLA has never officially named their nuclear posture, nor does it discuss "deescalatory nuclear strikes" as do the Russians, similar thinking lies behind what the PRC is trying to accomplish with its rapidly diversifying and strengthening theater nuclear forces.

As a caution, however, escalatory dominance should not be thought of in a warfighting sense. In fact, the escalation philosophy upon which China's deterrence is generated is psycho-political rather than warfighting. Put another way, the PRC looks at deterrence not so much as the U.S. Looked at deterrence in the 1960s and 70s, but more in accord with how France looked at deterrence in the Cold War. That is, rather than being used in a warfighting fashion intended to defeat the adversary on the battlefield, nuclear



weapons would be used in the high intensity political management of an escalating and perhaps unsustainable conflict.

A few examples from recent writings and doctrine are illustrative of this thinking. “When we are under the pressure of circumstances to use military force to reunify the motherland’s territory, we may even lower the threshold of using nuclear weapons to deter intervention by external enemies.” (21) “When conventional warfare continues to escalate and the overall strategic situation is extremely unfavorable to us, and when national security and survival are seriously threatened, in order to force the enemy to stop its war of invasion and save the country from danger, the nuclear missile units should follow the orders of the supreme command and carry out effective nuclear deterrence against the enemy.” (22) The Second Artillery should be capable of “carrying out a number of waves of nuclear missile strikes after initial nuclear strikes ... in order to maintain the huge amount of pressure and psychological fear against the enemy.” (23) Certain conventional attacks would “be seen as breaking the nuclear threshold,” with the result that China “will find it difficult to refrain from a nuclear counterattack.” (24) Nuclear strikes against focal points are aimed at “stopping the enemy at the first opportunity.” (25)

The escalation dynamics within the context of a psycho-political escalation philosophy are characterized by non-nuclear operations punctuated by nuclear employment to achieve deescalation on terms favorable to the employer. In the case of China, an early terminal nuclear deescalation attempt accords well with the axiom of winning without fighting. The lower the stakes for the U.S., the less likely the U.S. will remain in the fight, and the stakes are never lower than at the very outset of conflict, prior to large-scale destruction and casualties. Such an early terminal deescalation attempt would likely take the form of a no- or ultra-low-casualty, possibly ambiguous first employment. A couple of examples might be the following: an EMP burst over a carrier battle group, a fall-out-minimizing air-burst in the vicinity of Guam, or even a nuclear ASAT strike against a single non-NC3 GEO asset.

Failing that first deescalatory attempt, other nuclear punctuations would follow, as intimated in the SSAC doctrinal document, again within the context of an otherwise non-nuclear, high-intensity conflict. The second punctuation might be a very selective employment of several nuclear weapons in the region against purely military targets, such as an EMP followed by direct strike against a carrier, a low yield strike on Andersen AFB, or enhanced radiation bursts on military assets near a Taiwan beachhead (which the PRC claims as its own territory). Follow-on deescalatory attempts would likely be of a more politically painful type: perhaps a single ICBM strike on Ft. Greely, Diego Garcia (causing complications with allies) or even Naval Base San Diego (since mainland China will likely have already been struck deeply and repeatedly).

The obvious implication for the United States is that the PRC may escalate across the nuclear threshold at a time and manner, and for a purpose, that we do not expect. Such an eventuality would put not only U.S. Forces at grave risk but also leave U.S. leadership, and the President in particular as the sole authorizer of nuclear employment, in an unenviably unprepared position. In this way the PRC will seek a terminal deescalation of the conflict through selective theater employment of its maturing non-strategic nuclear force. While we cannot expect an adversary to adhere to our own logic in escalation philosophy, the real danger comes from assuming that the adversary does share our logic when it does not. That unexpected asymmetry of escalation philosophy could be decisionally crippling in an unfolding conflict.

Though many scholars might claim that characterizing China’s evolving nuclear policy as a secure regional deescalatory posture is over aggressive, it seems to fit the recent trajectory. China’s recent strategic trajectories have historically been underestimated by most U.S. Scholarship. A few notable examples include: development of a blue water navy; debris-generating testing of an anti-satellite weapon; development of national missile defense; MIRVing ICBMs and SLBMs; incorporation of stealth technologies and development of a new strategic bomber; and keeping some fraction of nuclear warheads

generated rather than in storage. Indeed, this underestimation of PRC military ambitions and intentions began at least as early as its unexpected, albeit not unwarned, entry into the Korean War.

Possible countermeasures that the United States might take to oppose the prospect of imposed nuclear deescalation include, but are not limited to: adequate planning for appropriate response options to China's crossing the nuclear threshold; exercising CONUS-based theater nuclear operations in the Pacific to assure allies; publicly considering the reintroduction of non-strategic nuclear forces into the Pacific theater; diplomatically pressing the PRC to enter into the INF Treaty, or perhaps a slightly modified version of the treaty; declaring that any employment of a nuclear warhead will be met with a proportional response; etc.

Another strategic outcome from the continued expansion of the Chinese nuclear force, hinted at in the preceding paragraph, regards assurance of our Asia-Pacific allies. As the United States debates the merits of further reductions, the possibility of going from our resilient Triad to a dyad, and the desire of some to pull B61s out of Europe, our Asia-Pacific allies see a very different trajectory and resolve in the PRC. While the U.S. Currently holds a significant numeric superiority in strategic weapons, in the area of theater nuclear weapons, which are in fact more credible, the PRC enjoys a decided and growing advantage in both numbers and types of weapons. This asymmetry has been disconcerting to our partners, particularly Japan and Taiwan. Though this imbalance can be creatively mitigated by the planned employment of other nuclear forces, if this asymmetry continues and grows further, it may well result in either or both of these partners reconsidering the possibility of independent nuclear weapon acquisition, citing in particular China's trajectory as being directly counter to Article VI of the NPT.

Finally, as briefly mentioned above, various scholars and pundits in the United States have suggested that the U. S. Might trim our nuclear forces by eliminating the ICBM leg of the Triad. This foolhardy suggestion would result in a dyad that almost irresistibly incentivizes the PRC to both develop strategic antisubmarine capabilities and plan to execute a devastating disarming first strike unexpectedly early in a conflict. While that scenario may be difficult to imagine, any war with China is a very uncomfortable thought. Such a first strategic strike would only have to consist of some dozen precision HGV nuclear strikes on CONUS, together with anti-sub strikes at sea. The results of such a relatively small strike would be disproportionately devastating - few or no remaining deliverable U.S. nuclear weapons. Without both the enormous escalation potential imposed and warhead sink represented by a distributed, extensive missile field, the United States could be put in an incredibly precarious position, and our partners would seriously and rightly consider going nuclear themselves.

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**OPENING STATEMENT OF JAMES ACTON, PH.D.  
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DR. ACTON: Commissioner Tobin, Mr. Chairman, members of the Commission, it's a genuine honor to testify before you today, and I thank you very much for this invitation.

There's two separate issues that I'd like to focus on. First, China's nuclear modernization and its nuclear doctrine and the possibility that those might change. And then to discuss at slightly more length the status and drivers of China's development of hypersonic boost-glide weapons.

So turning first to China's nuclear modernization, the People's Liberation Army, as both my colleagues have noted, is slowly building up its nuclear forces, and this trend seems set to continue for the time being. I think it's important to realize, however, that this trend cannot continue indefinitely because Beijing only possesses a limited amount of fissile material, plutonium and highly enriched uranium, which is required to manufacture nuclear explosives.

And, moreover, it appears that China is currently exercising an undeclared moratorium on further production.

Unclassified attempts to estimate the size of China's fissile material stockpile have reached the conclusion that Beijing only produced enough material for a nuclear arsenal numbering somewhere in the hundreds. So unless Beijing chooses to reactivate fissile material production, which the United States would likely be able to detect, that will place some kind of cap on the total size of China's arsenal.

That said, the most striking changes to China's nuclear forces are qualitative, not quantitative. The PLA is significantly enhancing their mobility and hence their survivability by the deployment of new road-mobile ballistic missiles, the development of the Jin-class submarine, and the JL-2 sea-launched ballistic missile.

The PLA appears to be genuinely concerned about the survivability of its nuclear forces, especially over the longer-term, and these concerns are in large part I believe a motivation behind this modernization.

China's no-first-use pledge has been a core feature of its nuclear doctrine since 1964, and it remains so today. However, it does appear that some PLA strategists, especially those who worry about the potential for conventional attacks on China's nuclear forces, worry about no-first-use, and the omission of no-first-use from China's 2013 defense white paper I believe was a reflection of this dissention.

Now, given that the no-first-use pledge has been such a central element of China's doctrine for so long, I think the barriers to change are extremely high, though they may not be entirely insurmountable. However, rather than outright renunciation of no-first-use, I believe it's possible that we'll see continued attempts by the PLA to deemphasize and perhaps inculcate ambiguity.

One feature of China's doctrine that I believe is more likely to change than no-first-use is its policy of de-alerting, that is of storing warheads separately from delivery vehicles. And I note that Chris implied that that policy may already have changed. The 2013 edition of Science of Military Strategy openly raises the possibility of launching on warning to an oncoming attack, which implies that warheads would have to be alerted. Moreover, China's apparent pursuit of strategic early-warning capabilities only makes sense if it can respond to warning of an attack through launch on warning, which again would require warheads not to be de-alerted.

Let me turn now to China's boost-glide weapon development program. A boost-glide weapon, like a ballistic missile, is launched by a large rocket, but unlike a ballistic missile that arcs high over the atmosphere, a boost-glide system reenters the atmosphere quickly on a relatively flat trajectory if, indeed, it leaves the atmosphere at all. Then it glides entirely unpowered to its target.

It's been widely reported that in 2014 China conducted three boost-glide tests. I would, however, caution that it's not possible to definitely confirm the nature of the third test.

There is no reliable evidence about the outcomes of the first and third tests. However, we can say more about what happened in the second test based on both warnings that China put out to warn its pilots

of falling debris and also pictures of a crash site that appeared on Chinese social media. Taken as a whole, this information suggests the test was a failure. And let me acknowledge my colleagues, Jeffrey Lewis and Catherine Dill, who analyzed this information with me.

In light of this, let me offer three very cautious conclusions about China's boost-glide development program. First, there is considerable uncertainty about many aspects of this program, and many of the claims in media reports, such as the speed of the glider, are extremely questionable, I believe.

Second, the available evidence very tentatively suggests that China's hypersonic glider development program is less advanced than the United States'. The flight plan for the second test was much less ambitious, both in terms of range and cross-range maneuvering than contemporary American tests. It is, of course, important to be very cautious and not generalize too much on the basis of one test so continued observation of the program is very important.

And third, regardless exactly of the nature of the glider or gliders that China tested last year, it is likely to face very significant difficulties in developing gliders with long ranges.

There is also significant uncertainty about why China is pursuing boost-glide technology. I think it's even possible the PLA does not currently have firm ideas about whether it intends to arm its gliders with conventional and nuclear warheads or even that the deployment of such weapons, while probable, is certain.

Assuming that China does ultimately deploy boost-glide weapons, the critical question, as I've said, is whether the payload is nuclear or conventional. If the PLA's ultimate decision is to integrate a nuclear warhead, it will probably reflect continued concerns about China's ability to penetrate U.S. missile defenses, and in that case, nuclear-armed gliders would essentially serve to reinforce the status quo.

By contrast, if the PLA deploys a boost-glide system armed with a conventional warhead, then it may be seeking long-range conventional strike capabilities, including against the United States. I think this would signal a desire on the part of China to perhaps have the capability to change the status quo by force.

And it is, of course, possible that China could deploy both nuclear arms and conventional gliders, and on that note let me conclude my testimony and say I'm very much looking forward to the follow-on discussion.

**PREPARED STATEMENT OF JAMES ACTON, PH.D.  
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April 1, 2015  
Hearing on “China’s Nuclear Weapons and Emerging Missile Technologies”

James M. Acton  
Senior Associate and Co-Director of the Nuclear Policy Program,  
Carnegie Endowment for International Peace

Testimony before the U.S.-China Economic and Security Review Commission

Mr. Chairman, members of the Commission,

It is a genuine honor to testify before you today. I am a theoretical physicist turned policy wonk, who for almost a decade has worked on nuclear deterrence, disarmament, nonproliferation, and nuclear energy. While I do not claim to be a China expert *per se*, I do have expertise in both nuclear deterrence and hypersonic weapons. In 2013, I authored a book-length study on the development of prompt, long-range, conventional strike capabilities, *Silver Bullet?: Asking the Right Questions About Conventional Prompt Global Strike*, and have since published a number of pieces about China’s efforts in this area.

Today, I would like to address four issues: (i) the drivers and possible extent of China’s nuclear modernization program; (ii) the possibility of changes to China’s nuclear doctrine; (iii) the technical status of China’s hypersonic boost-glide weapon development program; and (iv) the strategic drivers and implications of China’s pursuit of boost-glide technology. The discussion of China’s force modernization and nuclear doctrine will help to set the context for understanding the possible drivers of its boost-glide program.

**China’s Nuclear Forces: Future Build-up and Trajectory**

The People’s Liberation Army (PLA) is slowly building up its nuclear forces and this trend seems likely to continue for the time being. Without significant resource investments, however, it cannot continue indefinitely since Beijing possesses only a limited quantity of fissile material, which is required to manufacture nuclear explosives. All unclassified attempts to estimate the size of China’s fissile material stockpile by analyzing the capacity and operation of its enrichment plants and plutonium-production reactors have reached the conclusion that China only produced enough material for a nuclear arsenal numbering in the hundreds. It appears that China is currently observing an undeclared moratorium on further production. Admittedly, this moratorium is much more difficult to verify for highly enriched uranium than for plutonium. However, assuming China uses plutonium primaries in its nuclear weapons, which the fall-out from atmospheric testing suggests and is desirable for miniaturization, the moratorium on further plutonium production is enough, by itself, to cap the size of China’s arsenal.

China could try to spread its existing fissile material stockpile more thinly by attempting to improve its weapon designs so each warhead uses less material. However, in the absence of renewed nuclear testing, this change would be difficult and would probably involve significant technical risk. Even if it were successful, this approach might allow for, say, a 25% increase in arsenal size, but probably not much more. Alternatively, Beijing could decide to manufacture more fissile material. While this eventuality cannot be ruled out, it would probably be detected by U.S. intelligence at an early stage.

The most striking of the changes to China’s nuclear forces are qualitative, not quantitative. In particular,

the PLA is significantly enhancing their mobility—and hence improving their survivability—by its deployment of new road-mobile missiles, and its development of the *Jin*-class submarine and JL-2 sea-launched ballistic missile. China’s submarines may have attracted more attention but the PLA’s road-mobile missiles are almost certainly more survivable given the relatively high noise levels associated with China’s second-generation nuclear-powered submarines, the expertise of the U.S. Navy in anti-submarine warfare, and the extraordinary difficulty of tracking and destroying mobile targets in a huge country with robust air defenses.

The PLA appears to be genuinely concerned about the long-term survivability of its nuclear forces and these concerns are, in part at least, a motivation for its force modernization. As Jeffrey Lewis has noted, development of the DF-21 medium-range ballistic missile began in the late 1970s, while the decision to procure the DF-31 and DF-41 intercontinental ballistic missiles (ICBMs) was taken in 1985. China’s decision to develop more survivable mobile missiles at that time—when its nuclear forces were smaller and much more fragile than they are now—suggests it was motivated by survivability concerns, rather than more offensive purposes.

Three decades later, these concerns remain—although they have evolved. Today, in addition to worrying about the threat of a nuclear first strike by the United States, Chinese military thinkers increasingly express concerns about a conventional first strike. They tend to talk generally about “conventional strategic strike capabilities” or simply “conventional weapons,” suggesting their concerns are broader than any one specific weapon system. One important illustration of this concern comes from a classified 2004 PLA textbook, *Science of Second Artillery Campaigns*, which identifies China’s “nuclear missile troops and their launch sites” as “the core targets” of an adversary’s pre-emptive attacks. It then calls upon the Second Artillery Corps, the PLA’s missile branch, to prepare defenses

against the precision guided weapon attacks launched from the enemy’s land (sea) platforms, against weapon attacks delivered from the enemy’s aerial platforms, and against the attacks mounted by the enemy’s airborne troops, and attacks and harassments carried out by the enemy’s special operation forces.

It is clear from the subsequent text that “precision guided weapons” refers to cruise missiles such as the Tomahawk. Most noticeable, however, is the reference to airborne and special operations forces as a threat to China’s nuclear weapons. To see such concerns highlighted in what most American experts consider an authoritative Chinese document is striking. Other Chinese authors, especially in recent years, have highlighted concerns about U.S. programs to develop long-range, hypersonic, conventional strike capabilities. Indeed, this concern is specifically highlighted in the 2013 edition of the PLA’s unclassified textbook, *Science of Military Strategy*.

Chinese strategists have also expressed serious concerns about current and particularly future U.S. ballistic missile defenses, including the possibility that, in combination with conventional counterforce capabilities, they could allow the United States to disarm China without crossing the nuclear threshold. As I will discuss, China’s development of boost-glide technology may be a response to this fear. Its development of multiple independent re-entry vehicle (MIRV) technology may be another response; indeed, the U.S. Department of Defense assessed explicitly in its 2014 report on *Military and Security Developments Involving the People’s Republic of China* that this is the case. However, I would not rule out the possibility that MIRV technology may have been developed as a way of reducing the costs of a larger arsenal, or that different constituencies within the Chinese military and government have supported it for different reasons, as was the case in the United States.

Finally, while less discussed, it is also possible that internal considerations—not just external ones—shape Chinese policy in important ways. After all, U.S. and Soviet/Russian nuclear-weapon decisions—



particularly over procurement—were not based solely (or perhaps even mostly) on cold-blooded cost-benefit calculations. They were shaped by bureaucratic and political factors. The Kennedy administration, for example, increased defense spending, including the construction of more nuclear weapons, to stimulate the U.S. economy. Meanwhile, according to a detailed study of Soviet nuclear policy based on interviews with senior decision-makers conducted just before and after the collapse of communism, Soviet acquisition policy was largely driven by the defense-industrial sector's use of "its political clout to deliver more weapons than the armed services asked for and even to build new weapon systems that the operational military did not want." While the specific internal factors at play in China may be rather different, I would not assume they are absent.

### **China's Nuclear Forces: Doctrinal Tensions and Developments**

China's no-first-use pledge has been a core feature of its nuclear doctrine since 1964 and remains so today. However, it appears to concern some PLA strategists, especially those who worry about the potential for conventional attacks on China's nuclear forces. The omission of the pledge from China's 2013 defense white paper was, I believe, a reflection of this dissention. To be sure, Beijing quickly restated the pledge when questioned, so I no longer believe that the white paper was intended to signal a change in policy. However, neither do I believe the explanation, offered by Chinese experts and officials, that the white paper was "thematic" rather than "comprehensive," and that the no-first-use pledge was omitted because it was not relevant to the theme (the diversified employment of China's armed forces). After all, in a section closely resembling language in prior defense white papers, the 2013 edition contains a description of how China would alert its nuclear forces in response to a perceived nuclear threat, and retaliate with nuclear weapons to a nuclear strike; the only meaningful difference is the omission of the no-first-use pledge.

I am inclined to judge that this omission hints at an ongoing internal debate within the Chinese military. Indeed, in an op-ed entitled *China Will Not Change its Nuclear Policy*, Maj. Gen. Yao Yunzhu of the PLA Academy of Military Sciences, the organization that produced the white paper, wrote that "speculations on a possible change to the [no-first-use] policy have not been conjured up without reason." She states that internal criticism of no-first-use is fueled by concerns about U.S. strategic conventional strike capabilities and ballistic missile defense.

Given that China's no-first-use pledge has been central to its nuclear doctrine for over 50 years, the barriers to change are surely very high, although they may not be entirely insurmountable. However, more likely than outright renunciation, I believe, are continued attempts by the PLA to de-emphasize no-first-use and perhaps to inculcate ambiguity. Given the PLA's concerns about U.S. conventional capabilities, China would presumably be less likely to renounce or deemphasize no-first-use if its on-going modernization results in increased confidence in the survivability of its nuclear forces. I am, however, not convinced that force survivability is the only relevant consideration. If, for example, the United States can maintain its conventional superiority in the western Pacific, there may be increased pressure within China to reevaluate no-first-use.

A feature of Chinese doctrine that I believe is more likely to change is its policy of de-alerting, that is, of storing warheads separately from delivery systems. The 2013 edition of *Science of Military Strategy* openly raises the possibility of launching on warning of an incoming attack. This strategy would require Chinese nuclear forces to be alerted in a crisis or, perhaps even, on a day-to-day basis. Moreover, two on-going technical developments also point to the possibility of a change.

First, China appears to be enhancing its strategic early-warning capability. In the last few years, the Pentagon has hinted that China has recently upgraded its land-based early-warning radars, and may be considering further improvements. Moreover, there have also been reports that China is developing a space-based early-warning system. Early warning is, however, of little value with a de-alerted force. After

all, states generally seek strategic early-warning capabilities to enable launch on warning.

The second reason to question whether China will continue to field de-alerted forces is its development of the *Jin*-class submarine. To my knowledge, there is no authoritative, unclassified information about whether China intends to de-alert its sea-launched ballistic missiles. From a technical perspective, it is entirely possible to do so (warheads could either be stored on land or in empty launch tubes on the submarine). However, de-alerting would seriously compromise submarine force survivability. There is, therefore, I believe a significant chance that Chinese sea-launched ballistic missiles will be mated with warheads during submarine patrols. Once the PLA Navy has set this precedent, the Second Artillery Corps may face less resistance in doing likewise. Indeed, from a technical perspective, the Second Artillery Corps' increasing use of solid-fueled, road-mobile ballistic missiles, which can reportedly be launched within minutes of an order to do so, would facilitate its adoption of a launch-on-warning posture.

### **China's Boost-Glide Program: A Technical Assessment**

"Hypersonic speeds" are usually defined to mean at least five times the speed of sound. There are three basic approaches to delivering a payload accurately over long ranges at such speeds: terminally guided ballistic missiles, boost-glide weapons, and hypersonic cruise missiles. I will not discuss hypersonic cruise missiles in any depth, but will note that a number of experts, including Mark Stokes and my former Carnegie colleague Lora Saalman, have found considerable evidence that China, like the United States, is conducting extensive research in this area. While I am aware of no evidence that China has flight-tested a scramjet engine—the type of propulsion system that would be required for sustained hypersonic flight—it should come as no surprise if China does so within the next few years.

A boost-glide weapon, like a ballistic missile, is launched by a large rocket. However, rather than arcing high above the atmosphere, a hypersonic glider is launched on a flatter trajectory that either re-enters the atmosphere quickly or does not leave it at all, before gliding unpowered to its target. How far a re-entry vehicle can glide depends on its initial speed and its aerodynamic performance. In theory, gliders with global ranges could be developed, but no state has successfully flown one anywhere near that distance.

Although terminally guided ballistic missiles and boost-glide weapons have quite different trajectories, they are not fundamentally different technologies; rather, they lie at different ends of the spectrum of maneuvering re-entry vehicles. The more aerodynamic lift that such a re-entry vehicle generates, compared to the drag it encounters, the farther it can glide.

I mention this point because China's boost-glide program may well be an outgrowth of its program to develop terminally guided ballistic missiles (just as American efforts to develop hypersonic gliders can trace their lineage back to U.S. programs to develop terminally guided re-entry vehicles in the 1960s and 1970s). China has developed such missiles, including the DF-21C and DF-21D, for the purpose of delivering conventional warheads. Given the relatively short range of China's glider tests—a point I will return to at greater length—it is possible, though by no means certain, that the glider is essentially a "souped-up" version of an existing type of terminally guided re-entry vehicle (though without access to the design of the glider it is difficult to say much definitively).

In any case, it has been widely reported that, in 2014, China conducted three tests of a hypersonic glider, dubbed WU-14 by the news media, on January 9, August 7, and December 2. (Given what is known about the Department of Defense's naming conventions for foreign space and missile systems, WU-14 probably refers to the booster, although it has now become the *de facto* name of the glider.)

At least one senior American official has unequivocally and publicly confirmed the U.S. assessment that the January 9 test did involve a hypersonic glider—and, given the range of information sources available

to the United States government, I do not doubt that assessment. Because the keep-out zone declared by China for this test was identical to one of the zones declared for the August 7 test, it seems virtually certain that this second test also involved the same glider. I am less certain about the third test. Beijing has acknowledged it tested *something* on December 2 but, contrary to media reporting, it did not explicitly confirm that the something was a hypersonic glider. The U.S. government has also not confirmed the nature of this test. In the absence of additional information, such as the keep-out zones for this test (which I have not been able to obtain), it is not possible to definitively confirm media reports that the December 2 test involved a boost-glide vehicle.

There is no reliable evidence about the outcomes of the first and third tests in open sources, but it is possible to say more about the August 7 test. My analysis of this test was conducted jointly with Jeffrey Lewis and Catherine Dill of the James C. Martin Center for Nonproliferation Studies, and I gratefully acknowledge them.

Ahead of the test, China released two keep-out zones in its own territory, warning pilots of falling debris. These zones enable two conclusions to be drawn.

- The plan for the August 7 test appears to have been to test the glider to a range of 1,750 km. To put this figure in perspective, it is not much longer than the estimated range of the DF-21D. Moreover, it is much shorter than the range of the U.S. Advanced Hypersonic Weapon, a glider which has been successfully tested across 3,800 km and was due to be tested across more than 6,000 km in August 2014 before the test was cut short by a booster failure.
- The flight path for the August 7 test involved almost no cross-range maneuvering. One of the main advantages of gliders is that they are capable of maneuvering perpendicular to their velocity. Indeed, the U.S. test in August 2014 was supposed to involve a cross-range maneuver of hundreds of kilometers. The planned flight path for China's test was, by contrast, almost completely straight.

At the same time as the test, pictures of rocket debris appeared on Chinese social media. There is sufficient information in the photos to geolocate the crash site (which turns out to be a few kilometers from the *Bulong Hu* hot springs resort in the Ordos Desert). Two more conclusions can be drawn from this information.

- First, the booster used in the test was liquid-fueled. The orange cloud around the crash site shown in the photographs is characteristic of the  $\text{N}_2\text{O}_4$ /UDMH liquid rocket propellant used in all *Long March* rockets, which are derived from China's long-range, liquid-fueled missiles.
- Second, the test appears to have been a failure, as the crash site lies outside the declared drop-zones and uncomfortably close to the resort. The large quantity of unburnt fuel left in the rocket stage (or stages) that crashed also suggests a premature termination of the flight.

These observations summarize what we know with at least some confidence about the status of China's boost-glide development program (though perhaps Mandarin speakers can glean additional information from the Chinese literature). Against this background, I offer three cautious conclusions.

First, there is considerable uncertainty about many basic aspects of China's glider. How fast does it travel on re-entry? What is its lift-to-drag ratio? What guidance system does it use? How accurately can it hit a target? Was the technology developed indigenously or is it based on classified foreign sources? In fact, we can't even be certain that China has tested only one glider design.

Many claims about the glider in media reports—such as its speed—are highly questionable. I believe that, in a number of cases, Chinese journalists, who know effectively nothing about the program, simply copy descriptions of U.S. programs. The claims made in these articles then are portrayed in the U.S. press as accurate descriptions of China’s program. Let me give an example. An article in *Aviation Week* that described the January 7 test contained a picture of a glider published in a “Chinese academic engineering article.” However, as a Google search immediately revealed, this picture was of the U.S. Advanced Hypersonic Weapon, and not an indigenous Chinese glider.

On the question of the origins of China’s technology, Lora Saalman has found that the unclassified Chinese literature on hypersonic gliders draws very heavily from the *unclassified* American literature on the same subject. There is little doubt that Chinese scientists pay very close attention to U.S. developments and may even be trying to copy them. However, I have no evidence—one way or the other—as to whether China’s program uses classified foreign information acquired by espionage.

Second, the available evidence very tentatively suggests that China’s hypersonic glider development program is significantly less advanced than the United States’. The flight plan for the August 7 test was much less ambitious—in terms of both its range and its lack of cross-range maneuvering—than contemporary American tests. Of course, it is important to be very cautious about generalizing on the basis of one test. It is possible that the range of the December 2 test (if it occurred) was longer. Indeed, I cannot say with confidence whether the flight plan for the August 7 test indicates that the glider has a limited capability, or that China has adopted a gradual and cautious pattern of flight-testing. The United States, for example, did not immediately test the AHW to its full potential range, so there is a precedent for an evolutionary approach to flight-testing. Continued observation of the program may shed more light in due course.

Third, regardless of the exact nature of the glider tested last year, China is likely to face significant difficulties in developing gliders with very long ranges (i.e. a few thousand kilometers or more). The development of such gliders severely exacerbates the engineering challenges associated with shorter-range systems, such as managing the heat that is generated through atmospheric friction. It also creates qualitatively new challenges, such as accurate navigation over long ranges. The United States has chosen the Global Positioning System, or GPS, for this purpose. China has started to deploy its own space-based precision navigation and timing system, *Beidou*, which is eventually intended to provide global coverage. Nonetheless, ensuring the reception of navigation data during all stages of the boost-glide flight path presents its own set of technical difficulties. Given sufficient time and resources, China should be able to overcome this challenge, just as the United States seems to have done, as well as the many other obstacles it would face. However, the development of long-range gliders is unlikely to be quick or painless; it is certainly not a case of just putting a glider never tested at long ranges, and perhaps not designed for long-range flight, on top of a more powerful booster.

It is certainly possible, by examining the available data selectively, to paint a picture of Chinese hypersonic boost-glide capabilities that are already advanced and rapidly evolving. Overall, however, the evidence available to the public does not support categorical statements about whether the existing Chinese glider would be an effective weapon, or about the pace at which the program will progress. This is not to say that the more alarmist accounts are necessarily wrong, but it is to argue that there is a significant degree of uncertainty. Some of this uncertainty derives from our lack of knowledge about China’s program. However, the uncertainty is not purely epistemic; given the limited number of tests, which probably includes one failure, even the PLA may be unsure of how close it is to a capability that is reliable enough to be deployed.

### **China’s Boost-Glide Program: Strategic Drivers and Implications**

There is significant uncertainty about why China is pursuing boost-glide technology. Assuming that China successfully completes the development of such a system and deploys it, a critical issue will be whether the payload is nuclear or conventional. If the PLA's ultimate decision is to integrate a nuclear warhead, it will probably reflect concerns about China's continued ability to penetrate U.S. missile defenses, including potentially more capable future defenses. In this case, the deployment of boost-glide systems would serve to preserve the status quo. By contrast, if the PLA deploys a boost-glide system armed with a conventional warhead, then it may be seeking longer-range conventional strike capabilities including, perhaps, the ability to target the continental United States. In this case, the glider program could signal that the PLA sees a growing role for strategic conventional weapons in its military doctrine. Of course, it is also possible that China could deploy both conventionally armed and nuclear-armed gliders.

That said, it is possible the PLA does not currently have firm ideas about the purpose of a boost-glide system. China has a well-documented history of initiating advanced strategic military programs mainly because it worries about other states' opening up a technology gap, without necessarily being convinced by their ultimate military utility for China. Such technologies, including the neutron bomb, are not always fielded. The deployment of boost-glide weapons, while probable, should, therefore, not be regarded as a given.

Lee Fuell from the National Air and Space Intelligence Center has testified to this committee that his organization assesses that the glider program is associated with China's nuclear forces. Mr. Fuell has access to sources of information that I do not, and I have no particular reason to doubt his assessment. That said, the information I have at my disposal does not enable me to draw a conclusion about any intended payload.

The one piece of evidence that may suggest China's aim is to arm a boost-glide system with a nuclear warhead is its use of a liquid-fueled booster (today, China's liquid-fueled missiles are used exclusively to deliver nuclear weapons). However, there are other possible explanations for this choice of booster. It may have been dictated by the technical requirements of the mission (including the mass of the glider and required injection speed). Alternatively, like the United States, China may simply use decommissioned nuclear missiles for testing hypersonic gliders on cost grounds.

Much has been made about the potential of hypersonic gliders to penetrate U.S. missile defenses, although some nuance is needed to understand the full implications. In broad terms, defenses can be divided into area defenses, which are capable of protecting large swathes of territory, and point defenses, which are capable of protecting particular targets or small clusters of targets. The Ground-Based Mid-Course Defense system deployed in Alaska and California to protect the United States against a North Korean ICBM by intercepting warheads as they pass through outer space is an example of an area defense. Patriot missiles, which are designed to intercept short-range missiles in their terminal phase, are examples of point defenses.

A sports analogy may be helpful. Area defenses are the military equivalent of football's defensive linemen, who try to knock down a pass as soon as it leaves the quarterback's hands to protect the whole of the downfield area. Area defenses require an incoming missile to be intercepted early in flight while it can still reach a large number of potential targets. For technical reasons, gliders are very difficult to track early in flight, and hence would probably be particularly effective at defeating area defenses. As a result, Chinese nuclear-armed intercontinental gliders could help China's military to extend the existing strategic balance into the foreseeable future. More ominously, if those gliders were accurate enough to deliver conventional warheads, they could expose the United States to a qualitatively new threat that would be extremely difficult to defend against.

Point defenses are different. They are the equivalent of a cornerback shadowing a wide receiver downfield. It is much easier for a cornerback to knock down a pass than a defensive lineman, but the cornerback can only protect a very small part of the playing field. Against China, point defenses play an important role in defending U.S. and allied military assets in the western Pacific. Hypersonic gliders would probably be somewhat *less* effective at penetrating these defenses than China's existing ballistic missiles. Although hypersonic gliders re-enter the atmosphere at extremely high speeds, they slow significantly over the course of their trajectory because of air resistance, making them potentially easier to intercept close to a defended target, compared to ballistic missiles. As a result, conventionally armed gliders of regional ranges would probably *not* enhance the threat already faced by U.S. forces and U.S. allies in the western Pacific.

In short, the military threat posed by Chinese gliders, should they be deployed, will depend on their range and payload. While regional gliders and nuclear-armed gliders would reinforce the status quo, conventionally armed intercontinental gliders would create a qualitatively new threat. It will, therefore, be important to monitor the program closely to better discern China's objectives.

\* \* \*

To conclude, let me simply observe that this picture of China's nuclear weapons and emerging missile technologies is a complex one. Some developments—such as the possibility that the PLA may be seeking a conventional, intercontinental boost-glide capability—suggest it may want the ability to change the status quo by force. Other developments—such as its efforts to ensure the survivability of its nuclear forces—suggest it is more intent on preserving the status quo. Such contradictory impulses can and do frequently co-exist within governments. A challenge for U.S. policy, it seems to me, is how to convince Beijing that it will not succeed in any attempt to change the status quo by force *and* that the United States will not seek to do so either.

## PANEL II QUESTION AND ANSWER

HEARING CO-CHAIR TOBIN: Thank you all.

In some ways, I didn't mention early on that we have a physicist, we have someone who's controlled the nuclear missiles for a long while, and then we have somebody who is right there talking with the Chinese regularly.

So it's quite a different world that you live in, and thus to you, several of our questions probably will be pretty basic. I'm going to start first with Commissioner Fiedler, if you would.

COMMISSIONER FIEDLER: I'd like to probe a little more on the no-first-use. The no-first-use policy was developed when they didn't have much of a capability; right?

[Panelists nod affirmatively.]

[Laughter.]

COMMISSIONER FIEDLER: So it was essentially meaningless. Now with a greater capability, ambiguity serves them better than does a definitive no-first-use doctrine. So am I right in assuming that the likely policy continuum will be not to talk about no-first-use and just leave it at that? Keep everybody wondering? Is that fair?

DR. TWOMEY: I think that's highly unlikely. I think the next White Paper will almost certainly include repetition of the standard formulation. You've seen it in other statements subsequent to the last White Paper. So in official declaratory policy, I think it's likely to be there.

COMMISSIONER FIEDLER: And then our judgment would be that it is likely a deception?

DR. TWOMEY: That wouldn't be my judgment. I think--

COMMISSIONER FIEDLER: Why?

DR. TWOMEY: --the asterisks and ambiguity that were alluded to earlier are absolutely the case: that is, conventional attack on Chinese nuclear missiles and potentially C2 systems would be regarded as enough of an exception to get them out from whatever commitment they felt they had made, but that the utility of--again, there's not a widely established literature in China on using these things in a coercive manner offensively although there's a lot of other military-related literature out there.

COMMISSIONER FIEDLER: Anybody else have anything?

DR. ACTON: I'd just make two brief points. I actually think China did have a capability to use nuclear weapons in the way that Chris has described, albeit with much less precision, but very early on. I mean if China had felt under deep threat in the very early days, it could have--you know it had the capability for a limited nuclear strike to try and deescalate. So I think at the time no-first-use was first issued or perhaps very shortly afterwards, there was a capability that could have been useful for first use, not a kind of grand splendid first strike but limited use to try to get an adversary to back down. But I think China still chose to say no-first-use in spite of that.

Secondly, I think I'd distinguish here between the political leadership and the PLA. I agree with Chris Twomey that we are likely to see continued high-level repetition of no-first-use, and I think we're likely to see individual PLA officers, as they have done, try to play it down in other fora.

If we were ever in the situation that the use of nuclear weapons was imaginable, who would win in that? Would there be contradictory advice to the political leadership? Who would get their say? I have absolutely no idea. But I wouldn't go so far as to say I think this is some kind of grand bluff or grand attempt to deceive.

COMMISSIONER FIEDLER: Do we have any idea--I'm sorry--you want to answer?

DR. YEAW: Just to add very quickly, I think I would agree that they would not likely walk away from no-first-use. They'll probably reiterate it. The political costs of not reiterating it is a little bit greater than any kind of deterrent benefit that they might gain by leaving it ambiguous, but the real question is do their secret strategic plans--

COMMISSIONER FIEDLER: Right.

DR. YEAW: --accord well with no-first-use? Everyone has a no-first-use hope. It's different than having a no-first-use pledge. And so how strong is the pledge or how firm can we take that? That's the real question. And I think from the doctrinal documents, there are clearly some cases where the PLA

has thought through escalating across the nuclear threshold before the adversary does.

COMMISSIONER FIEDLER: So that raises the question in my mind about--and we haven't, I don't think--I was a little late coming back in, but I don't think we talked about it, which is the decision-making process on pushing buttons. We know what it is roughly in the United States. What is it--since we don't know much about the decision-making process on the Standing Committee on non-threatening decisions, how do we think it works, and we have had a number of instances where serious people in the United States government have proffered the notion, i.e., the ASAT test, that there were rogues in their house.

And the PLA--the role of the PLA and the United States Army or any other democracy's armed forces is quite different in China. So is anybody worried about their decision-making system, especially when it comes to promises and pledges of no-first-use?

DR. TWOMEY: I'm certainly worried about it. The clear statement that this is a national level decision that would be made by the head of the Central Military Commission, which is Xi Jinping, the political leader, has been reiterated a number of times.

I think all of the examples in the stealth fighter as well as previous examples that suggest mismatches between the civilian side and the military side do give us grounds for concern. I think the nuclear issue is one that is unlikely to slip through the cracks in that context, but I think what is more worrisome would be that the nature of advice given to Xi Jinping in an intense conflict would be heavily dominated by the military.

COMMISSIONER FIEDLER: Especially if time is compressed as well as it would be in any nuclear decision-making process.

DR. TWOMEY: As their command and control systems begin to go black in an intense conflict, the degree to which they would understand that was intended as a signal against or use of force against conventional systems, and not nuclear strategic systems, I think is unlikely to be conveyed.

DR. YEAW: Yeah, I think I would completely agree with Chris on this. The nature of the worry is particularly when we execute the type of warfare that the United States has demonstrated over and over again where we take out your eyes, take out your ears, and you don't know what's happening, and now you have generated weapons out in the field with commanders that have some previous commands, but is there a preauthorization? What kind of DEFCON alerting levels do they have?

COMMISSIONER FIEDLER: How do they communicate the codes?

DR. YEAW: Exactly. So these are complicated questions, and the opacity that surrounds all things nuclear, I think, in China doesn't obviously help us in this respect.

COMMISSIONER FIEDLER: So you didn't give me any great confidence in accepting any pledges on no-first-use, no matter what they say. I mean saying things and then having a system that exists that is rife with problems diminishes the value of the pledge it seems to me.

DR. YEAW: Yeah, I'd agree with that statement.

COMMISSIONER FIEDLER: Thank you very much.

HEARING CO-CHAIR TOBIN: Mr. Acton, did you want to respond--okay--to that?

Let me pursue, Mr. Twomey, the fact that you come to us just several weeks after having been in Beijing at a 1.5 Dialogue. I'm not fully aware of exactly how that would work, but are you free to tell us what you're hearing from the Chinese, and I know some of that was in your testimony, and what do you say in such a setting when they bring up the fact that we are modernizing? How do you handle that dialogue? I want to have some sense of how it works; how often are you able to convene with them, and are you seeing any shift and learning anything from the 1.5 Dialogue?

DR. TWOMEY: Yes, I would highlight a couple of things. First, just to kind of lay out the broad format, to give you a sense of who is in the room, we have been able to engage more and more kind of officially on their side over the years to include now the General Staff Department and Second Artillery both in the room where they have long been in the second row, but now at the table and occasionally making presentations.

These aren't the same guys who are pushing the launch code button, but they are people from within that system. We discovered that the Second Artillery has an arms control division or bureau,



which is an important insight because that's a set of people whose expertise we would want to have in that institution and who we would want to empower as best we can so that those discussions can progress.

We have also been able to engage with the scientific community when we're in Beijing, at least to include the equivalent of Livermore and Los Alamos, so the father of their nuclear program, Hu Side, brings a large delegation to the table. So there is both uniformed professional military education folks, foreign ministry folks, and then some analysts on their side, and a similar mix on the U.S. side.

What we've heard over the years I think are germane to exactly some of these issues. There's been an ebb and flow on concern over missile defense that has not tracked necessarily the dollar figures that have gone in, but that have highlighted some issues that we might not have anticipated, in particular with regard to a somewhat quirky interpretation of U.S. theater missile defense systems that does not accord with the way we would usually think about them.

We have talked a lot about these debates over NFU, again, at the political level, that really peaked probably five years ago, and thereafter there was a political decision to not move away from them without fully addressing, I think, some of the points that Commissioner Fiedler raised with regard to C2. So we've been able to kind of see some of those developments. With regard to some of the U.S. programs, there are a range of Americans in the room who are able to articulate, unofficially, U.S. policy on these issues and on both missile defense program development and on strategic nuclear program modernization.

From the Chinese perspective, I'm not sure that all of those answers have been all that reassuring, but I think it's important to understand the nature of those concerns, not that you necessarily react to them, but you at least want to understand the dynamism.

HEARING CO-CHAIR TOBIN: I see. And that's where they question our modernization? Is that what you're referring to?

DR. TWOMEY: Yes. The large amount of money that was put into maintaining nuclear weapons lab infrastructure certainly caught their attention. There is a little bit of a disjoint between their scientific community who understands how expensive some of those things might be, but then their political community and the military leadership themselves who are a little bit disassociated from that. They take the weapons when they're delivered--and I think Mark Stokes provided some good discussion of that this morning--and then goes to think about how to operationalize those capabilities.

But those are very different communities that don't have an awful lot of opportunity to come together. It's a much more stovepiped system than we have, although certainly we have our own shortcomings in that regard.

HEARING CO-CHAIR TOBIN: Thank you.

I have other questions for the others, but let me ask Commissioner Bartholomew, please.

COMMISSIONER BARTHOLOMEW: Thank you, Madam Chair, and thank you for pointing out that we have some nuclear physicists, rocket scientists types, here with us today to give us the benefit of your brilliance.

I'm struggling a little bit with this cognitive dissonance, though, as I look at the terminology as we talk about some of these things. For example, how could there be a deescalatory nuclear strike? And following up on what Jeff said, we have in previous years on this Commission looked a little bit at the Chinese doctrine of offensive defense, which again it's a very interesting and difficult concept to get around, the fact that you could do an offensive action as a defensive action, which I think then raises questions about no-first-use.

So, Dr. Yeaw--is that how you pronounce your name?

DR. YEAW: Yes, ma'am.

COMMISSIONER BARTHOLOMEW: Yeaw. You note on page four of your testimony, you talk about no-first-use, and then on page five, you go on to give some statements from Chinese documents: "When we are under the pressure of circumstances to use military force to reunify the motherland's territory, we may even lower the threshold of using nuclear weapons to deter intervention by external enemies."

So I'm--Dr. Acton, you mentioned that you don't think that no-first-use is a bluff, but I'm not even being able to ask this clearly, but I'm really struggling with this concept that there is a no-first-use

doctrine which is not understandable by me in the context of what no-first-use really is. Help.

DR. YEAW: I would say that their no-first-use pledge is something that they intend to hold to--

COMMISSIONER BARTHOLOMEW: Except for.

DR. YEAW: --unless they can't.

[Laughter.]

DR. YEAW: Right. So they do list some specific scenarios in which they might consider a nuclear response to conventional aggression, and this is extremely high-intensity conventional aggression and generally when the legitimacy of the rule, which I think we heard about before, looked to be in danger. That is the Communist Party may go away as we know it. So under those kind of extreme conditions I think that they would look to first use. I think they--my personal opinion, I speculate they have plans for that on the books. I don't think they want to use them just like most don't want to use nuclear weapons.

But when they do use them, they are likely to use them in a deescalatory fashion, and I know you raised that question. The Russians are fond of talking about deescalatory nuclear strikes. It is difficult to conceive of how an escalation in intensity could deescalate the conflict. But the intent here is to demonstrate to the adversary that the stakes are so high for you that you're willing to cross the nuclear threshold and take this to nuclear war if need be; therefore, the adversary should contemplate deescalating or going to the negotiating table, et cetera. Something on terms more favorable to the one who's trying to deescalate, and usually it's--it could be very early in the conflict.

The Russians have talked about an early deescalation, before the stakes have gotten high. A conflict that starts about rocks in an ocean, once a lot of U.S. sailors, soldiers, and airmen start dying, it's not about the rocks anymore. It's about the sunk costs of our blood and treasure. And so before that happens, and the United States puts all of its chips to the middle of the table, they would seek to deescalate and thereby win without fighting.

DR. ACTON: Commissioner, let me make two points. Firstly, on no-first-use, I think the Chinese political leadership believes it and has tried to squash dissention from the military on that. We've seen that in recent years. In the event that there was ever pressure on China to use nuclear weapons first in conflict, I don't know whether the political leadership would win out above the military. But I would much prefer for China to have a pledge of no-first-use that the political leadership has subscribed to and so to have push-back to using nuclear weapons first than for China to have no pledge and to have agreement within China that it was a good idea to use nuclear weapons first.

COMMISSIONER BARTHOLOMEW: That makes sense.

DR. ACTON: So with all the "ifs" and "buts" and provisos, I do think that the no-first-use pledge is in the United States' interest, and I think allies in Asia would be awfully upset if China were to drop no-first-use.

On deescalatory escalation, it's actually a playbook from NATO strategy during the Cold War. It's not just Russian strategy. It was also our strategy in the Cold War. When NATO was conventionally inferior in Europe, it held out the option to use nuclear weapons first and to use them early in a conflict. And those weapons had two purposes. In a narrow sense, they were to literally destroy the Soviet tank armies coming through the Fulda Gap to win the battle. But in a much bigger sense, it said we're willing to go all the way here: if you, the Soviet Union, keep pushing, we're willing to escalate all of the way up to strategic nuclear warfare, as a way of terrifying the Soviet Union into backing down. And in that sense, it was escalating in order to convince the other side to deescalate.

So it's not that China is both escalating and deescalating simultaneously. It's that China, if it has this policy, and I don't know if it has, but if it has this policy, China is escalating to convince us to deescalate, and that's how I would solve the paradox of deescalatory escalation.

COMMISSIONER BARTHOLOMEW: Thanks.

Dr. Twomey.

DR. TWOMEY: Briefly, I think the Chinese have a difficult strategic situation in some of these cases. They have a grossly inferior nuclear arsenal and so they have serious credibility problems in using nuclear deterrence to prevent further escalation. They're on the losing side of that, and so that forces them

to think about some of the things that I think Chris was just talking about in terms of sending signals that raise questions about the logical validity of them as ways to try to reestablish some credible deterrent.

HEARING CO-CHAIR TOBIN: Commissioner Fiedler is going to jump in on this.

COMMISSIONER FIEDLER: I fully understand it, and I think actually it is--once they understand their vulnerabilities, which are greater, presumably, than ours, that the likelihood of deescalatory nuclear--let's call it tactical nuclear exchange--is greater. Am I right?

I mean the weak are the ones that use this because you just described a scenario--he did--of "we're in an inferior position, the tanks are coming, and so we better--we can't deal--we have to deal with the tanks, but we also want to show them that we're serious so we use a tactical nuke on the tanks."

I think that that is a more likely scenario given their vulnerability and their--vis-a-vis us than anything. Am I off on that? I mean, it's a danger. But it is de--and in other words, they're saying, "wake up." We feel threatened and we're going to do this, and so you better recalculate what you're doing because now the calculation has changed.

DR. YEAU: Commissioner, I would agree with that. If the U.S., for example, were very successful in executing Air-Sea Battle in a contingency over Taiwan, I might expect an early use where the vulnerabilities of the PRC are laid bare to themselves. I might expect an early use of either a demonstration or very ultra-low-yield--I mean ultra-low--casualty--strike, maybe together with a diplomatic statement that said "please poll your population and see what fraction can name one other city on Taiwan besides Taipei."

COMMISSIONER FIEDLER: Right.

DR. YEAU: And the intent there is obvious. This is not a matter of existential survival to you; it is to us.

COMMISSIONER FIEDLER: Yeah.

HEARING CO-CHAIR TOBIN: Commissioner Bartholomew, you had several questions together?

COMMISSIONER BARTHOLOMEW: No, well, again, I guess I walk away from this agreeing that it's better that there is a no-first-use pledge than that there isn't, but that we shouldn't take a whole lot of confidence in the fact that there is one; is maybe the way I'll deal with the cognitive dissonance. I mean some of it is semantics, I understand that.

And then, Senator Talent, I'm barging in on one of the questions he's about to ask, and this is obviously a hypothetical, but if the Chinese, if the Communist Party were to see an existential threat from inside the country, do you think that they would be willing to use a small-scale nuclear weapon internally?

DR. TWOMEY: I think it's hard to imagine them telling themselves a story where that helps move the ball forward to the survival of the Party if it's primarily internal. I think some of the scenarios that Chris is spinning out where the PLA's weakness is laid bare, one can tell a plausible story although I think it's a bit of a challenge even there, but one can at least do so--that seems more reasonable. But internally, it's not the right tool.

COMMISSIONER BARTHOLOMEW: Any dissention on that? No? Okay. Thanks.

HEARING CO-CHAIR TOBIN: Commissioner Talent, go for it.

COMMISSIONER TALENT: Just--it's all been very enlightening, and we've been discussing mostly intentions and how you judge their intentions. So I just want to bring in, I mean I think when you try and figure the intentions of somebody, you look at the range of their conduct. So this is a regime that is systematically oppressing its people. It has, I don't know, millions of people in "black jails." It's committing cultural genocide in Tibet. I mean we can go on and on and on; right?

And it is also engaged in a very substantial conventional military buildup, which the next panel said was--and then it's pretty obvious to everybody--was designed to shift the balance of power so as to be leverage in their regional ambitions, which are aggressive.

So I guess what I'm saying to you is in view of that, looking at a whole range of conduct, and we're trying to judge intentions, would you agree that it's one thing to say that this is a regime that makes rational decisions in terms of how it's defined its objectives, but it's not a regime that you should believe

is going to, is going to abandon a particular course of action that they may think is in their interests because they promised they wouldn't do it?

I mean these are not folks who have scruples along those lines; right? So would you all agree with that? When we're trying to figure out their intentions, what we need to do is to decide, figure out what it is they want to achieve and how they are judging the most rational set of tools as to achieve that?

DR. YEAH: Absolutely. I would completely agree, Senator. They are rational actors in that respect. They are not irrational...so they have a calculation, and the calculation is as you specified. The values that they base their calculation on are not our values. The philosophy of escalation that they use is not our philosophy of escalation. So the factors in the equation have changed, but it's still an equation that they're putting together.

DR. TWOMEY: I would agree. I think I wouldn't have put the--there are certainly areas where U.S. national interests and Chinese national interests are fundamentally at odds. There is no question about that. I don't think there is a pervasive--I don't think that describes the full range of the two sides' national interests even in East Asia, and so I think the scope for conflict is somewhat more limited than that.

Within a crisis, I think, yes, the nature of rationality would be fairly narrowly defined, but I think more broadly if you step back and look over the last 30, 40 years, nuclear weapons have not served as a core tool for them to achieve some of their goals. The conventional modernization has progressed at a pace much more rapid than the nuclear modernization. I think that tells us something. That capability change tells us something about the issue of intentions on nuclear issues as well.

COMMISSIONER TALENT: Yes, please.

DR. ACTON: I'd just say very briefly, Senator, that I think you're absolutely right that the Chinese government will execute a rational cost-benefit analysis over a course of action.

I'd add that I think, I think the Chinese government, on a rational level, views the potential costs of using nuclear weapons as being extremely high --as every state that has contemplated their use in a crisis has viewed those costs.

So I wouldn't assume that nuclear use would be undertaken lightly, and I think that the costs of nuclear use are real and would be factored into a decision calculus of those costs.

COMMISSIONER TALENT: Yeah, I agree with that, and I just, I just, it's a question of what they think advances the goals that they have set for themselves, and I was really following up on what Commissioner Fiedler was saying. In other words, they're perfectly capable of lying about saying that there is no-first-use if they thought that that was advancing their interests.

I tend to agree with you that basically that's not the case here, that they really don't intend to use them, and they figure since they're not intending to use them anyway, they get the political value out of saying that there is no- first-use, but I do think that we need to watch it because if their interests would be advanced in certain circumstances by using them, I think the fact that they pledged not to won't amount to a hill of beans, and that's the point I was making, and I don't think any of you are really disagreeing with that. Okay.

COMMISSIONER FIEDLER: I would just add one other thing to my--for anybody who was here for my early morning scenario, which is that I agree with everything that has been said. The moment of irrationality, if you will, is when they conclude that the Party is finished if it doesn't.

So I'm not talking about global nuclear war. I'm talking about tactical use. Okay. So I could even fit it into the scenario that I talked about this morning, which is they think they can do it quickly, and it turns out they can't. And now he's--the leadership is overextended, it has made its decision, and its legitimacy rests on the outcome--and you could call that rational or irrational depending upon your point of view-- and I'm not talking about, again, I'll reiterate, global nuclear war, just something that shows you, "oh, gee, this is serious, guys, back off," you know, sink a Spratly Island or something, something with no people on it.

To add to Jim's comment, that's where rational and irrational merge, I think, at legitimacy and power. Am I off on something? Yeah?

DR. ACTON: I think the use of nuclear weapons in that way would not be irrational. I think that

would be--

[Laughter.]

COMMISSIONER FIEDLER: That's what bothers me.

DR. ACTON: If you honestly believe that if you don't use nuclear weapons, you'll end up like Saddam or Gaddafi or Milosevic, and if you do use nuclear weapons, you have a chance of not ending up like them, I don't view that as being irrational.

COMMISSIONER FIEDLER: Perfectly rational.

DR. ACTON: And, no, that's actually a point the North Koreans have regularly made in public statements.

COMMISSIONER FIEDLER: Right, right.

HEARING CO-CHAIR TOBIN: Uh-huh.

DR. ACTON: What I would say is I think the policy challenge this poses to the U.S. is how the U.S. can fight a manifestly limited war, conventional war, in which the U.S. will basically say "we're not going after the regime providing you don't use nuclear weapons. If you don't use nuclear weapons, we're not going to go after the regime." I think that learning how to fight a manifestly limited war – to the extent there is an answer to the very real problem you identify – is the only one that I can think of.

COMMISSIONER FIEDLER: I think they'll believe that as much as I believe their no use, no-first-use. I don't think they'll believe our statement about we're not going after the regime. I don't think that's sufficient.

In a perverse sort of way as I'm sitting here listening to this, I almost am close to making an argument that I favor their conventional military modernization being more on an equal basis with the United States. I think you understand why I'm saying that. So that everybody is just like a stasis, and you don't go into these dark corners of rational/irrational, you know; right?

But in the end even that doesn't guard against the domestic fragility of the place, and that in the end--I could argue, by the way, and have that U.S. policy towards China is one-dimensional--and that all we care about really in the end is stability in China, for these very reasons.

HEARING CO-CHAIR TOBIN: Thank you.

Commissioner Shea.

VICE CHAIRMAN SHEA: Sorry I wasn't here for your oral testimony, but I did read your comments, your written testimony, so thank you very much for being here, for making such an important contribution.

Just this question, I have a question about the historical basis of storing the warheads separately from the delivery system, and I'm curious, why does China do that? There must be some interesting historical reason. I was wondering if you could shed some light on that?

And, secondly, if they, when you read the unclassified material, it's about to have a submarine-based nuclear deterrent, on the cusp of, or--I'm not sure whether it's happening or not, but when they do have a submarine-based nuclear deterrent, the warhead and the delivery system will be mated, correct, so what types of issues are implicated by that reality?

DR. TWOMEY: I think historically it is a real insecurity with the command and control provisions that they had in place that wanted separate lines of control over the launch system and the warhead to ensure unauthorized launch was at a lower probability because they don't have a personnel reliability system in the same way that we do. They've relied on that instead, and, in fact, it's even one layer deeper than that. The political commissar system already ensures you have dual commanders at the different unit levels, and so, in a way, you've got almost four people having to go along with that decision for the land-based force today.

Again, although as Chris noted, there's now some discussion in Chinese sources about a small portion being somewhat more ready to launch than others, at least in crisis time.

As to the second part of your question, the submarine force, that's going to force a change that is much more dangerous than our own transition to a submarine force, which wasn't all that smooth or stable to begin with, because they have--because at least we had in place the personnel reliability systems that were required for us to be confident in our land-based force before we moved to a submarine-based force.

So in addition to the normal command and control problems, the hazards of managing the reactor and the ship, which have been problematic for them to date, now they've got to add this newer layer, which is one of the reasons why I think more engagement between the scientific community for things like permissive action links to ensure that they can't be launched until they're ready to be launched would be positive.

VICE CHAIRMAN SHEA: Permissive action links. Explain.

DR. TWOMEY: They prevent the warhead from being launched by a local commander until you've got codes from the national command authority. I should actually let my physicist friends speak in more detail.

DR. YEAW: I think generally I would completely agree with Chris there. The C4 structure for nuclear has been fragile in the past, and so there's this tension between the "always" and the "never." You always want to be able to use them when you want to use them; you never want them used when you don't want to use them. So, and in the past, they have solved that conundrum by keeping them separate because of the lack of confidence in their C4I, and maybe a more robust C4I will give not only them confidence but us confidence that they can control these things well.

As far as permissive action links and authentication of emergency action messages, we are not really very sure how that emergency action message, or whatever they call it, process goes in China, and so when a commander gets an emergency action message, do they have to decode things? They have some sort of a personnel check system. It's not the same as our personnel reliability system.

Even Pakistan has a personnel check system for their strategic forces although we'd say it's not nearly as robust as ours. So there's a number of issues there. Permissive action links probably would come into more play on the land force even where you have to actually enter codes to arm, allow the warhead to arm. I think that--on submarines, it's a little bit, a little bit more challenging.

DR. ACTON: I'd make two brief points. Firstly, I think I agree with the assumption behind your question, that it's likely that China will operate its submarines with missiles mated to warheads. However, until there is positive evidence of that, I wouldn't treat that as an absolute given. I mean China has operated its nuclear force in ways that have surprised the U.S. in the past. So I think we shouldn't assume how the force is going to be operated until we actually see it -- though I agree it's likely.

VICE CHAIRMAN SHEA: Why wouldn't they do that? It would increase survivability, enhance--

DR. ACTON: Well, my assumption that they will mate warheads is because of the decrease in survivability if they don't. But perhaps the argument that Chris Twomey lays out, that they want more control... de-mating is a way of ensuring checks and balances conceivably could win out, though I think it's not all that likely.

If China does sail its submarines with warheads mated to missiles, there are some fascinating choices that it faces. My understanding is that the U.S. has always assumed that it is impossible that the entire U.S. would be wiped out to the point that it could not get an order to a submarine.

Other nuclear weapon states such as the UK have made a different decision. In the UK, my understanding is that the commanders on the submarine have the ability to launch a nuclear weapon in the event they are convinced that the UK is completely destroyed, and there is a safe in the submarine with sealed orders from the Prime Minister. It's kind of charming.

[Laughter.]

VICE CHAIRMAN SHEA: Right.

DR. ACTON: Do we know which one of those is China going to go down? One might think because China is a huge country, it's not going to worry that its leadership is going to be completely wiped out.

On the other hand, the Chinese leadership does appear to have genuine and deep concerns about vulnerability. So I think this is potentially going to be a huge shakeup for Chinese forces' command and control. If the Navy does mate warheads, does that then become a precedent that the Second Artillery cites to do the same with the land-based missiles? I mean there's a lot of questions here and very few answers.

VICE CHAIRMAN SHEA: "You trust them, but you don't trust us?" That sort of--it would be a talking point--

DR. ACTON: Exactly. Exactly.

VICE CHAIRMAN SHEA: --for the Second--right. Thank you very much.

HEARING CO-CHAIR TOBIN: Commissioner Fiedler, I have you down for one more question. Or did you get it in in the last?

COMMISSIONER FIEDLER: I think I got it in in one of my interruptions.

HEARING CO-CHAIR TOBIN: Okay. Let me just say Commissioner Bartholomew, I'm so glad you said what you did about the fact it's hard to really understand things when the words' meanings suggest the opposite. That's exactly what I was thinking. Mr. Yeaw, it almost seems that everything about the situation is a kabuki dance, and their kabuki is different than ours. Several of you spoke about the philosophy of escalation being different.

So let me ask a clarifying question of Mr. Acton, and then a question for all three of you in terms of our recommendations. Mr. Acton, did I hear it correct when you said the hypersonic glide vehicle, which we know, we've been briefed, can carry the conventional missiles and the nuclear missiles, and then you said if it carried the nuclear missile, it would keep things stabilized-- Now to me that would escalate things. So can you help with that?

DR. ACTON: My first position is I have no idea whether the hypersonic glide vehicle is designed to carry nuclear warheads or conventional warheads. I think it's possible the PLA has a clear idea about why it wants this. It's possible it's currently a technology development program, and I'm not making any claims about what it is or isn't armed with.

The challenge for conventional warheads is accuracy. Developing a hypersonic glide vehicle is difficult. Development of hypersonic glide vehicle that can hit a target within a few meters, which is the accuracy required to deliver conventional weapons, is even more difficult.

HEARING CO-CHAIR TOBIN: Uh-huh.

DR. ACTON: So crudely, and there's various "ifs" and "buts," I could add to this statement, but if the system is capable of carrying conventional warheads, it's also capable of carrying nuclear warheads. If it's capable of carrying nuclear warheads, it's not necessarily capable of carrying conventional warheads.

And I wouldn't exclude the possible--

HEARING CO-CHAIR TOBIN: I see.

DR. ACTON: There's four possibilities, none of which I would exclude: that China never deploys one of these systems; that China deploys it in a conventional variant; that China deploys it in a nuclear variant; or that China deploys both. And all four of those are possibilities--and I make no prediction as to which one we're likely to see.

In terms of why I said that the nuclear one--I think the phrase I used was maintain the status quo.

HEARING CO-CHAIR TOBIN: Yes, you did.

DR. ACTON: And that's because I believe that China already has the ability for its nuclear warheads to penetrate the U.S., to survive a U.S. first strike, which I think is not going to happen. But, hypothetically, if the U.S. were to do a first strike on China, I believe that China would have nuclear warheads surviving that could penetrate U.S. missile defenses and inflict nuclear damage on the United States and its allies. That I believe is the status quo: that mutual vulnerability is not a policy choice; it's a reality that we face.

China, however--there are clearly thinkers in the PLA who worry that that won't be maintained in the future and they worry about advanced U.S. missile defenses. So hypersonic glide vehicles, which are particularly effective at penetrating area missile defenses but may not be very good at penetrating point defenses, the hypersonic glide vehicles would continue--would give China the continued ability to penetrate U.S. missile defenses, and that's why--

HEARING CO-CHAIR TOBIN: I see.

DR. ACTON: --I said they would maintain the status quo.

HEARING CO-CHAIR TOBIN: Yes. Yes. Jump in.

COMMISSIONER FIEDLER: No, no, no.

HEARING CO-CHAIR TOBIN: Okay. Thank you very much, Mr. Acton.

The other question that I want to ask, and drawing on your respective areas of expertise, Mr. Twomey, from your Strategic Dialogue presence over time, Mr. Yeaw, from your being right there managing the missiles, Mr. Acton, from your expertise as well, would you tell us--we prepare recommendations to Congress, what recommendations would you suggest we make, given where you sit. They could involve the State Department or the Defense Department.

So what, given your knowledge and expertise, would you like to see done by our Congress or the executive branch?

DR. TWOMEY: I would highlight a couple of the areas that I mentioned earlier, which is that I think the lab-to-lab channel that is somewhat restricted under NDAA 2000 with regard to the U.S.-China relationship would be a productive area to have some of these conversations.

We don't want to ensure that the Chinese warheads are always available when they want to use them, but we certainly want to ensure that they are not available when they don't want to use them. Half of the always/never problem. Nuclear security, in general, I think would be an area that the lab-to-lab channel is the best way to move forward on.

I think some other areas like Congress asking DoD to study whether conventional weapons can adequately target Chinese tunnels when we know Chinese tunnels are an area where they might defend their--store their nuclear weapons is an area that sends exactly the wrong signal to the Chinese and forces them to think more about that asterisk on the NFU for, well, "if we get hit with conventional, then we're free to respond in kind."

And then, lastly, we need to think carefully about balancing our missile defense needs with regard to lesser adversaries against what may--what capabilities it may project from the Chinese perspective with regard to theirs, and some of that is official diplomatic discussions on those, and I would certainly involve State Department and DoD in these discussions, and they would welcome an opportunity I think to continue moving further in that direction; but it's a very challenging issue because while national missile defense is not aimed at China--according to, again, decades of policy--theater missile defense certainly is for the conventional reasons you heard about in the morning panel.

HEARING CO-CHAIR TOBIN: Uh-huh.

COMMISSIONER BARTHOLOMEW: Could I just get a clarification, Dr. Twomey, that what you just said about DoD reporting about our ability to do the tunnel, to hit the tunnels if we need to, do you think that that's a bad idea or a good idea?

DR. TWOMEY: I generally think firewalls between nuclear conflict and conventional conflict are good.

COMMISSIONER BARTHOLOMEW: So you think that we, that DoD should be reporting to Congress?

DR. TWOMEY: I think "should not" because that blurs the line. I think once we start talking and thinking more about how we're going to take away Chinese nuclear options using conventional forces, that suggests that we don't see much of a delineation between those two, and I'd put global thermo-nuclear war in a rather different category than even an intense conventional conflict.

COMMISSIONER BARTHOLOMEW: But I guess my concern on that is that without some sort of reporting, how does Congress know that DoD is, indeed, concerned about these tunnels and what they might be being used for and has some sort of plan?

DR. TWOMEY: I think one can be concerned about the tunnels, which we I think have pretty clear evidence the Second Artillery is involved in in some of them, and tunneling is not a new thing for the Chinese. It goes back to the third defense line in the dark days of the Cold War against the Soviet Union.

But I think there's clear contemporary evidence that the Second Artillery is involved there, and I think one can presume that the nuclear weapons would be the most protected. So, again, there's a conception that if you want to draw the line between nuclear war and conventional war with a relatively bright line, I think it's one of the few escalatory lines that is so bright, which is why we spend all these



discussions about the subtle ways that the Chinese might manipulate that. I don't want to make that any easier for them.

VICE CHAIRMAN SHEA: Do you know why DoD has not provided an unclassified estimate of China's nuclear warheads since 2006? Is this because they don't want to blur the line in that document or?

DR. TWOMEY: I'm sorry. They have--the Pentagon report the last two years, the Pentagon report on Chinese military power has for the last two years not presented numbers on ICBMs, but prior to that, it did.

VICE CHAIRMAN SHEA: Nuclear warhead stockpile as opposed to missile.

DR. TWOMEY: Yeah, stockpile. No, I don't speak for DoD.

VICE CHAIRMAN SHEA: No, but do you have any reason why they don't?

DR. TWOMEY: No, but I think you've had a variety of testimony in front of Congress and I believe in front of this Commission speaking in broad parameters about the arsenal size in ways that are consistent with the numbers that we've thrown around today.

VICE CHAIRMAN SHEA: Thank you.

HEARING CO-CHAIR TOBIN: And thank you, Mr. Twomey.

And then given the fact that you oversaw so much of what we're talking about in terms of the weaponry, what would that suggest to you we need to recommend?

DR. YEAW: Thank you, Commissioner.

I think first and foremost, we've been on a bit of a vacation in nuclear thought for a long time, maybe 20, 25 years. Since the end of the Cold War, we haven't had to think about crossing nuclear thresholds.

HEARING CO-CHAIR TOBIN: Yes.

DR. YEAW: Deescalating--escalating to deescalate. So when we hear things like that, we forget that, oh, that's right, we actually had that theory in NATO, and so going back to our roots, building the intellectual capital that's required, particularly for DoD, but also for State Department, for our intelligence services.

Most intelligence analysts, as this Commission I'm sure knows, are fairly young. They come out of college. They don't have a lot of experience in real world policymaking. They need to be taught some of these things. So, and, in fact, that's one of the reasons why we just founded the nonprofit CADENSE that we did.

So focused intellectual thought, I think--education of the U.S. government. Looking at escalation research, that's another area where we have kind of stopped looking for a long time. In war games that we play, Title 10 war games, we'll go to the point of nuclear use and then the war game is over because we can't learn anything new after that, right? That's not right. We can learn plenty new, and I think a push to continue beyond that nuclear initiation is important.

Looking at scenarios that could involve crossing the nuclear threshold and then looking at what are the options for us (a) to deter that and (b) to respond in order to deter the next one? So those kind of escalation research--

HEARING CO-CHAIR TOBIN: Yes, yes.

DR. YEAW: --questions are important. So I think going after those would be vital to U.S. national security, and then looking at more broadly at things like transparency. How do we open up creative solutions to open up the Chinese nuclear world essentially with a little bit more transparency? Western scholars probably shouldn't be at the point right now of debating whether there's an even a direct attack gravity weapon in the Chinese nuclear arsenal. I mean that should be an easy answer; right? It's not. We debate it constantly.

So looking at that, and then looking at potential damage limitation capabilities and options that the U.S. has going forward.

HEARING CO-CHAIR TOBIN: Before I hear from you, Mr. Acton, what you just said, Mr. Yeaw, reminds me of what I said earlier this morning to our witness Mr. Gormley. I'm so glad he's teaching because there is a generation that does need to better understand.

DR. YEAW: Absolutely.

HEARING CO-CHAIR TOBIN: So Mr. Acton?

DR. ACTON: A couple of thoughts, and it's one of these areas where it's really hard to make progress because, as much as I very firmly support Chris Twomey's call for greater cooperation, including on a lab-to-lab level, it's sometimes difficult because the Chinese often give the impression they don't want to be reassured.

I mean it takes two states to have a dialogue, and there are barriers in this country, and there are barriers in China. I think the first thing to say is –and I'm going to give some ideas for what we can do cooperatively – but I am cognizant of the challenges of getting a dialogue started, and that those challenges are not entirely in U.S. hands to control or even perhaps primarily in U.S. hands to control.

I think in terms of if there are--

HEARING CO-CHAIR TOBIN: Along the line of it takes two to dance; right?

DR. ACTON: Exactly, right.

HEARING CO-CHAIR TOBIN: Okay.

DR. ACTON: And in terms of cooperative measures, I think we are witnessing the opening salvos of an arms race in hypersonic technology between the United States, Russia and China. All three states now have demonstrated programs in that field, and I think this is potentially dangerous and destabilizing, and I think that there is room for cooperative confidence-building between the three countries.

Just to give you one example, what the U.S. says Russia and China should worry about--the fact that they might mistake a U.S. conventional weapon as being nuclear--is not what Russia and China worry about, which is much more the survivability of their forces. So we all agree that there are risks here. But, we can't agree that those--

HEARING CO-CHAIR TOBIN: Yeah.

DR. ACTON: We can't agree what those risks are. So both in terms of understanding the nature of the risks – trying to come to some kind of shared perception – and eventually develop confidence building, I think that's an area that I would push cooperatively.

Recognizing the challenges of cooperation--I think there are steps the U.S. can take, and this actually kind of chimes with what Chris Yeaw was saying, in terms of building understanding of escalation risks at the level of procurement and war planning. I would love, for instance, for there to be a Red Team in DoD who were experts in Chinese escalation philosophy, to the extent we understand it, and would analyze the potential nuclear escalation implications of procurement and war planning.

My sense is that there is something of an air gap at the moment between PACOM that does the conventional planning, and if you say to PACOM, "what are the nuclear escalation risks," they say "that ain't our problem, go to Omaha." It's kind of dangerous that the people that do the nuclear stuff and the people that do the conventional stuff don't necessarily interact with one another.

HEARING CO-CHAIR TOBIN: Wow. Yeah.

DR. ACTON: And I think this kind of Red Team analysis, what kinds of ballistic missile defense systems are more or less stabilizing – the debate is not missile defense or not, it's what's more or less stabilizing – what kind of high precision conventional weapons are more or less stabilizing? What ways of using force in a conflict are more or less stabilizing?

I don't know the answers to that, but I think it would be very useful for heavy Red Teaming of conventional war plans and procurement for the nuclear implications.

HEARING CO-CHAIR TOBIN: Thank you.

Any final questions, commissioners? No?

COMMISSIONER FIEDLER: Not that can be done quickly.

[Laughter.]

HEARING CO-CHAIR TOBIN: No more questions, thank you. Thank you very, very much. I'm sure you all saw the recent Economist issue so I'm glad we're not alone in trying to track this issue, and thank you--continued best wishes for the Dialogue. Stay in touch with our staff because we will be working hard over the next four months or so distilling this information and putting it forth to Congress. Thank you.

VICE CHAIRMAN SHEA: Thank you.

HEARING CO-CHAIR TOBIN: Session adjourned.

VICE CHAIRMAN SHEA: Till 1:25.

HEARING CO-CHAIR TOBIN: 1:25 we'll reconvene.

[Whereupon, at 12:23 p.m., the hearing recessed, to reconvene at 1:25 p.m., this same day.]

### **PANEL III INTRODUCTION BY VICE-CHAIRMAN DENNIS C. SHEA**

VICE CHAIRMAN SHEA: Good afternoon, everyone. We will now reconvene. Today's final panel will examine the implications for the United States of the steps China has taken to modernize and expand its missile forces, both conventional and nuclear. Our three panelists will assess what risks are posed by these changes, how they can best be addressed, and what policies to pursue going forward.

Our first witness is Robert Haddick, an independent contractor with U.S. Special Operations Command. A former Marine Corps officer, Mr. Haddick has worked in overseas investment in the private sector, as managing editor for Small Wars Journal, and as a weekly columnist for Foreign Policy Magazine, and has been widely published on security issues.

His recent book, *Fire on the Water: China, America and the Future of the Pacific*--I'm trying to boost Amazon.com sales here--published in 2014, addressed the risks posed by China's military modernization. By the way, it's a really fine book so thank you for being here.

Our second witness is Evan Montgomery, who is a Senior Fellow at Center for Strategic and Budgetary Assessments here in Washington, D.C., where his research focuses on U.S. military strategy and adaptability, and nuclear policy and proliferation.

He is a member of the International Institute for Strategic Studies and has also published articles in numerous leading journals and other media outlets. So welcome, Evan, and thank you for being here.

Finally, Bridge Colby is the Robert M. Gates Fellow at the Center for New American Security, where he focuses on strategic, deterrence and nuclear policy issues. Prior to working at CNAS, he was principal analyst and division lead for global strategic affairs at the Center for Naval Analyses.

Mr. Colby has also consulted with a variety of U.S. government entities and authored numerous writings on defense and foreign policy matters.

Again, thanks, thanks for joining us, and thanks for your written testimony, which was very enlightening. As is our way, we ask that you keep your oral remarks to seven minutes, but anyone who has been following us this morning knows that we don't rigidly abide by that rule, at least for this hearing, but let's try to keep it within that range.

And Mr. Haddick, we will start with you.

**OPENING STATEMENT OF ROBERT HADDICK  
INDEPENDENT CONTRACTOR, U.S. SPECIAL OPERATIONS COMMAND**

MR. HADDICK: Vice Chairman Shea, Commissioner Tobin, and Commissioners of the China Commission, it's a great honor to be here this afternoon to discuss China's offensive missile forces and the implications for U.S. strategy and interests in the Asia-Pacific region.

I must first state that the analysis in my oral and written testimony are my personal conclusions and do not necessarily represent those of U.S. Special Operations Command or the U.S. government.

The United States has employed a forward presence strategy in East Asia for seven decades. The security provided by the strategy since World War II has prevented another major power war. America's forward presence during this era has also set the conditions for the region's rapid economic, political, and social development.

Since World War II, the foreign policy of the United States under all presidents has sought to promote economic prosperity, representative government, improving human rights, expanding freedom, and social progress. No region has experienced more success on these measures over the past seven decades than has East Asia. America's security and diplomatic presence in the region has been a major factor in this success.

China's rapid military modernization is raising the cost of sustaining this forward presence strategy. Even so, there is no alternative to America's forward presence. In my judgment, the region would unlikely find a stable balance of power on its own, just as Europe was unable to adjust to Imperial Germany's rapid and disruptive rise in the decades leading up to World War I.

The region is too important to America's standard of living and its role as a leading global power to take that risk. The challenge U.S. policymakers and military planners now face is designing a strategy that will maintain forward presence in a sustainable manner when the costs and risks of that approach will inevitably rise due to China's reemergence as a great power.

Since the end of World War II, operational concepts and plans for U.S. military forces in the Asia-Pacific theater have assumed that the U.S. would have secure forward bases on the periphery of Eurasia from which to operate and that U.S. military logistics operations would nearly always have unimpeded access to this archipelago of bases.

With these assumptions settled, and indeed supported, by actual experience up to the present, U.S. military investments have increasingly focused on firepower platforms with relatively short range: for the Air Force, tactical fighter bombers; for the Navy, aircraft carrier strike groups; and for the ground forces, an assumption that they would have secure ports of embarkation and large bases close to their missions in Eurasia.

China's large-scale and highly successful exploitation of the precision missile and sensor revolution is quickly undermining these central assumptions underlying the fundamental design of U.S. military forces.

Offensive missile forces, which include land-attack and anti-ship missiles deployed on land, aircraft, surface warships, and submarines, now enjoy an era of technical dominance. Fixed forward bases in the region are increasingly at risk, as are U.S. surface naval forces and aircraft carrier strike groups.

We can see that by next decade China's cruise missile-armed Flanker strike-fighter regiments, the mobile theater-range missiles in the PLA's Second Artillery Force, and China's submarine fleet will increasingly hold at risk U.S. bases and surface warships out to about 2,000 kilometers from China's coast.

China's buildup of its missile forces, combined with the increasing vulnerability of U.S. military's short-range forward-based forces, creates an increasingly unstable military situation in East Asia. U.S. military planners believe that China's conventional missile doctrine is based on deception, surprise, and mass strikes on an adversary's perceived centers of gravity, such as command systems and bases.

With ballistic missile flight times so short, U.S. commanders in the theater may increasingly believe themselves to be in a "use it or lose it" situation. This only increases the incentive for both sides

to strike first during a potential crisis, an obviously worrying trend.

Fortunately, there are reforms U.S. policymakers and military planners can make to the Defense Department's procurement plans and operational concepts that can do much to mitigate the emerging threat posed by China's offensive missile forces and thus maintain and bolster deterrence and stability in the region.

For example, the United States should greatly increase its investment in long-range platforms that are based outside the range of China's main missile forces and that are stealthy enough to operate at will inside China's defenses.

U.S. platforms that meet these conditions include the new Long Range Strike Bomber and U.S. attack and guided missile submarines armed with land-attack missiles. When acquired in sufficient quantities, such platforms would be able to hold at risk assets and conditions highly valued by China's leaders.

Doing so would create doubts about the efficacy of China's military options, thus enhancing deterrence and stability.

U.S. officials should continue to engage their Chinese counterparts on the full range of strategic issues with the goal of making progress on confidence-building measures and reassurance. In the meantime, the U.S. government should accelerate the modernization of its military forces and operational concepts and expand diplomacy with its partners in the region.

Continuing engagement with China, accelerated military modernization, and stepped-up diplomatic action with regional partners are complementary activities and should be part of a comprehensive strategy for the region.

A well-designed and competently executed U.S. strategy for the Asia-Pacific region will create affordable and sustainable leverage with an aim to influence China's behavior in favorable ways during an open-ended peacetime security competition. The result from that will be increased deterrence, enhanced regional stability, and the conditions for continued prosperity that will benefit all, including China.

Achieving this outcome will require imaginative and sustained commitment by future generations of America's policymakers. That is the challenge these leaders face but one that promises great benefits for the United States and the region.

That concludes my testimony. Thank you for your attention, and I look forward to your questions.

**PREPARED STATEMENT OF ROBERT HADDICK  
INDEPENDENT CONTRACTOR, U.S. SPECIAL OPERATIONS COMMAND**

April 1, 2015

China's Offensive Missile Forces: Implications for the United States

Robert Haddick  
Independent Contractor, U.S. Special Operations Command

Testimony before the U.S.-China Economic and Security Review Commission

The United States has employed a forward presence strategy in East Asia for seven decades. The security provided since World War II by the presence of U.S. military power in the region has prevented another major power war. America's forward presence during this era has also set the conditions for the region's rapid economic, political, and social development. Since World War II, the foreign policy of the United States under all presidents has sought to promote economic prosperity, representative government, improving human rights, expanding freedom, and social progress. No region has experienced more success on these measures over the past seven decades than has East Asia. America's security and diplomatic presence in the region has been a major factor in this success.

China's rapid military modernization is raising the cost of sustaining this forward presence strategy. Even so, there is no alternative to America's forward presence. In my judgment, the region would unlikely find a stable balance of power on its own, just as Europe was unable to adjust to Imperial Germany's rapid and disruptive rise in the decades leading up to World War I. The region is too important to America's standard of living and its role as the leading global power to take that risk. The challenge U.S. policymakers and planners now face is designing a strategy that will maintain forward presence in a sustainable manner when the costs and risks of that approach will inevitably rise due to China's reemergence as a great power.

### **Security Risk Assessment**

Since the end of World War II, operational concepts and plans for U.S. military forces in the Asia-Pacific theater have assumed that the U.S. would have secure forward bases on the periphery of Eurasia from which to operate and that U.S. military logistics operations would nearly always have unimpeded access to this archipelago of bases. With these assumptions settled and indeed supported by actual experience up to the present, U.S. military investments have increasingly focused on firepower platforms with relatively short range: for the Air Force, tactical fighter-bombers; for the Navy, aircraft carrier strike groups; and for the ground forces, an assumption that they would have secure ports of embarkation and large bases close to their missions in Eurasia. China's large-scale and highly successful exploitation of the precision missile and sensor revolution is quickly undermining these central assumptions underlying the fundamental design of U.S. military forces. Offensive missile forces -- which include land-attack and anti-ship missiles deployed on land, aircraft, surface warships, and submarines -- now enjoy an era of technical dominance. Fixed forward bases in the region are increasingly at risk, as are U.S. surface naval forces and aircraft carrier strike groups.

China's military forces currently suffer from significant shortfalls in command relationships, joint operational experience, training, personnel quality, and other problems, limitations well known to

People's Liberation Army (PLA) officers.<sup>105</sup> However, the PLA has dramatically improved its capabilities and capacities over the past two decades. U.S. policymakers and military planners should expect these trends to continue. As that happens, the question will turn to whether China's leaders in 2020 and beyond might perceive that they will possess military options during potential future crises in the Asia-Pacific region involving the security of Taiwan, U.S. allies and partners, or other critical U.S. interests. Such a change in escalatory perceptions could foreshadow a breakdown in the deterrence provided by U.S. military power, with destabilizing consequences for the region.

## Regional Net Assessment

One of China's most significant and enduring competitive advantages is its continental position. China can project its airpower over the Western Pacific from dozens of hardened bases on and near its coast.<sup>106</sup> These bases are protected by what the U.S. Department of Defense terms "one of the largest forces of advanced [surface to air missile] systems in the world."<sup>107</sup>

China has made a substantial investment in variants of the Su-27/30 Flanker strike fighter, roughly equivalent to the U.S. Air Force F-15E Strike Eagle. China's Flanker variants possess a combat radius of 1,500 kilometers,<sup>108</sup> exceeding the approximately 1,100-kilometer unrefueled combat radius of the U.S. Navy's F-35C and F/A-18 E/F strike-fighters.<sup>109</sup> China has produced the J-11B, an indigenous version of the Flanker, with more advanced indigenous Flanker variants under development. The PLA's inventory of Flanker variants could number over 400 aircraft by next decade.<sup>110</sup> China's Flankers and other strike aircraft (in 2014 the U.S. Defense Department estimated China's total air defense and strike aircraft inventory at 2,100 aircraft) will be armed with a variety of land-attack and anti-ship cruise missiles, some with supersonic speed and ranges up to 400 kilometers.<sup>111</sup> By the end of this decade China is expected to begin forming squadrons of the J-20 strike-fighter, a stealthy aircraft with a possible combat radius of up to 2,000 kilometers.<sup>112</sup>

According to the U.S. Department of Defense, China possesses up to 1,800 theater-range land-based ballistic and cruise missiles, most of which are mounted on road-mobile transporter-erector-launchers and are thus capable of hiding and relocating in China's complex terrain.<sup>113</sup> The revolution in missile and

<sup>105</sup> Michael S. Chase, Jeffrey Engstrom, Tai Ming Cheung, Kristen A. Gunness, Scott Warren Harold, Susan Puska, and Samuel K. Berkowitz, *China's Incomplete Military Transformation: Assessing the Weaknesses of the People's Liberation Army*, (Santa Monica, CA: RAND Corporation, 2015), <http://www.uscc.gov/Research/china%E2%80%99s-incomplete-military-transformation-assessing-weaknesses-people%E2%80%99s-liberation-army>.

<sup>106</sup> Eric Stephen Gons, "Access Challenges and Implications for Airpower in the Western Pacific," (PhD dissertation, Pardee RAND Graduate School, 2010), 217, [http://www.rand.org/pubs/rgs\\_dissertations/RGSD267.html](http://www.rand.org/pubs/rgs_dissertations/RGSD267.html).

<sup>107</sup> U.S. Department of Defense, "Annual Report to Congress: Military and Security Developments Involving the People's Republic of China 2013," May 2013, 8, [http://www.defense.gov/pubs/pdfs/2013\\_CMPR\\_Final.pdf](http://www.defense.gov/pubs/pdfs/2013_CMPR_Final.pdf).

<sup>108</sup> J-11 [Su-27 FLANKER] Su-27UBK / Su-30MKK/ Su-30MK2," GlobalSecurity.org, <http://www.globalsecurity.org/military/world/china/j-11.htm>.

<sup>109</sup> See "F-35C Carrier Variant," Lockheed Martin F-35C Fact Sheet, <http://www.lockheedmartin.com/us/products/f35/f-35c-carrier-variant.html>. "F/A-18 Hornet Strike Fighter," U.S. Navy Fact File, [http://www.navy.mil/navydata/fact\\_display.asp?cid=1100&tid=1200&ct=1](http://www.navy.mil/navydata/fact_display.asp?cid=1100&tid=1200&ct=1).

<sup>110</sup> Gons, "Access Challenges and Implications for Airpower in the Western Pacific," 85.

<sup>111</sup> U.S. Department of Defense, "Annual Report to Congress: Military and Security Developments Involving the People's Republic of China 2014," May 2014, 78, [http://www.defense.gov/pubs/pdfs/2014\\_CMPR\\_Final.pdf](http://www.defense.gov/pubs/pdfs/2014_CMPR_Final.pdf). Vitaliy O. Pradun, "From Bottle Rockets to Lightning Bolts: China's Missile Revolution and PLA Strategy against US Military Intervention," *Naval War College Review*, Spring 2011, 12-4, <http://www.usnwc.edu/getattachment/23a01071-5dac-433a-8452-09c542163ae8/From-Bottle-Rockets-to-Lightning-Bolts--China-s-Mi>.

<sup>112</sup> "2012 Report to Congress of the US-China Economic and Security Review Commission," November 2012, 129, [http://www.uscc.gov/annual\\_report/2012/2012-Report-to-Congress.pdf](http://www.uscc.gov/annual_report/2012/2012-Report-to-Congress.pdf).

<sup>113</sup> U.S. Department of Defense, "Annual Report to Congress: Military and Security Developments Involving the People's Republic of China 2012," May 2012, 29, [http://www.defense.gov/pubs/pdfs/2012\\_CMPR\\_Final.pdf](http://www.defense.gov/pubs/pdfs/2012_CMPR_Final.pdf).



sensor technology has greatly increased the accuracy of ballistic and cruise missiles and lowered the relative cost of these munitions. Finally, China is assembling a multi-dimensional sensor, command, and communications network that by next decade should allow it to effectively employ the platforms and munitions in its inventory.<sup>114</sup> It should be unsurprising that China is exploiting its continental position and the missile and sensor revolution to craft a cost-imposing strategy on the United States in the Western Pacific.

In contrast to China's continental position and its wide-ranging missile forces, the United States faces the burden of operating largely as an expeditionary power, which increases its costs and thus makes it harder to compete with the expansion of China's forces. Further, the 1987 Intermediate Nuclear Forces treaty prohibits the United States from matching China's comparatively economical land-based theater missile strategy.

The U.S. Air Force operates from just six main bases in the theater. The U.S.-China Economic and Security Review Commission concluded that five of these bases (located in Japan and South Korea) are highly vulnerable to suppression by China's missiles.<sup>115</sup> U.S. Navy and Marine Corps naval and air bases in Japan (Yokosuka, Sasebo, Iwakuni, Atsugi, and other facilities) are similarly vulnerable to attack.<sup>116</sup> Although at a farther distance from Chinese land-based forces, the growing complex of bases on Guam will become increasingly vulnerable to suppression as China's land-attack missiles spread to more platforms (such as China's growing fleet of nuclear attack submarines) and increase in range and numbers.<sup>117</sup>

There is increasing concern that U.S. surface warships, including aircraft carrier strike groups, will become vulnerable to multi-axis saturation cruise missile attacks, an operation we should assume Chinese strike-fighter regiments and perhaps its submarines will be able to execute before the end of this decade. In addition, the recent debate over whether the U.S. Navy should require the future Unmanned Carrier-Launched Surveillance and Strike aircraft (UCLASS) to be able to autonomously search for and attack targets at very long range in defended airspace is an acknowledgment that the Navy's carrier strike groups will soon not be able to safely conduct persistent operations inside adversary missile threat zones.<sup>118</sup>

Thus we can see that by next decade China's cruise missile-armed Flanker regiments, the mobile theater-range missiles in the PLA's Second Artillery Corps, and China's submarines fleet will increasingly hold at risk U.S. bases and surface ships out to about 2,000 kilometers from China's coast.

With these capabilities in place by the early 2020s, we can foresee the next expansion in the range of China's access denial capability that may begin to emerge past 2025. Beginning at the end of this decade, the U.S. Department of Defense expects China to begin fielding the J-20 strike-fighter, a stealthy fighter-bomber with a combat radius this Commission estimated at about 2,000 kilometers. Given the advancements we have already witnessed with China's missile programs, the large J-20 could be armed with a smart, precision air-to-surface missile with a range up to 1,000 kilometers, similar to the U.S. Air Force's JASSM-ER missile. That combination would give China a precision strike capability out to 3,000

<sup>114</sup> Pradun, "From Bottle Rockets to Lightening Bolts," 17-8.

<sup>115</sup> "2010 Report to Congress of the U.S.-China Economic and Security Review Commission," November 2010, 89-90, [http://www.uscc.gov/annual\\_report/2010/annual\\_report\\_full\\_10.pdf](http://www.uscc.gov/annual_report/2010/annual_report_full_10.pdf). See also Gons, "Access Challenges and Implications for Airpower in the Western Pacific," 70-80.

<sup>116</sup> Toshi Yoshihara, "Japanese Bases and Chinese Missiles," *Rebalancing U.S. Forces: Basing and Forward Presence in the Asia-Pacific*, Carnes Lord and Andrew S. Erickson, editors, (Annapolis, MD: Naval Institute Press, 2014), 38-9.

<sup>117</sup> Andrew S. Erickson and Justin D. Mikolay, "Guam and American Security in the Pacific," *Rebalancing U.S. Forces: Basing and Forward Presence in the Asia-Pacific*, Carnes Lord and Andrew S. Erickson, editors, (Annapolis, MD: Naval Institute Press, 2014), 27-9.

<sup>118</sup> "HASC Seapower and Power Projection Forces Sub-committee: UCLASS Hearing," Information Dissemination Blog, July 16, 2014, <http://www.informationdissemination.net/2014/07/hasc-seapower-and-projection-forces-sub.html>.

kilometers.

China's development of an anti-ship ballistic missile has received much attention in recent years. Should China master the technology of mating a guided and maneuvering warhead on its 1,500 kilometer medium-range ballistic missile, it would be reasonable to forecast the mating of this warhead to an intermediate-range ballistic missile, with a range exceeding 3,500 kilometers.

These systems will only be useful to the extent that China develops the sensors, long range communication networks, command relationships, doctrine, training, and personnel to effectively employ these potential capabilities. Questions remain about whether the PLA will be able to remedy these known gaps. However, as mentioned above, Chinese military leaders are aware of these shortcomings and are applying additional resources to remedy these problems. Absent a concerted effort on their part to counteract these trends, U.S. policymakers and military planners should expect the vulnerability of U.S. forward-deployed forces in the region to increase over the next ten years and beyond. This would increase the risk of miscalculation during potential crises with harmful consequences for U.S. and allied interests.

### **Mitigating China's Conventional Missile Capabilities**

The single most important policy the United States should pursue to mitigate the growing conventional missile threat in East Asia would be to diversify the U.S. force structure away from the current heavy investment in relatively short range tactical platforms and weapons toward systems with much longer ranges and stealthy characteristics.

For example, the U.S. Navy is moving forward on plans to bolster the air and missile defenses of its surface ships.<sup>119</sup> But the economics of the missile and sensor revolution will continue to favor China's investment in offensive missiles; it will be cheaper for China to add more Flankers, J-20s, and cheap but smart missiles than it will be for the Navy to add additional ships, radars, and defensive missiles. In the longer-run, many are hoping that ship-mounted directed energy weapons will be able to swing the advantage back to missile defense. But according to the Congressional Research Service, reliably defending against high-end supersonic cruise missiles will require megawatt-class free-electron lasers, which at the earliest won't be available until the second half of the next decade.<sup>120</sup> Electromagnetic rail-guns offer the promise of delivering high-energy projectiles at long ranges. But using such projectiles to defend against saturation attacks of maneuvering supersonic missiles remains a speculative proposition.

Economics may also argue against hardening fixed bases in the region that are within range of China's most common land-attack missile types. It will likely be cheaper for China to acquire additional missiles than it will be for the U.S. to add protective reinforced concrete and other hardening measures to its air and naval bases, in a manner that would keep those bases functioning effectively in wartime.

U.S. military forces should be prepared to degrade and disrupt China's intelligence-surveillance-reconnaissance (ISR) sensors and the command and communication networks that will support and direct Chinese missile and aerospace forces. By doing so, U.S. forces would deny Chinese systems such as the DF-21D anti-ship ballistic missile, long range land-attack cruise missiles, and hypersonic glide vehicles (HGV) the targeting and guidance information they would need to complete their missions. Such "left kill chain" solutions will be critical for U.S. forces, especially for high-end threats such DF-21D and HGVs

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<sup>119</sup> Jim Kilby, "Surface Warfare: Lynchpin of Integrated Air/Missile Defense," Center for International Maritime Security, April 4, 2014, <http://cimsec.org/surface-warfare-lynchpin-naval-integrated-airmissile-defense>.

<sup>120</sup> Ronald O'Rourke, "Navy Shipboard Lasers for Surface, Air, and Missile Defense: Background and Issues for Congress," Congressional Research Service, April 24, 2013, 12-3, <http://www.fas.org/sgp/crs/weapons/R41526.pdf>.

which will likely be very difficult challenges for conventional missile defense systems.

But U.S. forces must similarly be prepared for Chinese “blinding” attacks on U.S. sensors and communication networks. In a potential conflict in East Asia, such an exchange of blows against both side’s ISR and command networks could favor the Chinese “home team” which could have an easier task of restoring these functions than would U.S. expeditionary forces. U.S. forces should therefore anticipate the disruption of its space-based ISR and command networks and be prepared to execute its missions without the benefit of those assets.

More broadly, the United States should greatly increase its investment in long range platforms that are based outside the range of China’s main missiles forces and that are stealthy enough to operate at will inside China’s defenses. U.S. platforms that meet these conditions include the new Long Range Strike Bomber (LRS-B) and U.S. attack and guided missile submarines armed with land-attack missiles. When acquired in sufficient quantities, such platforms would be able to hold at risk assets and conditions highly valued by China’s leaders. Doing so would create doubts about the efficacy of Chinese military options, thus enhancing deterrence and stability in the region.

### **Mitigating China’s Nuclear Capabilities**

China is pursuing several programs to modernize its nuclear weapon delivery systems. The purpose of these programs is to enhance the survivability of China’s nuclear deterrent by allowing its nuclear-armed missiles to move, disperse, and hide. The Second Artillery Force recently brought into service the DF-31A road-mobile intercontinental ballistic missile (ICBM), which is thought to have a range exceeding 11,200 kilometers, sufficient to reach most of the continental United States. A new road mobile ICBM, the DF-41 is similar but has the added capability of delivering multiple independently targeted warheads (MIRVs). At sea, the *Jin*-class ballistic missile submarine (Type 094) is a high priority for the Chinese navy. This class of submarine will carry the JL-2 strategic nuclear missile with an estimated range of 7,400 kilometers.<sup>121</sup>

China’s deployment of multi-warhead MIRV missiles, its possible development of nuclear-armed and maneuvering HGVs, and its development of technologies designed to thwart missile defenses will increase the sophistication of China’s nuclear forces. U.S. defenses against ICBMs have not been designed to provide robust protection against substantial nuclear powers such as Russia and China. And as with conventional missiles, a spending competition between additional Chinese offensive missiles and U.S. ICBM interceptors would not be favorable for the United States because the marginal cost of interceptors will likely exceed the cost of their targets by at least an order of magnitude.

The United States will thus need to rely on the long-standing principles of nuclear deterrence to mitigate potential quantitative and qualitative expansions of China’s nuclear forces. In order to maintain effective nuclear deterrence for the decades ahead, the United States should commit to programs such as the new generation of ballistic missile submarines to replace the current Trident submarine class, the new long range bomber (mentioned above), and improvements to global communication systems to ensure nuclear command and control under all conditions. Funding and fielding these next-generation systems will provide enduring nuclear capabilities and signal to potential adversaries a strong commitment by the United States to nuclear deterrence.

### **The Intermediate Nuclear Forces Treaty and Security Trends in the Asia-Pacific Region**

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<sup>121</sup> “Annual Report to Congress: Military and Security Developments Involving the People’s Republic of China 2014,” 7-8.

The Intermediate Nuclear Forces (INF) Treaty, entered into by the United States and the Soviet Union in 1987, prohibited both countries from possessing land-based ballistic and cruise missiles with ranges between 500 and 5,500 kilometers. This treaty remains in force and continues to proscribe the theater-range missile forces of the United States and Russia. China is not a party to the treaty; land-based theater-range ballistic and cruise missiles are a major component of China's military modernization program and its access-denial strategy in the Western Pacific region.

As long as U.S. military planners could count on the dominance of U.S. naval and aerospace power projection systems, the restraints imposed by the INF treaty were of little concern. However, as described above, these assumptions will become increasingly questionable over the medium term and will require the United States to search for affordable means and ways to retain its power projection capabilities in the region.

U.S. policymakers should study the benefits and costs of abrogating the INF treaty. Current U.S. modernization programs such as the LRS-B and a new sea-launched land-attack cruise missile offer the prospect of maintaining robust power projection capacity in spite of China's growing access-denial capabilities. However, there are always risks that technical shortcoming, program mismanagement, and adversary countermeasures could thwart the arrival of the power projection capacities promised by these programs (and which are permitted under the treaty). Supplementing these air and sea approaches with land-based theater-range missiles would diversify the power projection portfolio. Land-based theater-range missiles, the deployment of which would require abrogation of the treaty, will not be an affordable substitute for the sustained striking power of the future LRS-B force.<sup>122</sup> But fielding such a capability would provide more options to U.S. policymakers and commanders while complicating an adversary's planning.

Abrogating the treaty would come with costs and risks. The United States would pay a political and diplomatic price for abrogating the treaty. It would release Russia from any remaining inhibitions on its missile programs (the U.S. State Department already believes that recent Russian missile tests have violated the treaty),<sup>123</sup> which could have harmful effects for European security. And the United States would have to find acceptable bases in Asia for such missiles, a task which could be politically complicated.

U.S. policymakers will have to examine whether the diversification benefits of theater-range land-based missiles in the Asia-Pacific would be worth the political and program costs a new missile force would require. The U.S. at present is not compelled to abrogate the treaty to achieve its goals in the region. But policymakers should monitor the factors that could compel such a decision.

### **China's Views on National Missile Defense**

China is developing its ballistic missile defense capabilities for the purpose of defending its homeland and strategic assets.<sup>124</sup> China's most advanced surface-to-air missile systems (the S-300 system imported from Russia and the indigenously-produced CSA-9 system) currently provide a limited capability to intercept ballistic missiles with ranges from 500 to 1,000 kilometers. China has a research program to develop the capability to achieve exo-atmospheric intercepts of ballistic missile warheads, a capability suitable for

<sup>122</sup> Robert Haddick, "Why the New Bomber is a Good Investment," *War on the Rocks*, February 26, 2015, <http://warontherocks.com/2015/02/why-the-new-bomber-is-a-good-investment/>.

<sup>123</sup> U.S. Department of State, "Adherence to and Compliance with Arms Control, Nonproliferation, and Disarmament Agreements and Commitments," July 2014, 8-10, <http://www.state.gov/documents/organization/230108.pdf>.

<sup>124</sup> "Annual Report to Congress: Military and Security Developments Involving the People's Republic of China 2014," 34.

intercepting theater and intermediate range ballistic missiles.

In July 2014 China conducted a non-destructive missile interceptor test from Chinese territory up to the altitude of low earth orbit. Although China termed this a “land-based missile interception test,” the United States government is highly confident that this was instead a test of an anti-satellite weapon.<sup>125</sup>

While China develops its own ballistic missile defenses, it has objected to the enhancement of U.S. ballistic missile defense capacity in Asia. China recently protested the proposed deployment of the U.S. Army’s Terminal High Altitude Air Defense (THAAD) missiles and radar to South Korea.<sup>126</sup> The purpose of the THAAD deployment to South Korea is to defend against the North Korean missile threat to South Korea and Japan.

U.S. State Department officials have explained to counterparts in China that U.S. national missile defense capabilities present no threat to the efficacy of China’s strategic nuclear deterrent and thus are not destabilizing.<sup>127</sup> By the same token, China’s national missile defense program is in its relative infancy and is not likely to present a challenge to U.S. strategic nuclear forces for some time if ever. We should thus expect that absent an unexpected breakthrough in missile defense technology, national missile defense developments on both sides will not likely pose a threat to nuclear stability for at least the medium term.

### **Missiles, Defenses, and Diplomatic Prospects**

Both the United States and Chinese governments should recognize an interest in sustaining nuclear stability. Both sides should also be wary about the potential for unexpected technical breakthroughs that could suddenly improve the effectiveness and reduce the cost of national missile defenses. Such a development could destabilize the strategic nuclear relationship.

There should thus be an incentive for the United States and China to discuss ways to maintain nuclear stability. Such discussions should include a review of intentions and developments regarding national missile defense. However, as with much of the rest of its military modernization and strategic intentions, Chinese officials have displayed little interest in substantive discussion of these issues.

China’s buildup of its missiles forces, combined with the increasing vulnerability of the U.S. military’s short-range, forward-based forces, creates an increasingly unstable military situation in East Asia. U.S. military planners believe that China’s conventional missile doctrine is based on deception, surprise, and mass strikes on an adversary’s perceived centers of gravity, such as command systems and bases.<sup>128</sup> With ballistic missile flight times so short, U.S. commanders in the theater may increasingly believe themselves to be in a “use it, or lose it” situation. This only increases the incentives for both sides to strike first during a potential crisis, an obviously worrying trend.<sup>129</sup>

There should thus be incentives for both sides to discuss ways of reducing risk, increasing stability,

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<sup>125</sup> Frank A. Rose, Assistant Secretary of State, Bureau of Arms Control, Verification and Compliance, “Ballistic Missile Defense and Strategic Stability in East Asia,” Remarks to the Federation of American Scientists, February 20, 2015, U.S. Department of State website, <http://www.state.gov/t/avc/rls/2015/237746.htm>.

<sup>126</sup> Sujoon Yoon, “Are China’s THAAD Fears Justified?” *The Diplomat*, February 20, 2015, <http://thediplomat.com/2015/02/are-chinas-thaad-fears-justified/>.

<sup>127</sup> Frank A. Rose, “Ballistic Missile Defense and Strategic Stability in East Asia.”

<sup>128</sup> Forrest E. Morgan, Karl P. Mueller, Evan S. Medeiros, Kevin L. Pollpeter, and Roger Cliff, *Dangerous Thresholds: Managing Escalation in the 21st Century*, (Santa Monica, CA: RAND Corporation, 2008), 68-9.

<sup>129</sup> David C. Gompert and Martin Libicki, “Cyber Warfare and Sino-American Crisis Instability, *Survival: Global Politics and Strategy*, Vol. 56, No.4, August-September 2014, 8-10.

forming ways to avoid crises, and defusing them should they occur. On-and-off attempts at military-to-military contacts between the United States and China have yet to produce much progress toward reassurance and confidence-building. More broadly, Chinese officials remain resistant to exchanging data on China's nuclear forces, its missile inventories, or their views on China's security requirements over the medium to long term. There would seem to be little prospect for successful arms control negotiations until Chinese officials are ready for substantive discussions on military-technical issues.

In spite of these barriers, U.S. officials should continue to engage their Chinese counterparts on the full range of strategic issues in order to keep open the opportunity for progress. Meanwhile the U.S. government should accelerate the modernization of its military forces and operational concepts, and expand diplomacy with its partners in the region. Continuing engagement with China, accelerated military modernization, and stepped up diplomatic action with regional partners are complementary activities and will boost deterrence and stability.

## **Conclusion**

China is exploiting the missile and sensor technical revolution to execute a cost-imposing strategy on the United States and its partners in the Asia-Pacific region. The United States and its partners need to fashion an effective and affordable response if they are to maintain stability in this vital region. A competitive strategy would expand U.S. engagement and security assistance in the region, rebalance U.S. striking power toward long-range airpower and submarines, and assemble a broad portfolio of military and non-military tools to increase the leverage of the United States and its partners.

A well-designed and competently executed U.S. strategy for the Asia-Pacific region will create affordable and sustainable leverage with an aim to influence China's behavior in favorable ways during an open-ended peacetime security competition. The result from that will be increased deterrence, enhanced regional stability, and the conditions for continued prosperity that will benefit all, including China. Achieving this outcome will require imaginative and sustained commitment by future generations of America's policymakers. That is the challenge these leaders face but one that promises great benefits for the United States and the region.

**OPENING STATEMENT OF EVAN MONTGOMERY, PH.D.  
SENIOR FELLOW, CENTER FOR STRATEGIC AND BUDGETARY ASSESSMENTS**

DR. MONTGOMERY: Vice Chairman Shea, Commissioner Tobin, other members of the Commission, thank you for the opportunity to participate in this hearing and to share my thoughts on the implications of China's offensive missile forces.

My remarks today will focus on three issues: first, how China's offensive missile forces are making the U.S. strategy of forward defense more challenging; second, how the United States could use offensive missile forces of its own to enhance deterrence and improve crisis stability; and third, how the United States might navigate some of the diplomatic barriers to developing some of those forces, in particular the Intermediate-Range Nuclear Forces Treaty.

For decades, China has been developing a variety of anti-access/area-denial systems, or A2/AD systems, that could impede U.S. power projection during a crisis or conflict. For instance, Beijing is fielding capabilities that can hold at risk U.S. forward bases, its high-signature air and naval platforms, and its information networks, to include space-based platforms and computer networks as well. This includes a large arsenal of ground-launched ballistic and cruise missiles that can be used to attack targets on land, at sea, and in space.

Why has China placed so much emphasis on ground-launched offensive missiles, in particular? These weapons have a number of advantages over combat aircraft, naval platforms, and other alternatives that are worth noting. For example, they are much less expensive to procure, they are much cheaper than existing countermeasures, and they are orders of magnitude cheaper than many potential targets.

They're also difficult to locate, interdict, and disrupt before being launched, and finally they are difficult to intercept once in flight.

These attributes are particularly worrisome because the U.S. military's combat power in East Asia is heavily concentrated in a handful of air bases and aircraft carriers. That means the United States is likely to become increasingly dependent on bombers that can operate from bases outside the theater as well as submarines that are difficult to detect, potentially overextending these scarce assets. It also means that Beijing might be tempted to launch an attack when tensions are high.

Now, how should the United States respond to these challenges? There are a number of steps that it could take to preserve its military power-- many of which Mr. Haddick just mentioned: fielding a new penetrating bomber to supplement and eventually replace the aging B-2; acquiring a carrier-based surveillance and strike platform that can significantly extend the range of the existing air wing; building undersea warfare systems with greater payload capacity; and investing in new active and passive defenses to protect forward operating locations.

It could also take a page from China's playbook and develop ground-launched missile forces of its own, including missiles to counter ships at sea as well as strike targets on land.

In general, missile forces could increase the overall volume of firepower that the United States could bring to bear in a conflict, especially if they were forward-stationed in the region.

They could create new military options for the United States and enable the development of new operational concepts.

They could impose costs on China because it would have to devote significant resources to both missile defense as well as missile suppression.

They could also create bargaining leverage with China, which currently has no incentive to accept any limits on its offensive missile forces.

Lastly, they could assure local allies if China becomes more assertive and more powerful because ground-based missiles are more difficult to hold at risk than aircraft on the ground or ships in port, and, unlike aircraft or ships, they cannot easily be withdrawn during a crisis.

Now, at present, the United States has virtually no ground-based missiles that would actually help to deter conflict with China although there are some capabilities in development that could be adapted to play that role.

One of the reasons the United States doesn't have these capabilities is because it's a party to the

INF Treaty, which bars Washington and Moscow from testing and deploying surface-to-surface ballistic and cruise missiles, whether they are nuclear-armed or conventionally-armed, that have ranges between 500 and 5,500 kilometers.

The INF Treaty is now under duress, however, and it might not persist in its current form, if it survives at all.

Last year, the State Department revealed that Russia was in violation of its INF obligations by testing a prohibited ground-launched cruise missile. There have also been reports that Russia is circumventing the treaty in particular by testing intercontinental ballistic missiles at intermediate ranges.

Not surprisingly, Russian cheating has prompted a host of arguments for how the United States should respond, from urging Moscow to resume complying with the treaty to withdrawing from it in retaliation.

Now, there may be other options worth considering, such as modifying the treaty. For instance, Washington and Moscow could agree to sanction the development of intermediate range missiles and preserve the ban on missile deployments in Europe, but lift the ban on missile deployments in Asia-- something that might be appealing to Russia if its interest in exiting INF stems more from its need to counterbalance China than a desire to coerce NATO.

This option or something like it would enable the United States to develop and potentially deploy ground-launched missile forces in the Western Pacific without necessarily jeopardizing the military balance in Europe. It could also drive a wedge between China and Russia since there would be little doubt that Moscow's pursuit of new missiles was directed squarely at Beijing.

Now some type of modified treaty might not seem feasible or desirable at present for a number of reasons that I'd be happy to discuss, but I would conclude with two points:

First, during the original INF negotiations in the 1980s Moscow wanted to retain some of its missiles in Asia, but at the time Washington had enough leverage and an incentive to encourage Russia to abandon them all. So the idea itself is not unprecedented.

Second, it's necessary to consider any type of modification in the context of potential alternatives. Right now those alternatives seem to be either continuing with an arms control agreement that binds the United States but that Russia cheats on or abrogating that agreement and sacrificing any constraints at all on Russia's behavior.

So with that, I thank you for your time, and I look forward to your questions.



**PREPARED STATEMENT OF EVAN MONTGOMERY, PH.D.  
SENIOR FELLOW, CENTER FOR STRATEGIC AND BUDGETARY ASSESSMENTS**

**April 1, 2015  
MANAGING CHINA'S MISSILE THREAT:  
FUTURE OPTIONS TO PRESERVE FORWARD DEFENSE**

**TESTIMONY BEFORE THE U.S.-CHINA ECONOMIC AND SECURITY  
REVIEW COMMISSION HEARING ON "CHINA'S OFFENSIVE  
MISSILES FORCES: IMPLICATIONS FOR THE UNITED STATES"**

**By Evan Braden Montgomery  
Senior Fellow  
Center for Strategic and Budgetary Assessments**

Vice Chairman Shea, Commissioner Tobin, and other Members of the Commission: thank you for the opportunity to participate in this hearing and share my thoughts on the implications of China's offensive missiles. This is an increasingly important issue, not only for the United States, but also for its allies and partners throughout East Asia. Following the Cold War, the United States enjoyed a very large—and largely uncontested—conventional military advantage in the region. That advantage is eroding, however, and China's missile arsenal is a major reason why. My remarks will focus on how China's offensive missile forces are making the U.S. strategy of forward defense more challenging; how the United States could use offensive missile forces of its own to enhance deterrence and improve crisis stability; and how it might navigate the diplomatic barriers to developing those forces, in particular the Intermediate-Range Nuclear Forces (INF) Treaty.

**Assessing the Implications of China's Missile Arsenal**

The security environment in the Asia-Pacific is currently experiencing a number of worrisome trends, including the escalation of maritime territorial disputes in the East and South China Seas, the proliferation of advanced military capabilities to a number of local actors, and a shifting balance of power. China's efforts to strengthen its armed forces are at the center of each one. As a result, there is a growing debate over whether and how the United States should adapt its military strategy, posture, and force structure in response.

For decades, China has been preparing the People's Liberation Army (PLA) to fight local conflicts against technologically superior opponents. As part of this effort, it has been developing a variety of anti-access/area-denial (A2/AD) systems, which could exploit vulnerabilities in the American style of expeditionary warfare to impede U.S. power-projection during a crisis or conflict.<sup>130</sup> Since the end of the Cold War, the United States has grown accustomed to facing opponents that are too weak to seriously threaten its overseas bases, air and naval forces, and battle networks, all of which underpin its ability to conduct and sustain large-scale military operations abroad. Today, however, Beijing is fielding capabilities that can hold at risk fixed forward bases, menace high-signature air and naval platforms, and disrupt the United States' ability to collect, store, and transmit information. In particular, the PLA has amassed a large arsenal of ground-launched ballistic and cruise missiles for land-attack, sea-denial, and anti-satellite operations.<sup>131</sup>

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<sup>130</sup> Anti-access capabilities are used to prevent or constrain the deployment of opposing forces into a theater of operations, whereas area-denial capabilities are used to restrict their freedom of maneuver once in theater. See Andrew F. Krepinevich, Jr., "The Pentagon's Wasting Assets," *Foreign Affairs*, 88, No. 4, July/August 2009. On the characteristics of the American style of expeditionary warfare see Alan Vick, "Challenges to the American Way of War," Remarks to the Global Warfare Symposium, Los Angeles, CA, November 17, 2011.

<sup>131</sup> For an overview of China's military capabilities and strategy, see Office of the Secretary of Defense, *Military and Security Developments Involving the People's Republic of China 2014*, Annual Report to Congress (Washington, DC: DoD, 2014).

Why has China placed so much emphasis on ground-launched offensive missile forces to support its “counter-intervention” strategy, and why are these systems such a cause for concern in the United States and among local nations? Initially, mastering missile technology offered the PLA a way to compensate for the limitations of its air and maritime power-projection capabilities. Yet ground-launched offensive missiles have a number of inherent advantages over combat aircraft and naval platforms—advantages that could allow China to deliver a significant amount of firepower against critical targets in a relatively short period of time.

Specifically, ground-launched offensive missiles are:

- *A cost-effective way to generate combat power in the early stages of a campaign.* Ballistic and cruise missiles are far less expensive to procure than aircraft or ships, much cheaper than most existing air and missile defenses, and orders of magnitude cheaper than many prospective targets.
- *Difficult to locate, interdict, or otherwise disrupt before and immediately after being launched.* Well-trained operators can deploy mobile platforms to hide sites that are hard to detect, maneuver them to pre-surveyed positions when they are ready to fire their payloads, tear down their equipment within minutes of executing an attack, and relocate them before being discovered. They can also transmit and receive information over hardened, dedicated, and closed systems like buried fiber optic networks, which are more difficult to jam than radio frequency transmissions and less vulnerable to attack than air- or space- based communications systems.
- *Difficult to intercept once in flight.* Ballistic missiles have high terminal velocities and can be designed to maneuver or equipped with penetration aids. Alternatively, cruise missiles are often relatively slow, but stealthy, and can be programmed to follow complex flight paths that stress air defense systems.

The dangers posed by China’s missiles are also magnified by the relatively fragile nature of the United States’ military posture in East Asia. U.S. air-to-air combat capability and air-to-ground strike capacity are currently concentrated in tactical aviation platforms that must operate from a handful of close-in land bases or a few aircraft carriers in order to be effective. With so many eggs in so few baskets, and with those baskets increasingly vulnerable given their proximity to China (e.g., air bases on the island of Okinawa) or their need to take up station inside its threat ring (e.g., aircraft carriers), Beijing might be tempted to launch a missile attack when tensions are high, one that could shift the military balance in its favor.

Of course, the United States would still be able to conduct a strike campaign in response using bombers that can operate from range and submarines that are difficult to detect, even if local air bases were under assault and carriers were damaged or held back. Yet U.S. bombers are few in number, especially penetrating bombers that can survive inside defended airspace, while submarines have shallow weapons magazines, and therefore must find a safe port to reload once they exhaust their limited inventory of munitions. Penetrating long-range strike aircraft and undersea warfare systems are also likely to be tasked with a wider range of missions given the growing missile threat to forward bases and surface naval platforms, potentially overstressing these high-demand/low-density assets.

In sum, the conventional military balance in East Asia is characterized by an emerging asymmetry in the ability to generate combat power, especially at the outset of a conflict. If that asymmetry persists or shifts further in China’s favor, it could weaken deterrence, undermine crisis stability, and make it much more difficult for the United States to defend its interests in the region.

### **Could U.S. Missiles Help Turn the Tide?**

How should the United States respond to these challenges? There are a number of steps that it could take

to preserve its military power: fielding a new penetrating bomber to supplement and eventually replace the aging B-2; acquiring a carrier-based surveillance and strike platform that significantly extends the range of the air wing; building undersea warfare systems with greater payload capacity; and investing in new active and passive defenses to protect forward operating locations.<sup>132</sup>

It could also emulate China by developing ground-launched missile forces of its own.<sup>133</sup> For instance, U.S. ground-launched offensive missiles could:

- *Increase the overall volume of firepower that the United States could bring to bear.* That, in turn, could deter China from launching an attack in the hope of inflicting a decisive blow against forward-operating forces. It could also provide alternative military options in the event that deterrence fails and Beijing inflicts significant losses on U.S. forces, disrupts flight operations at theater airbases, and compels carrier strike groups to remain beyond the effective range of their air wings.
- *Create new military options for the United States and enable the development of novel operational concepts.* Ground-launched missiles could hold at risk opposing surface naval forces when U.S. anti-surface warfare and maritime-strike capabilities were unavailable, and could attack targets on land before enemy air defenses have been suppressed or destroyed.
- *Impose costs on China.* Beijing might devote significant resources to defend against missile attacks, a threat that it does not currently face and therefore can largely ignore. It might also invest in the persistent surveillance and strike systems necessary to suppress offensive missile forces, which it does not need at present. As the United States knows well, missile defense and missile suppression are demanding missions with expensive capability requirements.
- *Create bargaining leverage with China.* Although Beijing has no incentive to accept any limits on its missile forces right now, that could change if it faces a missile buildup.
- *Assure local allies.* If air bases and surface naval forces become increasingly vulnerable, the United States might be tempted to remove critical assets from the region during a crisis—a decision that could damage key alliance relationships. Ground-launched missile systems are more difficult to hold at risk than aircraft or ships, however, and cannot easily be withdrawn.<sup>134</sup>

What specific roles might ground-launched missiles play? Anti-ship missiles could be used for sea-denial, including chokepoint defense and open-ocean targeting. The former might entail blocking hostile surface naval forces from exiting China's "near seas" and operating in the waters between the first and second island chains, where they could encircle allies like Japan or interdict U.S. forces en route to the region.<sup>135</sup> The latter might involve holding at risk hostile surface naval forces that attempt to seize disputed territory, impede freedom of navigation, or enforce a maritime blockade against a local nation. Alternatively, land-attack missiles could be used for deep-strike: holding at risk surveillance systems, command-and-control facilities, air bases, and other potential targets located on an adversary's territory.<sup>136</sup>

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<sup>132</sup> Evan Braden Montgomery, "Contested Primacy in the Western Pacific: China's Rise and the Future of U.S. Power Projection," *International Security*, 38, No. 4, Spring 2014.

<sup>133</sup> Jim Thomas, "Why the U.S. Army Needs Missiles," *Foreign Affairs*, May/June 2013.

<sup>134</sup> Importantly, most of the benefits outlined above would obtain only if ground-launched missiles were forward-garrisoned in frontline nations such as Japan and the Philippines, rather than deployed into the theater during a crisis.

<sup>135</sup> The term "near seas" refers to the Yellow Sea, East China Sea, and South China Sea. The first island chain runs from Japan to the Malay Peninsula and rings the near seas, while the second island chain extends farther west to the Marianas.

<sup>136</sup> Terrence R. Kelly et al., *Employing Land-Based Anti-Ship Missiles in the Western Pacific*, Technical Report (Santa Monica, CA: RAND, 2013); and James R. Holmes, "Defend the First Island Chain," *Proceedings*, U.S. Naval Institute, 140, No. 4, April 2014; and Andrew F. Krepinevich, "How to Deter China: The Case for Archipelagic Defense," *Foreign*

The United States does not presently have the capabilities to support these missions. Notably, the U.S. Army—which is the logical candidate to spearhead new ground-based sea-denial and deep-strike efforts—does possess some extended-range indirect-fire systems. Yet these systems were designed for combined arms operations against opposing mechanized and armored units at ranges of several dozen or, at most, several hundred kilometers. They cannot, therefore, be used effectively against surface naval forces or more distant targets on land. The United States could modify existing or planned systems to fill these gaps. For instance, it could extend the range of the Army Tactical Missile System (ATACMS) and/or give it the sensor package necessary to strike maritime targets. It could also adapt air- or ship-launched weapons such as the Long-Range Anti-Ship Missile (LRASM) for use with ground-based delivery system. To date, however, there are no publicly announced plans to do so.

### **Reconsidering the INF Treaty**

Despite the potential virtues of missile forces, there are a number of barriers that could prevent the United States from pursuing this option. The U.S. Army might oppose taking on new missions that could draw resources away from its traditional areas of emphasis, such as combined-arms maneuver warfare. That barrier could erode over time, however, as the Army searches for a major role in the Western Pacific. In addition, local allies might balk at the idea of hosting missile forces on their territory given domestic political constraints and the potential for Chinese retaliation. Yet they might become increasingly receptive in the near future, particularly if China becomes more assertive, the U.S. military posture becomes more vulnerable, and tensions in the region continue to rise. Finally, certain types of missile forces are prohibited by the INF Treaty, which bars the United States and Russia from testing and deploying surface-to-surface ballistic and cruise missiles—whether they are nuclear-armed or conventionally-armed—with ranges between 500 and 5500 kilometers. The INF Treaty is under duress, however, and might not persist in its current form, if it survives at all.

In July 2014, the State Department publicly revealed what many already suspected—namely that Russia was in violation of its INF obligations. Washington has accused Moscow of testing a prohibited ground-launched cruise missile, although it has not revealed the system in question.<sup>137</sup> Some observers have also raised concerns that Moscow has tested a surface-to-surface ballistic missile at ranges that exceed INF's restrictions (technically making it an intercontinental ballistic missile that is exempt from INF but captured by the New START Treaty), as well as at ranges that fall within INF's bounds (indicating that it might be used as an intermediate-range weapon irrespective of its treaty classification).

By most accounts this would be a circumvention of the INF Treaty rather than a violation, although it does raise additional concerns about Russian intentions.<sup>138</sup>

Moscow's lack of compliance with both the letter and spirit of the INF Treaty is not surprising, given that senior Russian officials proposed withdrawing from it nearly a decade ago.<sup>139</sup> Nevertheless, Russian cheating has prompted a host of arguments for how the United States should respond, from urging Moscow to resume complying with the treaty to withdrawing from it in retaliation.<sup>140</sup> There is a third option worth consider as well, especially if Russian non-compliance appears unavoidable: modifying the treaty. For instance, Washington and Moscow could agree to sanction the development

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*Affairs*, March/April 2015. For a skeptical view, see David W. Kearns, Jr., *Facing the Missile Challenge: U.S. Strategy and the Future of the INF Treaty* (Santa Monica, CA: RAND, 2012).

<sup>137</sup> U.S. Department of State, *Adherence to and Compliance With Arms Control, Nonproliferation, Disarmament Agreements and Commitments* (Washington, DC: U.S. Department of State, July 2014), pp. 8–10. See also James R. Clapper, "Worldwide Threat Assessment of the U.S. Intelligence Community," Statement for the Record, Senate Armed Services Committee, February 26, 2015, p. 7.

<sup>138</sup> Steven Pifer, "The Moscow Missile Mystery: Is Russia Actually Violating the INF Treaty," *Foreign Policy*, January 31, 2014; and Jeffrey Lewis, "An Intercontinental Ballistic Missile by Any Other Name," *Foreign Policy*, April 25, 2014.

<sup>139</sup> Robert M. Gates, *Duty: Memoirs of a Secretary at War* (New York: Alfred A. Knopf, 2014), p. 154.

<sup>140</sup> Steven Pifer, "Don't Scrap the INF Treaty," *The National Interest*, June 9, 2014; and John Bolton and John Yoo, "An Obsolete Nuclear Treaty Even Before Russia Cheated," *Wall Street Journal*, September 9, 2014. See also Elbridge Colby, "The Real Trouble with Russia," *Foreign Affairs*, April 7, 2014; and Tom Nichols, "The INF Treaty and Russia's Road to War," *The National Interest*, August 2, 2014.

of intermediate-range missiles, preserve the ban on missile deployments in Europe, and lift the ban on missile deployments in Asia.<sup>141</sup>

Given Russia's eroding military position relative to China, historical tensions between the two neighbors, and their competition for influence in the Russian Far East, there are reasons to suspect that Moscow's interest in exiting INF stems more from the need to counterbalance Beijing than the desire to coerce Brussels.

In 2007, President Putin hinted that he might pull out of the treaty unless it was adapted to include other countries. Otherwise, he argued, "It will be difficult for [Russia] to keep within the framework of the treaty in a situation when other countries do develop such weapons systems, and among those are countries in our near vicinity."<sup>142</sup> This may have been more than empty rhetoric or an effort to make the U.S. think twice about deploying missile defenses in Europe. Recent reports suggest that Russia plans to station the RS-26 intercontinental ballistic missile—which it has apparently tested to intermediate ranges—in Irkutsk. That would place it within range of China but outside the range of many targets in Europe.<sup>143</sup> Interestingly, during the original INF negotiations, Moscow wanted to retain some of its missiles in the East rather than destroy them all, but Washington insisted on a "global double zero" option that would outlaw these weapons irrespective of their location.

An "Asia option" could have at least two potential benefits:

- *It would enable the United States to develop and deploy ground-launched missile forces in the Western Pacific.* As described above, this could enhance deterrence and improve crisis stability as China's military becomes more powerful.
- *It would drive a wedge between China and Russia.* In this scenario, there would be little doubt that Moscow's pursuit of new missiles was directed squarely at Beijing.

Pursuing this option would certainly raise concerns about the reaction of U.S. allies in Asia, the possibility that Beijing might accelerate its own missile deployments in response, and Washington's ability to monitor and verify the new arrangement. All of these concerns are reasonable, but they are not necessarily unmanageable. For instance, if China's military power continues to grow, allies like Japan and the Philippines might become increasingly receptive to hosting U.S. missile forces, as well as more willing to tolerate Russian weapons that are aimed primarily at China. In addition, while Beijing could certainly field more missiles in response, it might not be willing to run an arms race with two major powers at the same time. Finally, monitoring the location of mobile missiles in a country as large as Russia would certainly be a difficult task. If Russia has no interest in adhering to the existing treaty, however, then the United States will have to address this challenge irrespective of INF's status and provisions.

### Conclusion

The United States has several core interests in East Asia: preventing a single actor from dominating the region, protecting allies and security partners, and preserving freedom of the commons. China's growing missile arsenal could enable Beijing to challenge them all. To sustain a military strategy of forward defense despite a shifting balance of power, Washington might need to consider steps it has avoided in the past, including the development of new ground-launched missile forces. That could require

<sup>141</sup> I have previously made the case for this option and addressed criticisms of it in a series of articles: Evan Braden Montgomery, "China's Missile Forces are Growing: Is It Time to Modify the INF Treaty?" *The National Interest*, July 2, 2014; Evan Braden Montgomery, "How Should America Respond to China's Deadly Missile Arsenal?" *The National Interest*, September 19, 2014; and Evan Braden Montgomery, "Time for American Land-Based Missile Forces to Counter China?" *The National Interest*, October 14, 2014.

<sup>142</sup> Quoted in Demetri Sevastopulo and Neil Buckley, "Putin Dismisses US Missile Shield Plan," *Financial Times*, October 13, 2007. This is not the only time that Russian officials or others have suggested "multilateralizing" INF. But nations with large arsenals of intermediate-range missiles—like China—have little to gain by joining the treaty at present.

<sup>143</sup> See Pavel Podvig, "First RS-26 to be Deployed in Irkutsk in 2015," *Russian Strategic Nuclear Forces*, July 1, 2014, available at [http://russianforces.org/blog/2014/07/first\\_rs-26\\_to\\_be\\_deployed\\_in.shtml](http://russianforces.org/blog/2014/07/first_rs-26_to_be_deployed_in.shtml).

taking a hard look at the INF Treaty, however, which has served U.S. interests for nearly three decades, but might soon be obsolete.

**About the Center for Strategic and Budgetary Assessments**

The Center for Strategic and Budgetary Assessments (CSBA) is an independent, nonpartisan policy research institute established to promote innovative thinking and debate about national security strategy and investment options. CSBA's goal is to enable policymakers to make informed decisions on matters of strategy, security policy and resource allocation. CSBA provides timely, impartial and insightful analyses to senior decision makers in the executive and legislative branches, as well as to the media and the broader national security community. CSBA encourages thoughtful participation in the development of national security strategy and policy, and in the allocation of scarce human and capital resources. CSBA's analysis and outreach focus on key questions related to existing and emerging threats to US national security. Meeting these challenges will require transforming the national security establishment, and we are devoted to helping achieve this end.

**OPENING STATEMENT OF ELBRIDGE COLBY  
GATES FELLOW, CENTER FOR NEW AMERICAN SECURITY**

MR. COLBY: Thank you very much. Vice Chairman Shea, other distinguished members of the Commission, thank you very much again for inviting me here today to discuss the implications of China's military buildup, including its growing arsenal of offensive missile forces.

The PRC's development of these military capabilities, including its missile arsenal, pose a growingly significant challenge to the interests of the United States, as you've heard already on this panel and earlier today. How then should the United States respond?

The best way I think to respond and to mitigate the negative implications of rising Chinese military power is actually relatively simple, and that is to maintain U.S. military advantage in the Western Pacific. Such superiority is the most reliable way to convince any plausible leadership in Beijing that attempts to use its newfound military power for aggressive purposes would be futile, costly and unwise, and thus to ensure Beijing's respect for the interests of the United States and for those of our allies and partners.

But, because of China's growing wealth and sophistication, as well as its evident resolve to continue building up a more formidable military, this is an illustration of the old dictum that strategy is simple but very hard.

It is crucial, nonetheless, I think, to try to maintain such advantage where feasible, as even a diminished margin of strength is preferable to losing all such advantage.

What, then, does maintaining such military primacy in the context of China's growing power actually mean? I would propose that what it practically means is the ability to fight a limited war in the Western Pacific better than China can. Why? The defining aspects of the strategic problem for the United States in the Asia-Pacific are China's growing military power and its increasing ability to escalate against the United States and our allies and partners in ways that negate our military capabilities or cause us great harm.

This means both that the United States and our affiliates will find it harder to defeat China and control escalation in ways we prefer and that we will be increasingly vulnerable to serious attack by the PRC. Washington, as well as its allies and partners, will therefore have a very great interest in limiting the destructiveness of any conflict with China.

Needless to say, China will also have immense incentives to limit a conflict with the United States and our allies and partners. Within this context, the United States and our allies and partners will want to seek to favorably limit a war in ways that both protect ourselves and that allow us to prevail. This basically means being able to shape a conflict in such a way that an adversary such as China will accept some sort of defeat, albeit a limited one, rather than elect to resort to its ability to escalate further.

This logic, I believe, has significant implications for the kind of military force the United States should procure and the kinds of doctrines and strategies it should develop. In particular, it means having a joint force that can prevail in a limited context that does not, in other words, rely on escalation that would be foolhardy or ineffective, while retaining substantial advantages should the conflict escalate to higher, wider, or more intense levels.

This in turn dictates that the United States should develop a joint force that can contest and ideally defeat Chinese aggression through a "direct defense" approach, as Dr. Montgomery and others have ably argued for; supplement or backstop that direct approach with indirect strategies; and that together is designed to allow the United States to favorably control escalation in the event of conflict.

Ideally such a force would be able to meet any Chinese action at or near the point of attack--for instance, Taiwan or islands in the East or South China Sea--defeat any such attack using conventional forces acting solely or at least overwhelmingly within a clearly understandable and justifiable geographical boundary, and deter China from escalating its way out of failure through the joint forces' evident ability to meet such escalation with an appropriate combination of military counteraction and cost infliction.

Alternatively, in the event that China gains the upper hand over contingencies about which the

United States cares, an eventuality which we hope does not come to pass but which we must concede may, such a joint force should be designed to expand or shift the boundaries of a war to a level at which U.S. forces have the upper hand, but at which the United States can still plausibly seek to limit further escalation.

Based on this logic, I think it's clear that the United States would be ill-advised to rely exclusively or primarily on indirect approaches, such as blockades or the like, to deter or defeat Chinese military action in the region. People sometimes talk about offshore control or similar such strategies.

At the same time, such indirect strategies should be vital options and components within a broader U.S. strategy that does emphasize direct defense.

So what then does developing such a joint force as I'm outlining mean in practice? Firstly, it means continuing to seek to develop this direct defense force that can prevail over China in plausible contingencies in the Western Pacific. Now this effort is, fortunately, already receiving substantial attention within the Pentagon and from outside experts, such as those also on the panel today.

But I believe that this focus alone is not enough. For these steps to strengthen the Department's direct defense capabilities need to be accompanied by the development and integration of capabilities, strategies, and doctrines for effectively fighting specifically limited wars. This is vital because the capabilities that the Department procures, the way it plans to use them to fight such wars against China, or for that matter Russia, and even the objectives the nation seeks to attain, all of these must be determined in light of the reality that the United States, as well as our allies and partners, will want to keep such a conflict limited.

This reality has potentially major implications for what kinds of weapons the Department buys and what characteristics these weapons should have, what kinds of war plans the Department develops, and what kind of warfighting doctrines it trains its personnel to be ready to implement.

Indeed, if the Department builds a joint force that cannot be used well in a limited war, it will have failed to build the right force for the coming competition with China and will have significantly damaged the nation's deterrent power.

The problem is that the Department is currently ill-equipped to prepare for such limited conflict. A full generation after the collapse of the Soviet threat, much of the U.S. military and the American defense policy world have lost mastery of or even much familiarity with what it means to conduct and manage a limited war.

This risks the United States being unprepared to take on a more powerful and capable PRC, a lack of preparedness that could significantly undermine deterrence or, in fact, worse.

I therefore hope that the Commission will urge the Department and those who influence it to pay greatly increased attention to preparing the joint force and the nation's strategic posture in the Asia-Pacific for how to prevail in a limited conflict. This is the kind of force and posture the nation needs to provide a genuinely adequate deterrent as China becomes increasingly powerful and it appears more assertive.

Thank you very much.



**PREPARED STATEMENT OF ELBRIDGE COLBY  
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**April 1, 2015**

**Testimony before the U.S.-China Economic and Security Review Commission “China’s Offensive Missile Forces: Implications for the United States”**

*Prepared Statement of Elbridge Colby*

*Robert M. Gates Fellow*

*Center for a New American Security*

Vice Chairman Shea, Commissioner Tobin, and other distinguished members of the Commission, thank you for inviting me here today to discuss the implications of China’s growing arsenal of offensive missile forces in the context of its broader military buildup for the United States. The development of these increasingly capable forces by the People’s Republic of China (PRC) poses a growingly significant challenge to the interests of the United States. As the Commission has already received testimony detailing the nature and scope of this challenge, I will focus the majority of my statement on the implications for the United States of this aborning threat and what the United States might do to mitigate, adapt to, and respond to it.

**The Nature and Scope of the Chinese Conventional and Nuclear Offensive Missile Threat**

*Conventional Capabilities*

As is well known, China has been investing substantially since the 1990s in developing a sophisticated arsenal of conventional ballistic and cruise missiles able to strike accurately, rapidly, and with material effect against U.S. and allied bases, vessels, and other targets in the Western Pacific. While the exact impetus for and precise level of progress of this initiative are both difficult to establish with precision, what is clear is that China has been able to develop a highly sophisticated and large missile force and that the challenge it poses to the U.S. military posture in the Pacific is real and increasingly serious.

But while China’s missile arsenal represents one of the – if not the – most potent aspects of its military modernization program, it cannot be viewed in isolation. Rather, China’s missile force needs to be seen in the context of the PRC’s broader effort to develop a high-end conventional military able to contest U.S. military dominance in the Western Pacific and eventually very likely beyond it. This broader military buildup comprises increasingly sophisticated, resilient, and formidable command, control, communications, computers, intelligence, surveillance, and reconnaissance (C4ISR) capabilities; naval and air forces; space and anti-space assets; and a range of other capabilities across the full spectrum of modern military force. While much of the focus of this initiative appears oriented at dealing with a Taiwan scenario, it is increasingly apparent that Beijing’s ambitions have widened or are widening beyond Taiwan. Indeed, the PRC appears to be seeking ultimately to create a zone in the western Pacific within which the military power of the PLA will be able to ensure that Chinese strategic interests are held paramount—in effect, to supplant the United States as the military primate in the region.

Based upon its efforts to date, China has in fact already been able to put together a formidable military, one that can contest U.S. military primacy in the Western Pacific, including in what the People’s Liberation Army (PLA) refers to as “warfare under highly informationized conditions” – or, in more common parlance, modern, high-tech war. Indeed, the median point of contemporary defense expert opinion appears to be that the United States would already face a serious challenge to prevailing against Chinese military power over plausible conflicts in the Western Pacific, especially Taiwan – and that the situation is getting worse rather than better.

And it is the future that is the real problem. This is because the trend lines are worsening from the perspective of the United States and its allies. China's military buildup is continuing apace despite a slowdown in the PRC's overall economic growth even as U.S. defense investment is hobbled by sequestration and its associated spending restrictions as well as by the diffuse but perhaps more significant difficulties Washington finds in focusing its own military modernization efforts on the "pacing" challenge posed by the PRC. These difficulties include the draw of military attention to other regions of interest for the United States, organizational and programmatic inertia in the Pentagon and elsewhere, and, perhaps most perniciously, the simple unwillingness of large swathes of U.S. opinion to believe that U.S. military primacy could actually be seriously challenged. These unfavorable trends, of course, build upon a fundamental geographic conundrum that the United States faces in the Western Pacific: Washington seeks to retain military primacy in the waters and skies just off the Chinese coast, while Beijing seeks to seize the military upper hand in areas just off its shores. China is thus able to seek to exploit the advantages that derive in conventional warfare from proximity, the ability to deploy mass, shorter lines of communication, and a host of other factors.

### *Nuclear Forces*

At the same time as China has been mounting an aggressive buildup of its conventional military, however, the PRC's nuclear arsenal is also becoming somewhat larger and considerably more sophisticated. While China continues to exhibit restraint regarding the size of its nuclear arsenal and in how it appears to think about the role of nuclear weapons in its military strategy, the PRC is nevertheless substantially modernizing its nuclear forces. These improvements include the deployment of more survivable road-mobile intercontinental ballistic missiles armed with multiple, independently targetable warheads and penetration aids designed to defeat missile defenses; the development and gradual deployment of a ballistic-missile submarine force; the fielding of new command, control and communications assets that enable more deliberate and controlled employment; and the marked improvement in training and professionalism among the PLA's nuclear warriors. The Department of Defense conservatively judged in its 2014 annual report to Congress on China's military modernization that "these technologies and training enhancements strengthen China's nuclear force and enhance its strategic strike capabilities" and assessed that China will "implement more sophisticated command and control systems."<sup>144</sup>

While these advances do not at this stage appear to portend an effort by Beijing to "sprint to parity," they do have serious strategic consequences even without such an attempt. That is because, whether deliberately pursued or not, these improvements will by necessity give Beijing more and better options for employing its nuclear weapons, especially in more limited and controlled ways. In the past, China's nuclear forces were considered vulnerable and blunt instruments, messy weapons that would only likely be used at the very top of the "escalatory ladder"—for instance, against the cities of its opponents. Needless to say, this presumably rendered the bar for Chinese nuclear use exceptionally high, an inference fortified by China's oft-trumpeted (if ambiguous and rarely fully trusted) "no first use" policy regarding its nuclear weapons.

But, armed with its new generation of nuclear forces, China will gain options for using them that are more discriminate in nature than those entailing massive strikes against American territory. Instead of only, practically speaking, having the option of striking at a major American or Japanese city, China will increasingly gain the ability to employ its nuclear forces in more tailored fashion—for example, against military facilities or forces, including in the region. This ability to use nuclear weapons in more limited and tailored ways will make China's threats—explicit or implicit—to use nuclear forces more credible.

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<sup>144</sup> U.S. Department of Defense, *Annual Report to Congress: Military and Security Developments Involving the People's Republic of China 2014*, (2014), 28-30, [http://www.defense.gov/pubs/2014\\_DoD\\_China\\_Report.pdf](http://www.defense.gov/pubs/2014_DoD_China_Report.pdf).

The consequence of this is that China's nuclear force will cast a darker shadow over Sino- American competition in the Pacific. Thus, strategists and military planners in the United States and allied countries will need to take the possibility of Chinese nuclear employment in the event of conflict more seriously. This does not mean that China will reach for the nuclear saber early or often. But a more sophisticated force will give China better options for how it might seek to use these weapons not only, as in the past, as a desperate last resort, but also to deter U.S. escalation of a conflict—escalation the United States might need to resort to if it is to prevail.

### **The Strategic-Political and Military Implications of these Developments**

This shift in the military balance driven by China's increasing conventional military capability and its more sophisticated nuclear force represents a major challenge for the United States, which has since the Second World War underwritten its strategy for the Asia-Pacific by military supremacy in maritime Asia.<sup>145</sup> During this era, U.S. forces could, generally speaking, defeat any challenger in the waters of the western Pacific or in the skies over them. This allowed the United States to shape the regional environment in ways conducive to U.S. interests in open commerce and political interaction; sustain alliances with countries like Japan, Australia, South Korea, the Philippines, and Thailand; and prevent Asia from being used as a springboard to challenge broader American interests and security. In brief, military primacy in maritime Asia has been the crucial predicate of broader American strategy in the Asia-Pacific.

A loss of military primacy in this region would, therefore, have profound strategic consequences for the United States and those nations that rely upon it. The United States has seen an open and friendly order in maritime Asia as crucial to its interests at least since Matthew Perry's "Black Ships" opened Japan in the nineteenth century; since the Second World War, it has seen its own military supremacy in the Pacific as the best way to secure and promote that order. If China can attain military dominance or even simply advantage in this area, the world's most dynamic region, then U.S. interests as traditionally understood are likely to suffer, perhaps seriously. It will be Beijing rather than Washington that will serve as the ultimate arbiter of what is and is not acceptable in Asia. It is a reasonable assumption that such a power structure would be considerably less congenial to Washington's interests—let alone those of U.S. allies—than the current order.

It therefore makes sense for the United States to strive to preserve its military advantages in the region. But prudence and realism suggest that we anticipate that the future conventional military balance in the western Pacific between the United States and its allies and partners on the one hand and China on the other will, at the very least, be far more even than was previously the case, and likely will become increasingly competitive. Over time, indeed, the balance may tip against the United States and its allies, at least in certain regions and with respect to particular contingencies about which the United States has traditionally cared.

Even without wholly losing the conventional upper hand in the Pacific, this highly probable shift toward a more even military balance in the region will likely lead to significant changes in the Asia-Pacific. It will likely make China more assertive, since Beijing will be more confident that resorting to military force could pay off for it in regional disputes it cares about, especially if a conflict can be kept relatively limited. We should therefore expect Beijing to be at least somewhat more ambitious and assertive. This point should not be controversial: the notion that greater strength makes one more assertive and ambitious is well demonstrated, both in international politics and in everyday life. Indeed, China's rising forcefulness in its near seas in recent years appears to have been fueled by the nation's general sense of growing power as well

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<sup>145</sup> For an elaboration of these implications with a focus on their impact on the role of nuclear weapons in the Asia- Pacific, see Elbridge Colby, "Asia Goes Nuclear," *The National Interest* (January/February 2015) 28-37, <http://nationalinterest.org/feature/welcome-china-americas-nuclear-nightmare-11891>.

as the expanding inventory of assets available to pursue its ambitions. For instance, China's acquisition of far more developed maritime and oil-drilling capabilities seem to have been playing a major role in Beijing's increased pushiness in the South China Sea.

A more even power balance is also likely to lead to a reordering of alignments and strategic postures in the region. Asian and Pacific states will continually judge the relative strength of the two titans of the Asia-Pacific as well as the pair's respective resolve and future trajectories, and will adjust their own policies and postures accordingly. Indeed, this is already happening. Old U.S. ally Thailand, for instance, has drifted away from Washington and moved closer to Beijing, while old U.S. adversary Vietnam, feeling the PRC's pressure in the South China Sea, has been warming up to Washington.

Taiwan may be the canary in the coal mine for these unfavorable trends.<sup>146</sup> Taiwan's Ministry of National Defense stated in 2013 that the United States would not be able to block a Chinese invasion of the island by 2020. Of course, one might ascribe this judgment to special pleading on the part of Taipei—except that Taiwan's is not an isolated assessment; many defense experts share this view. Yet if the United States loses the military upper hand over Taiwan, it risks opening Taiwan and, to an important degree, itself to the potential for military-backed coercion by Beijing over Taiwan's status. A loss of the ability to credibly protect Taiwan from Chinese invasion or serious coercion could result in loss of confidence in other U.S. security commitments in Asia (and beyond) in the face of growing Chinese power. An outright seizure of Taiwan by China, meanwhile, would present an even more dramatic challenge to U.S. credibility and would also considerably simplify and assist China's efforts to project power beyond the so-called "First Island Chain" in the Western Pacific.

Nor should we expect a shift in the balance with respect to Taiwan to be the end of this trend. Rather, if the United States fails to maintain its edge over China, Beijing is likely to be able to attain practical military superiority in areas of maritime Asia other than Taiwan, and over the long term perhaps well beyond it. Indeed, success in gaining military advantage over a Taiwan contingency is just as – if not more – likely to encourage as it is to satiate Beijing's ambitions.

Assuming that the United States will not concede regional hegemony to Beijing (as it should not), that the United States and its allies will continue to have significant areas of tension and disagreement with an increasingly capable China, and that the United States will remain ready to use military force to defend or vindicate its and its allies' interests in Asia, this means that the United States may come to blows with a power deploying military forces of roughly comparable and, in some circumstances, possibly superior effectiveness. In simpler terms, it means that the outcome of a conflict between the United States and China will be more uncertain and that, if current trends are not redressed, the United States might well ultimately find itself on the losing end of a major military engagement in the western Pacific.

This more competitive military landscape between the United States and China is also likely to make conflict in the region more plausible. War is more likely in situations like this, when both sides think they can prevail, rather than when the prospective winner is clear. The great powers, for example, were more ready to fight in 1914 because each side believed it enjoyed a solid chance of victory. Conversely, a large amount of the stability and comity among the major powers of the post-Cold War world can be traced to a situation of "hegemonic stability"—the evident fact that no other power could venture beyond its own borders to challenge the United States in the years following the 1991 Gulf War. This more stable situation will no longer so clearly hold as resort to force in maritime Asia becomes a more reasonable option for Beijing.

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<sup>146</sup> For an expanded version of this argument, see Elbridge Colby, "Can We Save Taiwan?" *The National Interest*, October 18, 2013, <http://nationalinterest.org/commentary/can-we-save-taiwan-9257?page=show>

If war does happen, then, the United States will have to fight much harder and under more stressing conditions than it would have in the past to prevail against China. This is well known and there has been ample work detailing the difficulties China's growing strength would impose on the U.S. military as well as suggestions for how the United States might overcome them.<sup>147</sup> Indeed, the Pentagon itself appears increasingly and commendably seized with grappling with this problem. Through initiatives such as the Department's new "Offset Strategy" initiative, the Pentagon rightly appears to be focused on maintaining American advantages in the effective projection of conventional military force even in the face of a resolute and highly capable opponent like Beijing. This effort by the Department deserves to be lauded, supported, and encouraged, since it represents precisely the kind of effort to retain the conventional upper hand through using cost-efficient means that the United States should be undertaking.

### **The Growing Salience of Nuclear Weapons**

Considerably less remarked upon than the difficulties the United States would face in a conventional conflict with China, however, is that, in the event of such a war between the United States and China, nuclear weapons are more likely to be implicated than they had been in the past. This is true because war in the region between the United States and China under circumstances of even rough conventional parity will be more susceptible to nuclear escalation. In the past, most defense analysts and planners envisioned a Sino-American conflict in maritime Asia starting and remaining a conventional fight. Given the PLA's very modest capabilities for such a contingency, the United States was seen as able to handle any Chinese attempts at power projection solely by relying on U.S. conventional forces and with relatively limited requirements for vertical or horizontal escalation.

In practical terms, the United States would have been able to defeat Chinese attacks on Taiwan or other such plausible beneficiaries of American defense with relatively limited means and on Washington's terms. Nuclear weapons, if they were to become involved, were seen as most likely to be introduced in limited numbers by the Chinese in a desperate attempt to stave off defeat in a Taiwan contingency, a defeat that might jeopardize the legitimacy of the Communist regime. But the threat to resort to such usage was seen as of limited credibility and actual employment along these lines of minimal effectiveness in light of substantial American advantages in the quality and quantity of the conventional and nuclear forces it could use to conduct such a limited nuclear war.

But we will be moving into a world in which the basic assumptions that determined such assessments no longer hold. That is because future efforts to defeat Chinese attempts at power projection will not be so easily handled, especially without our needing to resort to vertical or horizontal escalation to prevail. In any contingency in the region, the growing sophistication of China's large military will mean that the United States will have a much more difficult time overcoming it, since Chinese systems that have longer range, are more accurate, are smarter and are more effectively netted together require more work, creativity and skill to defeat. Put more directly, the United States and its allies will have to fight harder, quicker, nastier, deeper, for longer, with less deliberation and over a wider battlefield than was the case in the past in order to defeat Chinese forces in maritime Asia.

For example, in the past, the United States might have designated Chinese fixed ballistic missiles of limited range and accuracy based on or near the coast for attack by aircraft operating safely with excellent and secure information later in a campaign. In the future, however, the United States might have to designate Chinese mobile ballistic missiles of longer range and better accuracy based farther in the country's interior for attack by aircraft operating perilously with limited information early in a conflict. So, for instance, if

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<sup>147</sup> See, for instance, the pathbreaking, foundational study by CSBA on a potential AirSea Battle campaign by Jan van Tol et al, "AirSea Battle: A Point-of-Departure Operational Concept," (Center for Strategic and Budgetary Assessments, May 18, 2010), <http://csbaonline.org/publications/2010/05/airsea-battle-concept/>.

Taiwan's Ministry of National Defense is right that China will have the upper hand in a battle over Taiwan by the 2020s—but the United States still wants to deter or defeat an attempted Chinese invasion of the island—the United States may well need to be willing to hit targets deeper in China than had been envisioned before, strike sooner and expand the war considerably beyond the island's immediate environs in order to compel Beijing to back away from seizing Taiwan.

Even without anyone really wanting to introduce nuclear weapons into the equation, then, these trends raise classic “inadvertent escalation” risks. This line of analysis points to the dangers of escalation that can arise due to the way even a conventional war can unfold. In particular, if one needs to fight harder against an opponent in order to prevail, it also becomes harder to limit the war—including in ways that might entangle nuclear weapons. For instance, U.S. efforts in the event of conflict to strike at Chinese command-and-control nodes, missile bases and systems, surveillance and intelligence assets, and the like, even if intended only to affect the nonnuclear balance, might well implicate nuclear weapons. This might be because such assets or capabilities might be collocated with nuclear forces or themselves have dual nuclear and conventional roles, because the Chinese might fear such hard-hitting attacks are a prelude to decapitation, or because the Chinese might misread conventional strikes as nuclear attacks. In the fog of war, any number of such dynamics could push toward consideration of nuclear use.

Nor would nuclear weapons necessarily be introduced into a potential Sino-U.S. conflict solely by China. Rather, it could well be the United States that elects to do so – and, in peacetime, to signal its willingness to do so in wartime for deterrence and assurance purposes. This willingness on the part of the United States stems from the unfortunate fact that Washington may lose the conventional military advantage it has historically enjoyed over China in maritime Asia. Such a loss would most plausibly be partial—China would be unlikely to seize whole the conventional upper hand in the region. But, having gained the advantage over some parts of the western Pacific, Beijing might, for example, attempt to force the United States into a situation in which Washington would be unwilling to take the necessarily escalatory steps to overcome or push back Chinese attacks. For instance, Beijing might gain conventional superiority around Taiwan and be able to block U.S. efforts designed to defend the island. In such a case, the United States might need to broaden the war, possibly by striking targets further into China and of greater value to the PRC's leadership, in order to persuade Beijing to agree to terms acceptable to Washington. The plausible threat of a limited Chinese nuclear response would prove a substantial disincentive to pursuing such a course.

A loss of U.S. conventional advantages in maritime Asia could come about because of a U.S. lack of resolve or inattention, because of the scale and effectiveness of China's substantial and ongoing military buildup, or because of some malign combination of both. Such a shift in the balance is more plausible in the foreseeable future regarding the western portions of the Pacific, but this apparent narrowing of the problem actually offers little comfort since the western Pacific is home to Japan, South Korea, Taiwan and the nations of Southeast Asia, and is the eastern gateway to the Indian Ocean and the Persian Gulf. Losing military primacy and thus regional strategic leadership there is hardly compensated for by preserving it over the Samoan Islands.

Moreover, military primacy lost in the western Pacific is just as likely to be simply a stage on the way to further erosion as it is to be the terminus of a shift in the military balance.

In the event that the United States does lose its conventional advantage, Washington may well seek to rely on its own nuclear weapons to compensate for outright inferiority or for the inability of its conventional forces to fight back in a way sufficiently controlled to suit U.S. interests in limiting a conflict. This reliance would, in effect, be a return to U.S. policy during the Cold War, when Washington relied on its nuclear forces to offset Soviet conventional superiority in Europe.

In particular, Washington would likely seek to exploit its superior ability to conduct a limited nuclear war to deter China from taking advantage of its conventional lead.

Nor would this be likely to be a unilateral move on the part of the United States. Rather, it is reasonable to expect that beneficiaries of U.S. security guarantees would press for Washington's clearer and more emphatic adoption of such an approach. Even in a far more congenial security environment than the future sketched here, U.S. allies like Japan, South Korea and Australia have been insistent that the United States reaffirm that Washington's security guarantee ultimately is rooted in its commitment to use nuclear weapons to defend them. If the Chinese are able to develop not only the A2/AD capabilities but also the strike and power-projection assets needed to overcome U.S. conventional superiority, it seems reasonable to expect that U.S. allies will urge Washington to substitute for that conventional deficit with the nuclear force they already see as vital to their security.

### **The Possibility of Proliferation**

This course will seem unappealing to many, not least in the United States, given the risks it will entail for Americans. But this disquiet points to another potential implication should China gain military primacy in the Western Pacific: the prospect of further nuclear proliferation in the region. If, as China grows stronger and more assertive, its conventional military power begins to outweigh that of the United States in maritime Asia, and that shift is not met by a greater U.S. reliance on its nuclear forces or some other effective countervailing steps, then those countries of Asia traditionally allied to or reliant upon Washington—countries that cannot hope to match China's strength at the conventional level—may ultimately see getting their own nuclear weapons as essential to deterring China's exploitation of its growing strength.

It is worth emphasizing that this will *particularly* be the case if these nations view a weaker United States as lacking the resolve or the ability to use its nuclear weapons on behalf of its allies, since in such a case they will be exposed to Chinese coercion. This is no fantasy; polls in South Korea already show substantial support for an indigenous nuclear-weapons program, and South Korea, Japan, Australia and Taiwan have pursued or seriously contemplated pursuing their own nuclear arsenals in the past and might do so again. In other words, in such a scenario a cruel dynamic will take hold in which diminishing U.S. conventional advantages will lead to pressure for greater emphasis on nuclear forces, but, in light of China's own advancing nuclear capabilities, such reliance itself will be decidedly less attractive.

The loss of U.S. conventional advantages would leave Washington with a series of unpalatable options. Relying more on nuclear weapons might raise the costs and risks of conventional war with China and thus fortify deterrence, but those costs and risks would increasingly redound not only against the PRC but also against the United States and its allies. Ignoring or refusing to confront the nuclear implications of China's growing conventional advantages, on the other hand, would increase the impetus toward proliferation among Washington's allies and partners.

Such developments would put enormous pressure on what has been, since the end of the Cold War, a relatively easy dual pursuit of credible extended nuclear deterrence and nonproliferation. In the unipolar era, one policy served the other, and neither was very risky or costly. But during the darker days of the Cold War, there were bitter debates about whether the risks that extended deterrence involved for the United States were worth the benefits of nonproliferation. After the collapse of the Soviet Union, those debates effectively vanished. But as China grows stronger, it will be harder and riskier for the United States to credibly extend nuclear deterrence against Beijing to U.S. allies—perhaps much harder—which will mean that using it to forestall proliferation will also be harder and riskier. The greater the danger posed by China's military and the broader its ambitions, the less plausible it is that Washington will be able to—or will want to—serve both masters. Thus, the more threatening and ambitious Beijing appears, the less



likely it is that the strategic and nuclear order of the Asia-Pacific will endure.

### **Recommendations for U.S. Policy**

In light of this analysis, it is reasonable to judge that China's growing military power poses a major – and probably the most significant – challenge to U.S. military primacy and ultimately to the nation's legacy national security strategy in the coming years. What, then, are we to do about it? The best way for the United States to mitigate the negative implications of rising Chinese military power is relatively simple: to maintain its military advantage in the Western Pacific. Such superiority is the most reliable way to convince any leadership in Beijing that attempts to use its newfound military power for aggressive purposes would be futile, costly, and unwise, and thus to ensure Beijing's respect for the interests of the United States and for those of its allies and partners. Put another way, it is the best way to effectively balance China's growing military power.<sup>148</sup> But, because of China's growing wealth and sophistication as well as its evident resolve to continue building up a more formidable military that can challenge U.S. supremacy in the region and ultimately perhaps beyond, this is an illustration of the old dictum that strategy is simple but very hard.

It is crucial, nonetheless, to try to maintain such advantage where feasible, as even a diminished margin of strength is preferable to losing all such advantage. The pressing question is, however, how to do so in a way that is feasible, sustainable, and practical. In all candor, though, there do not appear to be clean “solutions” to this daunting problem. Rather, there are steps that can mitigate and limit the malign effects of China's growing strength and minimize the decline of American relative military advantage, steps oriented around maintaining and, where the U.S. legacy posture is being rendered obsolete by China's buildup or technology, building anew a military position in the Asia-Pacific that is potent, credible, and adapted to the potential conflicts with the PRC that plausibly could arise. These steps are crucial not only in the event of conflict but equally for preventing such a conflict on terms acceptable to the United States and its allies. Deterrence, after all, derives most clearly and reliably from an evident ability to use force and to use it effectively and decisively.<sup>149</sup>

It therefore makes sense for the United States to dedicate itself to maintaining what military primacy it can in the Asia-Pacific. But what does maintaining such military primacy actually mean? And what does that conception entail?

*What it means is the ability to fight a limited war in the Western Pacific better than China can. Why? The defining aspects of the strategic problem for the United States in this region are China's growing military power and its increasing ability to escalate against the United States and its allies and partners in ways that negate their military capabilities or cause them grave harm.*

This means both that the United States and its affiliates will find it harder to defeat China and control escalation in ways they prefer and that they will be increasingly vulnerable to serious attack by the PRC. Given the fact that the stakes in any conflict in the Western Pacific are, by definition, important but still nevertheless partial for the United States, Washington as well as its allies and partners will have a strong interest in limiting the destructiveness of any conflict with China. Needless to say, China will also have immense incentives to limit a conflict with the United States, given the enormous damage that it could wreak on the PRC.

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<sup>148</sup> For an excellent argument along these lines, see Ashley Tellis, “Balancing Without Containment: An American Strategy for Managing China,” (Carnegie Endowment for International Peace, 2014), [http://carnegieendowment.org/files/balancing\\_without\\_containment.pdf](http://carnegieendowment.org/files/balancing_without_containment.pdf).

<sup>149</sup> For an excellent recent article on how to think about conventional deterrence in the context of China, see Jonathan Solomon, “Demystifying Conventional Deterrence: Great-Power Conflict and East Asian Peace,” *Strategic Studies*



This means that, in any conflict with the PRC, both sides will almost certainly want to limit the war. Within this context, the United States and its allies and partners will want to seek to *favorably* limit the war in ways that both protect themselves *and* that allow them to prevail. Put another way, because the United States and its affiliates are unlikely to enjoy untrammelled military dominance over China in the coming years, they must therefore find ways to retain or gain *escalation advantage* over Beijing. In simpler terms, the United States and its allies and partners must be *better at limited war* than China. Being better at limited war basically means being able to shape a conflict in such a way that an adversary will accept some sort of defeat (albeit a limited one) rather than elect to resort to his ability to escalate further.

The best way to accomplish this difficult objective is for the United States to ensure that the boundaries which both sides and third party observers accept as the established parameters of a limited conflict are ones within which it can prevail, and that the United States and its affiliates have the forces, strategies, and doctrines available to achieve their (necessarily limited) aims within those bounds.<sup>150</sup> In such a context, the United States should seek to push the onus of escalation – the burden of continuing and expanding the war – onto Beijing’s shoulders. In essence, the point would be to overcome China within the confines of a limited, bounded conflict and then force Beijing to bear the risk, the opprobrium, and the culpability for expanding or intensifying the war. Given that Beijing would have abundant reasons to want to limit any such war with the United States and its allies and partners, shifting the burden of worsening a conflict onto the PRC would be a very significant strategic gain. In such an event, the United States would not need to rely on Beijing’s good graces for it to make such a decision. Rather, the United States’ own reserve capabilities – including, in the extreme case, its nuclear forces – would form a powerful deterrent against China seeking to escalate its way out of defeat.

This logic dictates that the United States think carefully about the parameters it would promote and agree to in the event of conflict with China. These parameters would need to be plausibly acceptable boundaries of limitation not only for Washington but also for Beijing while at the same time allowing the United States and its allies and partners to exploit their advantages.

But this logic also has significant implications for the kind of military force the United States should procure and the kind of doctrine and strategies it should develop. In particular, it means having a joint force that can prevail in a limited context – that does not, in other words, rely on escalation that would be foolhardy or ineffective – while retaining substantial advantages should the conflict escalate to higher, wider, or more intense levels of conflict. This latter part is crucial not only in deterring Chinese escalation but also because the United States itself may be the party that wants to escalate, especially as China grows stronger.

This logic dictates that the United States should develop a joint force that can contest and, ideally defeat, Chinese aggression through a “direct defense” approach; supplement or backstop that direct approach with indirect strategies; and that together is designed to allow the United States to favorably control escalation in the event of conflict. Ideally, such a force would be able to meet any Chinese action at or near the point of attack (for instance Taiwan or islands in the East China Sea), defeat the attack using conventional forces acting solely or at least overwhelmingly within a clearly understandable and justifiable geographical boundary (one that might well include Chinese territory, given its vital role in such an attack), and deter China from escalating its way out of failure through the joint force’s evident ability to meet such escalation with an appropriate combination of military counteraction and cost-infliction. Alternatively, in the event that China gains the upper hand over contingencies about which the United States cares, such a force should be designed to expand or shift the boundaries of a war to a level at which U.S. forces have the upper hand but at which the United States can still plausibly seek to limit further escalation. In this

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<sup>150</sup> Such boundaries might and likely would be defined in terms not only of geography but also or alternatively in terms of classes of weaponry, intensity of conflict, types of targets, and so forth.

eventuality, U.S. reserve (including nuclear) forces should provide a credible block to Chinese counter-escalation and in particular to unchecked Chinese aggression, especially should U.S. and allied defenses break down over truly crucial interests.

Based on this logic, it is clear that the United States would be ill-advised to rely exclusively or primarily on “indirect” approaches such as blockades or the like to deter or defeat Chinese military action in the region. Such forces would be ill-suited for enabling the United States to prevail in limited wars with China because they would likely be either insufficient to coerce Beijing into backing down or too escalatory. In the former possibility, indirect approaches would cause pain for Beijing but would be too mild to persuade it to back away from the military action – say, over Taiwan or islands in the East or South China Seas – that had prompted the United States to resort to them. Alternatively, if such indirect approaches were sufficiently harsh, they would risk broadening or expanding conflicts that could otherwise remain limited, an expansion that could very well undermine U.S. interests in containing such a war. Indeed, precisely by reducing the flexibility of the U.S. joint force, reliance on such approaches might actually spur escalation. More realistically, plausible U.S. leaders would likely be loath to implement such escalatory strategies and China would be able to shape its strategic and military actions to avoid triggering them.

At the same time, such indirect approaches should be vital *options and components* in U.S. strategy. For instance, the United States should aggressively exploit the possibilities for indirect strategies such as blockade, maritime denial, and the like, and the United States might well elect to implement these options in the event of conflict. The crucial point is that these strategies should not be the *exclusive* or even necessarily primary mode by which the United States would respond to Chinese military action in maritime Asia. Rather, the force the United States should seek to develop should focus firstly on seeking to defeat such Chinese action directly and rely on these indirect strategies as supplements to such direct responses or as methods of escalation.

So what does developing such a joint force mean in practice?

Firstly it means continuing to seek to develop a “direct defense” force that can prevail over China in a limited war. As noted above, this effort is already receiving substantial merited attention, both within the Pentagon and from outside experts.<sup>151</sup> The Department of Defense should be encouraged and supported in this endeavor, including with respect to initiatives vital for fielding an effective direct defense force such as the next-generation bomber, upgrades to the joint force’s C4ISR architecture, an active submarine building program, the development of a more resilient and adaptable basing structure in the Asia-Pacific, providing the joint force with higher stocks of munitions, among others. The Department should be particularly encouraged to exploit the opportunities afforded by new technologies, which it is already doing through its “Offset Strategy” initiative. Given organizational conservatism, however, efforts to take advantage of the potential of new technologies, particularly unmanned and autonomous systems and novel approaches to missile defense, deserve particular backing.<sup>152</sup> The United States will clearly need to find

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<sup>151</sup> For superb statements for why the United States should maintain a “direct defense” posture in the Western Pacific and strong ideas for how to do so, see Evan Braden Montgomery, “Contested Primacy in the Western Pacific: China’s Rise and the Future of U.S. Power Projection,” *International Security*, 38 no. 4 (Spring 2014): 115-149; David Ochmanek, “Sustaining U.S. Leadership in the Asia-Pacific Region: Why a Strategy of Direct Defense Against Antiaccess and Area Denial Threats is Desirable and Feasible,” (RAND, March 2015), [http://www.rand.org/content/dam/rand/pubs/perspectives/PE100/PE142/RAND\\_PE142.pdf](http://www.rand.org/content/dam/rand/pubs/perspectives/PE100/PE142/RAND_PE142.pdf); and James B. Thomas and Evan B. Montgomery, “Developing a Strategy for a Long-Term Sino-American Competition,” in *Competitive Strategies for the 21<sup>st</sup> Century: Theory, History, and Practice*, ed. Thomas Mahnken, (Palo Alto: Stanford University Press, 2012), 257-274.

<sup>152</sup> On this point, see Robert O. Work and Shawn Brimley, “20YY: Preparing for War in the Robotic Age,” (Center for a New American Security, January 2014), [http://www.cnas.org/sites/default/files/publications-pdf/CNAS\\_20YY\\_WorkBrimley.pdf](http://www.cnas.org/sites/default/files/publications-pdf/CNAS_20YY_WorkBrimley.pdf); Paul Scharre, “Robotics on the Battlefield, Part 1: Range, Persistence and Daring,” (Center for a New American Security, May 2014), <http://www.cnas.org/sites/default/files/publications->

asymmetric ways to “offset” Chinese advantages in proximity and mass, and thus it is vital that the Department effectively exploit the potential latent in technology and in its effective integration into highly-skilled and relatively adaptable U.S. military organizations.

Sustained support for these programs and initiatives is crucial. But it is not enough. For these steps need to be accompanied by the Department’s development and integration of capabilities, strategies, and doctrines for effectively fighting limited wars. This is a problem because the Pentagon – and much of the American policymaking and policy-influencing community – have become accustomed to the United States being able to wage wars in which it alone can set the parameters of conflict. A full generation after the collapse of the Soviet threat and after a period in which most U.S. military attention went towards “rogue” states and terrorist or insurgent groups, much of the U.S. military and the American defense policy world have lost mastery of or even much familiarity with what it means to face a highly-capable opponent able to contest seriously U.S. dominance of the battlespace.

Yet China will increasingly present precisely this kind of challenge. It is therefore critical that the Department work to develop a much firmer understanding of limited war, escalation, brinksmanship, and related concepts and acculturate its officers and officials, especially those in the rising generation, with these concepts and their implications. This is vital because the capabilities the Department procures, the way it plans to use them to fight wars against China (or, for that matter, Russia), and the objectives it seeks to attain – all of these must be determined in light of the reality that the United States will want, indeed will need, to keep the conflict limited. This reality has implications for what kind of weapons the Department buys and what characteristics these weapons should have, what kinds of war plans it develops, and what kinds of warfighting doctrines it trains its personnel to be ready to implement. Importantly, it does not always mean excluding or disfavoring capabilities or approaches that risk escalation – since risking escalation is often necessary to prevail in a limited conflict – but it does mean that those risks must be understood and accounted for. In simpler terms, *if the Department builds a joint force that cannot be used well in a limited war, it will have failed to build the right force for the coming competition with China and will have significantly damaged the nation’s deterrent power.*

Modernization of U.S. nuclear forces should play a crucial role in this effort to build a joint force designed for prevailing in a plausible conflict with China. Nuclear forces will form a vital component of an effective limited war strategy for the United States by deterring Chinese resort to nuclear escalation of its own or, in the event the United States loses the conventional upper hand, by deterring dramatic forms of PRC non-nuclear escalation. To perform these missions most effectively, however, the U.S. nuclear force needs to be adapted to the emerging strategic and military-technological context. This means that, while the U.S. nuclear deterrent should continue to be developed and postured to deter general nuclear war, it should also have greater capabilities for discrimination and control such that it can be employed in tailored fashion. In other words, the U.S. nuclear force too should be designed to be better at limited war than its Chinese opposite.

Accordingly, the U.S. nuclear force should be adapted to have as much discrimination and tailoring potential as possible, since the more it exhibits these qualities the more effective it would be in a limited war scenario. And, given that the parameters of such a limited war cannot be precisely envisioned in advance, this means that the U.S. nuclear force should be endowed with as much controllability and flexibility as possible in terms of level of destructiveness, accuracy, radioactive release, utility against various targets, and redundancy. Such versatility would give the United States a greater ability to employ these forces to gain escalation advantage over China in the event of a conflict – and, more to the point,

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[pdf/CNAS\\_RoboticsOnTheBattlefield\\_Scharre.pdf](#); and Paul Scharre, “Robotics on the Battlefield, Part 2: The Coming Swarm,” (Center for a New American Security, October 2014), [http://www.cnas.org/sites/default/files/publications-pdf/CNAS\\_TheComingSwarm\\_Scharre.pdf](http://www.cnas.org/sites/default/files/publications-pdf/CNAS_TheComingSwarm_Scharre.pdf).

demonstrate to China the futility and great danger of electing to use its own nuclear weapons or cross other U.S. red lines.<sup>153</sup>

U.S. arms control policy and commitments should also be adapted to conform to this emerging strategic environment and the approaches it will require from the United States. Broadly speaking, the United States should pursue an active arms control agenda with China for a number of reasons. Such an active approach can, done well, reduce the incentives to and pressures for war and thus contribute to U.S. and allied security. It can also demonstrate the genuineness of U.S. interest in reducing such risks, which is crucial for maintaining the legitimacy of the U.S. posture in the region among allies, partners, “fencesitters,” and other influential countries. It is important that the United States be seen as meaningfully seeking to control and reduce risks. An arms control agenda is one of the best ways to do so. Even if it bears little fruit in terms of concrete agreements with the PRC, a genuine effort will still be useful in demonstrating U.S. good will and sense of responsibility.

But such an arms control agenda should be strategically sensible rather than oriented towards pursuit of implausible and likely unattractive goals like a world without nuclear weapons. Accordingly, U.S. arms control vis a vis China should be oriented at promoting stability, developing mutual confidence where appropriate, and enabling each side’s better understanding of the other’s strategic approach and intentions to lessen the chances of misunderstanding or miscalculation.<sup>154</sup>

In the particular case of the Intermediate-Range Nuclear Forces (INF) Treaty, the United States should closely examine the implications this Treaty has on the U.S. ability to deploy the military capabilities it needs for effective deterrence and defense in the Asia-Pacific. This means that the Department of Defense should be tasked with rigorously studying whether the United States would materially benefit from being able to deploy INF-accountable systems in the region and, if so, to what degree. While the United States benefits from Russian adherence to the INF Treaty, those benefits must be weighed against the costs of U.S. adherence with respect to the U.S. military position in the Asia-Pacific (and elsewhere). While the United States has historically been able to meet its military requirements in what is, after all, a primarily maritime region with air and sea forces not covered by INF, that could change. If the United States does determine that INF-accountable forces would be important for its posture in maritime Asia, this determination should materially influence decisions as to whether to continue adhering to the Treaty, decisions that would of course also be appropriately influenced by Russian violations of the accord, allied perspectives, and a range of other factors.<sup>155</sup>

Working more effectively with allies and partners will play a particularly important role in developing the kind of strategic and military posture required to balance a rising China in the Asia-Pacific. Given the scale of the PRC’s growth and of the resources it can dedicate to its military, the United States and its allies and partners in the region need to cooperate more and integrate their forces and plans more effectively. No

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<sup>153</sup> For a further elaboration of this argument, see Elbridge A. Colby, “The Need for Limited Nuclear Options” in *Challenges in U.S. National Security Policy: A Festschrift Honoring Edward L. (Ted) Warner*, ed. David Ochmanek and Michael Sulmeyer, (RAND, 2014), 141-168, [http://www.rand.org/content/dam/rand/pubs/corporate\\_pubs/CP700/CP765/RAND\\_CP765.pdf](http://www.rand.org/content/dam/rand/pubs/corporate_pubs/CP700/CP765/RAND_CP765.pdf). For further suggestions for what this type of approach should mean for the U.S. nuclear force, see the author’s contribution to the forthcoming report on future nuclear strategy and posture in Clark Murdock, Samuel Brannen, and Angela Weaver, “Project Atom,” (Center for Strategic and International Studies, 2015), unpublished paper.

<sup>154</sup> For further elaboration of this, see Elbridge Colby, Abraham Denmark, and John Warden, “Nuclear Weapons and U.S.-China Relations: A Way Forward,” (Center for Strategic and International Studies, March 2013), <http://csis.org/publication/nuclear-weapons-and-us-china-relations>.

<sup>155</sup> Elbridge Colby, “The Real Trouble with Russia: Moscow Might Have Violated the Intermediate-Range Nuclear Forces Treaty—Here’s How to Respond,” *Foreign Affairs*, April 7, 2014, <http://www.foreignaffairs.com/articles/141106/elbridge-colby/the-real-trouble-with-russia>.

longer will they be able to afford the luxury of relying only on U.S. forces.

This has different implications for different allies and partners. In the cases of Japan and Australia, for instance, both of which can deploy forces of the highest caliber and are relatively aligned with Washington on regional issues, the United States should continue to look to integrate with their forces as much as possible to share burdens as well as to capitalize on opportunities for specialization. For countries such as the Philippines, on the other hand, the United States should look to increase their capacity for self-defense and to be able to contribute to hampering China's ability to effectively project military force in the region. Finally, in the case of countries less inclined to overt cooperation with Washington, the United States should look to help orient and build their military capabilities to present greater difficulties for China's ability to use its military power in the region.<sup>156</sup>

Thus, while the United States should not place itself in a position in which its plans would be nullified by an ally's refusal to join in a military campaign, it nonetheless should look to help Asian states concerned by China's growing military power and increasing assertiveness to build up the capabilities to deter and, if necessary hamper, delay, or even block an attempt by Beijing to employ or project this power.

## Conclusion

Needless to say, these are only a few of the issues the United States will confront in the face of China's growing military power. But they hopefully offer a useful framework for understanding the implications of this tremendous fact and what the United States might do to mitigate its deleterious effects.

Some, however, will question the advisability of taking the steps recommended here in light of China's future – some will say because China will grow too strong and thus that such efforts will be futile and fecklessly provocative, others because the PRC will be too weak, and thus that such efforts will be unnecessary and wasteful. But it is reasonable to judge that seeking to develop the kind of force and overall posture recommended here is responsible because, while doing so will be neither easy nor cheap, such an effort will pay off regardless of China's future trajectory. If China's economic growth flags somewhat and regresses to the norm of middle-income countries, as seems most probable, then in a long-term competition with this still waxing but more "normal" China a stronger United States with a highly capable force adapted for a major but limited war with China will be well-positioned to favorably sustain its strategic posture in Asia and retain the advantage across substantial and important swathes of the military balance. Such a posture will serve as a crucial balancer to China's growing power and as a major shaper of its strategic behavior. If China, however, is able to sustain exceptionally high levels of economic growth and dedicate ever larger portions of its growing resources to its military, then the United States will, by having made its defense posture stronger and more credible, put itself in a bargaining position of strength rather than weakness vis a vis a mightier Beijing. This will enable the United States to press for better strategic and political terms in the Asia-Pacific in the event China evolves into a hegemon or quasi-hegemon. And if China's economic growth radically slows and/or it elects to slow or halt its military buildup, then the United States may have overspent on strategic insurance, but it will have fielded a military that will continue to dominate the world strategic landscape and thus enable the United States to continue playing its role as benevolent primate.<sup>157</sup>

In other words, our maintaining a position of military strength and, ideally, advantage makes sense across the spectrum of likely futures for China. Of course we cannot know the future with any confidence, but what seems clear is that we will not regret being stronger in it. But this is easier said than done, and we do

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<sup>156</sup> For more on this, see the forthcoming CNAS report, Ely Rather et al., "More Willing and Able: Charting China's International Security Activism," (Center for a New American Security, 2015), unpublished paper.

<sup>157</sup> For a further elaboration of this argument, see Elbridge Colby, "Pushing Back on China: A Rational Approach," The Strategist: The Australian Policy Institute Blog, February 13, 2014, <http://www.aspistrategist.org.au/author/elbridge-colby/>.

not help our cause by delaying or equivocating.

### PANEL III QUESTION AND ANSWER

VICE CHAIRMAN SHEA: Well, thank you all three witnesses for your very informative testimony.

I'll start with a question. In the past few years, we've seen China expel Philippine forces out of the Scarborough Shoal, following an agreement where things were supposed to be worked out. We've seen the Chinese Navy or Coast Guard with Navy ships backing them attempting to block the resupply of Philippine Marines in the Second Thomas Shoal. We've seen the oil rig, of course, in Vietnam's EEZ. We've seen the planes and ships around the Senkakus. We've seen the establishment of the ADIZ in the East China Sea. We see the building of--what--five or six islands in the Spratlys.

Is it fair to say that Chinese developments that you've all, all three of you have spoken about, in terms of missile development, taking advantage of the sensor revolution, have allowed, have enabled these actions to take place?

That's the first part, and then is the United States' response or lack of response to these actions encouraging this type of activity? And at some point, does the United States have to say you've--I hate to use the words "red line"--but you've sort of tripped over something here that we're going to react to?

Anybody want to handle that? Robert?

MR. HADDICK: Vice Chairman Shea, I certainly agree with the sentiments that you've just said there. I see the Chinese strategy having two components. The first component, the offensive component, is actually the subtle component. It's the so-called "salami slicing," the slow accumulation of territorial, maritime territorial gains, and so forth, sliced off in small enough pieces that they are not considered by the international community to be a casus belli, and that is the method that China is using to accumulate its maritime territorial ambitions.

The defensive component, the second component, and the defensive component of their strategy, is the build-out of the anti-access/area-denial battle networks and capabilities with the concept being to use those A2/AD capabilities to then defend the gains that they've accumulated with the salami-slicing offensive part.

This is--this approach seems to be flummoxing policymakers not only in the United States but elsewhere in the region, and these policymakers are trying to figure out how to respond to this clever strategy.

I think a response, one way to achieve leverage over China to push back against salami-slicing is at this point with a diplomatic/political/media/information/propaganda-type approach, which I think is their vulnerability right now. The small countries in the region can portray themselves as being picked on by the larger stronger bully, and if they exploit this sort of media/information/diplomatic line of effort, make greater efforts in that regard, that can be the beginning of a strategy to push back against at least the salami-slicing component of China's strategy.

VICE CHAIRMAN SHEA: Have anything to add or--? I mean the question, this is all, this salami-slicing strategy has been enabled by the developments in the military that you've described; is that fair to say? To me, in my view, the U.S. is encouraging it by not doing more to push back. And that doesn't necessarily mean military, but maybe a ship in the distance as the Philippine Navy resupplies the marines in the Second Thomas Shoal would be a, send a signal, but that's sort of what I was driving at.

DR. MONTGOMERY: I would tend to agree, and I would just echo the point that Mr. Haddick made, which is, given the behavior that's been happening in the East and South China Sea that we tempt to lump under the rubric of increased Chinese assertiveness, it's very much on the low end of the spectrum, what the Japanese call or refer to as "gray zone" situations, and we tend to view those, I think, separately from the high-end military buildup that's captured by the A2/AD capabilities, but they are interrelated.

Now whether that's part of a deliberate strategy on China's part or fortuitous for them, I wouldn't say, but, nevertheless, it's clear that there's an interactive effect between the two.

MR. COLBY: Well, Vice Chairman, I think I agree with what you're saying. I mean just to start off on the first point, I think actually the Vietnam rig is almost a perfect illustration of capabilities enabling intent. You know obviously for a long time the Chinese were sort of assessed to be relatively



content in their, in the great, in their great, their great national space, but as they've developed more capability to project power, even if thus far relatively modestly, you see in the Vietnam example the ability has been in some sense maybe the father of the wish, and I think that's probably a harbinger of things to come.

And this is--I'm not by any stretch an expert on China's leadership, but I have been in the room when I've heard from people who genuinely are, and I think that their sense and my casual even reading of the news in the last few years suggests this is true, is that the Chinese see right now, the contemporary moment, as a propitious moment to push.

The way my colleague Ely Ratner and I have kind of talked about it is the Chinese seem to feel that they're in a situation where they can rock the boat and the Americans will worry about righting it, that we want to automatically deescalate not even a crisis but an uncomfortable situation, and, of course, especially given Mr. Haddick's characterization, I think rightly, the salami slicing tactics, you keep pushing forward. And that's gotten them thus far, and, of course, now they're building islands in the South China Sea and so forth.

And I think the other point is they're doing this, and they still think they're weaker. That's the point that I kind of come back to, but the military balance and the general balance of power in the Pacific is shifting in their direction unfortunately, and that concerns me because if they are acting this way when they continue to think that the military balance tells against them, well, then how are they going to behave when it's more and more in their favor?

So I think one of the answers to this is certainly trying to maintain the military advantage, the point that I made in my oral testimony. But also I think right now is actually a quite important time perceptually and politically in the sense that I think a lot of kind of fence-sitter countries, allies, but also countries like the Indonesias and the Malaysias of the world, are saying is the United States going to stick in the region and kind of be the sort of steel in the backbone because if not, accommodation might be the right choice. But I think--so I would hope that the government would, the U.S. government would take a more focused and risk acceptant position--

VICE CHAIRMAN SHEA: Risk what?

MR. COLBY: Risk acceptant, which sort of understanding the--

VICE CHAIRMAN SHEA: Acceptant. Willing to take a little bit of a risk.

MR. COLBY: Yeah. Understanding if the Chinese are going to push that we're not going to let them take chips off the table just because they're willing to potentially raise the stakes.

And I think one part of this that sometimes gets underestimated is that I think a lot of our leaders go to Asia and they talk about other regions. Asia is the center of the global economy, and it's going to be increasingly central in world affairs, and I think when our leaders go to Asia, they should be thinking about Asia primarily. Of course there are global problems and there's relevance to what's going on in Iran and Russians, without question, but I think part of that is just simply getting Asia the attention that it's due.

VICE CHAIRMAN SHEA: Thank you.

Commissioner Fiedler.

COMMISSIONER FIEDLER: So I'm going to reiterate something I wove this morning on a Taiwan scenario, especially because of your testimony. And I'll take issue with this concept of limited, which is an inherent contradiction in my experience with war. It's hard to limit them.

So I'm Xi Jinping. I've consolidated power in amazing fashion in the last two years, quite unexpected to anyone else. I've eliminated perhaps consensus leadership. I'm cleaning up the Party, but I've paralyzed it momentarily with an anti-corruption campaign. I've got a little problem in Hong Kong where people are talking back to me, kids especially, but with effect. So I'm looking--which moves Taiwan away from the idea of some accommodation with me.

And then I say, you know, I've denied the United States quick access to the Straits. I think that I can coerce the Taiwanese into a limited objective of I'll give you the same deal I gave the Hong Kong folks: I won't occupy you; maybe I'll have the PLA a little around; and I'll take care of your foreign policy. And when you say no--and the DPP is, say, maybe going to come back into power, and I'm at



least unsure of what direction they're going to go, but given their history, I don't like them--and I figure I can take--and then I have a domestic problem, some instability, which we all know is not going to take much more than a match to perhaps light, and my response to the domestic problem is I'm going to grab Taiwan, and I'm going to do it in a week, okay, by bracketing them with ballistic missiles, not killing a lot of people, but taking--and I'm not going to send anybody into land on their beaches. I'm going to scare the hell out of the population in Taiwan, and they're going to say, okay, okay.

And what do we do? Your testimony is do something about it. Prevent that from happening. I may agree or disagree. I actually tend to agree, but I'm not so sure that that results in a limited exercise when the legitimacy of the Party is at stake--so limited in our view, not limited in their view, right--which rapidly escalates into something bigger if we don't let them do it.

Now, if Taiwan's defense is the litmus test of American policy, then we're a loser. The United States is, according to some people's testimony this morning, is that, you know, we're hedging a little bit on this. You know we acknowledge that it's part of China. This is not--we're not talking about the Philippines. We're not talking about sovereignty of the Philippines. We're talking about sovereignty of someplace that we already have given away in a way. Okay. Diplomatically Kissinger and Nixon did it; right? And then others later.

Such an action would precipitate, I agree, every ally wondering what the will of the United States is. It might also precipitate a militarization of those allies in concert with the United States as a result. Is not a possibility? And in looking at the map, all our discussion is East Asia, is Japan-centric and Southeast Asia or northern Southeast Asia, if you will. We haven't talked encirclement.

The Chinese talk about us, worrying about, about us encircling them. We haven't encircled them yet. Perhaps such an adventurous move by the Chinese vis-a-vis Taiwan would precipitate such an encirclement. India has got to get worried. Lots of other people have to be worried.

Your option was accommodation as the only option, that if we didn't act, that the reaction would be, well, everybody would decide that we have to accommodate the Chinese. I'm not so sure that that is necessarily the overall reaction. Am I weaving a scenario that is out of line, that is impossible, that's not likely in the near future? I'm worried about the near future here.

MR. COLBY: Well, thank you for your thoughtful comments, Commissioner.

A couple of points I kind of want to address. I mean, first of all, I think the scenario that you're illustrating is very plausible, and especially in 2016 and thereafter maybe more than plausible, maybe likely. And so one of the things that I am inclined to think is that our position of ambiguity on Taiwan and certainly the sort of practical ambiguity that exists even within U.S. policy circles, not just as a function of our public rhetoric, may not be as wise as it once was because of the possibility of very dramatic escalation and conflict arising.

And so one thing I certainly hope, and I would encourage the Commission--I know you've already had hearings on this--but to think more carefully and urge the government to think more clearly about what we would actually do in the event of a Taiwan crisis because I'm not always convinced that that exists to the degree that it should.

You know--

VICE CHAIRMAN SHEA: So you're referring to ambiguity around U.S. response?

COMMISSIONER FIEDLER: Which is a matter of policy.

MR. COLBY: Right.

VICE CHAIRMAN SHEA: Right.

MR. COLBY: I'm actually not speaking so much about the policy of ambiguity itself, which may be right, although I think it's worth thinking about, but more my sort of practical and kind of everyday experience is that actually there is a lot of confusion about how the United States would actually react to such a scenario, even within U.S. policy and government circles, which I mean somebody--I think Richard Betts at Columbia puts it well, which is that ambiguity is a brilliant policy until it fails, and then it's criminally irresponsible.

I mean ambiguity is obviously easy, and it seems brilliant now because nothing is happening, but I think it could change quite quickly for the worse, and given that it's a much more competitive military

balance, that's a really serious problem.

You know, Commissioner, your point on limited war, I mean thank you, in a sense, for giving me the opportunity. I think the concept of limited war is not, and the attractiveness such as it is of limited war is not that it's some panacea or some way that should give one comfort that one can do it. In fact, limited war, especially with a nuclear-armed opponent, inherently is uncertain, stochastic, if you will, and you can never be sure that it will remain limited, which should give you the absolute greatest caution.

COMMISSIONER FIEDLER: Let me interrupt here a second--

MR. COLBY: Yeah.

COMMISSIONER FIEDLER: --the exchange.

MR. COLBY: Yeah.

COMMISSIONER FIEDLER: I'm not so concerned about your statement on limited war--

MR. COLBY: Oh.

COMMISSIONER FIEDLER: --as I am about the acceptance of limited defeat. In other words, I don't know how you actually--

MR. COLBY: You mean the adversaries. Right. Your point about they might feel the Party is--

COMMISSIONER FIEDLER: I'm not sure the Chinese are in a position, let's say on a core interest like Taiwan, to accept a limited defeat, to accept less than what they set out. If they set a limited objective and can't achieve it, that government is going to fall.

MR. COLBY: Right.

COMMISSIONER FIEDLER: And perhaps the Party. So that argues against limited war.

MR. COLBY: Well, because I think, if you think about it, I mean I'm talking about our military and kind of strategic posture, and it seems to me the alternative is between having, well, we could pull back, which I don't think anybody here is talking about, but you could either have a posture that is basically--could allow you to prevail, but would do so in ways that will really expand the conflict. And I think that will bring about the very thing we fear, which is an uncontrolled escalation between two nuclear-armed powers, whereas a limited ability at least opens the possibility that United States and China could come to some accommodation, ideally that China would accept our reasonable terms.

Now, I think you're bringing up the point about Taiwan may be so valuable to them that they may not--but then, in a sense, that raises, I think, questions about our political position, I mean, but in any case--

COMMISSIONER FIEDLER: It's all about politics in the end.

MR. COLBY: Right, but I think in any case, it's better for us to have a very capable limited war sort of capability because it reduces the amount of pressure we're putting on our political resolve. I mean if we can win a war or we can force the Chinese into a position where they are the ones who have to dramatically escalate--

COMMISSIONER FIEDLER: Yeah, I--

MR. COLBY: --we're at least in a better position.

COMMISSIONER FIEDLER: I still am--it's nice to talk about it like that, but the question if you accept the notion that they can deny us access at the moment, and as defined as access we had in 1996, then you have a different sort of dynamic and limitations. Already, it's expanded because they've denied us access so we have to do something bigger in order to do it, which it gets out of hand pretty quickly is my fear, just a general experience about war, but what do you guys think?

DR. MONTGOMERY: I think you raise two good points. Obviously this issue of Chinese legitimacy being on the line in certain scenarios like Taiwan has a big potential impact on escalation. The one caveat I guess I would make to that is China defines its core interests fairly expansively, and so I think you have to be, you don't want to get into a situation where you're taking limited options off the table because there are many potential scenarios where you can say that Chinese legitimacy is on the line, the Party is at risk if they don't win.

COMMISSIONER FIEDLER: I think we all agree that Taiwan is a real core interest to them as opposed to maybe the Spratlys.

DR. MONTGOMERY: I'm not a China expert so I wouldn't weigh in on that, but the other point

that I would just make that you raise is you raise the issue of would allies in the region, would China's neighbors bandwagon or balance in the aftermath of a conflict over Taiwan, and that in some ways really is the million dollar question, and I suspect most academics would say that they would balance because it's in their interests to do so, and I think a lot of policymakers would weigh in on the other side and say that they might bandwagon because they're afraid of that outcome.

I certainly don't have an answer to that question, but what I would say is while I think balancing is perhaps the more likely outcome over the long run, it's important to remember that China has a big resource advantage and a big head start in developing a lot of those capabilities so there's also questions about whether Japan and others in the region, if they were to balance more vigorously, would they be able to do so enough and in time.

COMMISSIONER FIEDLER: Rob.

MR. HADDICK: Well, I'll start off by saying that we agree that there's a one-China policy, but also another part of that, it was an assertion that there should be no use of force to resolve the Taiwan issue, and I think it would be important for future U.S. policymakers, important for U.S. credibility in the region, to stand by that no use of force or coercion to resolve the Taiwan issue as a principle because if the U.S. permitted the intimidation or use of force, threat of the use of force, to resolve the Taiwan issue, it would be very damaging for U.S. credibility, even in the light of the one-China policy.

Looking at the geostrategic positioning of Taiwan there in the first island chain, naval and air power strategists would not want to see Taiwan flip from friendly hands to adversary hands. The ability of an adversary to be able to operate from Taiwan and from the eastern side of Taiwan breaks the first island chain as a useful military and strategic feature, favorable to the U.S. and its allies or its partners in the region, and so that would be another aspect of the counsel that U.S. policymakers would very likely get from their naval and air commanders.

The loss of Taiwan to PRC or PLA control would be an enormous strategic setback to Japan, and if that occurred under circumstances whereby Japan lost confidence in the U.S., we know that Japan under circumstances like that can quickly become a nuclear weapon state and a missile, regional missile power. They have those technologies. They have large stockpiles of plutonium from their longstanding nuclear program, civilian nuclear electrical power generation program.

So Japan could quickly become a nuclear and missile power. Of course, that would have follow-on consequences in Korea and elsewhere in the region. It would be a very destabilizing scenario.

So the U.S. would be in a much better position to deter this whole thinking from even occurring in the first place if it had a force structure in the region that wasn't as risky as the current force structure is. If it could have the ability to deter military action without, from outside the missile range of China's principal anti-access weapons, if it didn't have to provide this strike capability with assets inside the region and close to Chinese firepower, it would stand a much better chance of being able to deter this in the first place and prevent Chinese leaders from having hypotheses along these lines. And so hopefully future changes to U.S. force structure will move along those lines.

COMMISSIONER FIEDLER: Can I make final--

VICE CHAIRMAN SHEA: Sure.

COMMISSIONER FIEDLER: --statement? What you've just laid out is that the implications for the United States to accept a limited defeat or any defeat in Taiwan are unacceptable, and I laid out that if they miscalculate and decide their time is now, then they're unwilling to accept limited defeat. Then we are really in the arena that I am most concerned about in terms of failure to be able to limit the conflict, and now we start to get into if when we're strong, they're weak, then now we start getting into nuclear--when there is tactical nuclear options and stuff like that that are really dangerous.

So I get from this that your comment that we can prepare ourselves for it, if we procure, okay, the procurement cycle is pretty damn long, and his comment that, well, you know, maybe they could do this in 2016 or '17, that's too short in the procurement cycle. So we're looking a little more like this could be a powder keg that people--

VICE CHAIRMAN SHEA: Don't know about.

COMMISSIONER FIEDLER: --and that--well, no, no. We've got plenty--we have so few

people and lots of time.

VICE CHAIRMAN SHEA: It's okay.

COMMISSIONER FIEDLER: The issue of ambiguity then comes up as a policy matter. In other words, should we pursue strategic ambiguity anymore if that's damn important to us; right? So, okay, I'm done.

VICE CHAIRMAN SHEA: All right. Thank you.

COMMISSIONER FIEDLER: I got my first, second and third round.

VICE CHAIRMAN SHEA: All right.

[Laughter.]

COMMISSIONER BARTHOLOMEW: Going into the fourth.

VICE CHAIRMAN SHEA: Commissioner Tobin, Dr. Tobin.

HEARING CO-CHAIR TOBIN: Thank you, Vice Chairman.

I have a lot of questions, but I think on this round I want to talk about the INF Treaty, and, Mr. Montgomery, in your testimony and orally, you touched on that. You talked about the fact that since Russia is not really playing by the rules, maybe we ought to think of stepping back from the treaty or lift it in Asia, you were saying.

So, this morning, in our first panel, I raised the question, and I plan to ask you as well. I want to hear what each of you as experts think about the INF Treaty. By the way, Mr. Yoshihara, I believe, said yes, back away, but the others said no, it's been very effective, we should not back off of that.

So I wonder what each of your thoughts are on the INF Treaty and also what are your thoughts of taking almost an inverse approach to what you've just said, which is to try to strengthen it, make it more worldwide, have Japan take it to I think he said the U.N., right, so that, I'd like to hear from each of you, but why don't we start with Mr. Montgomery.

DR. MONTGOMERY: Sure. Thank you very much for your question.

So the first thing I would say is I would not advocate doing anything precipitously. There are many things that you could do to exploit some of the benefits, ground-based offensive missiles that do not prohibit the INF Treaty, as long as you stay under the range limitation, under 500 kilometers, below.

There are also things that you could begin to do in terms of research and development. In fact, Mr. Colby has written about this issue as well, to potentially lay the foundation, but would not, to explore options without necessarily exercising, that also would not be in violation of the treaty. Any type of major modification, I think, certainly makes more sense if you really truly believe that Russia is intent on getting out of the treaty, and that's a bit of an open question.

I think dismissing the cheating that's been revealed as something that's not a serious concern is probably a bit wrongheaded. They've been talking about getting out of the treaty for over a decade. They've been pointing to China oftentimes as the reason why, and they're currently deploying or preparing to deploy intermediate range missiles in a region of Russia that suggests that they are directed against China more than NATO.

In terms of the idea of multilateralizing the treaty, this is an issue that a lot of people have raised, and it's an intriguing one. I'm very skeptical about it simply because a nation like China that has invested considerable resources in developing this very capable asymmetric advantage has absolutely no incentive right now to trade it away.

In fact, the only thing that might give them the incentive to do so is facing some sort of comparable missile threat from the United States or Russia or others. So if you look back at the history of the INF Treaty, it was the deployment of Pershing-2 intermediate range ballistic missiles and ground-launch cruise missiles by the United States in Europe that really put pressure on Russia to--Soviet Union to participate seriously in INF negotiations and ultimately to trade away far more missiles than we did because they faced a serious challenge.

But right now that idea of multilateralizing it just doesn't seem very plausible. There is another option that I think you hinted at, that nations like Japan could actually develop some of these capabilities--allies that are not party to the treaty. I think that's an intriguing idea as well, a bit more plausible. It does raise concerns about what the reaction would be in the region, the potential for overreaction, not just in

China, but nations like South Korea might be a bit concerned by that and that could create some alliance management problems for the United States.

It also wouldn't necessarily give us some of the benefits of having those missiles there ourselves in terms of assuring our allies.

HEARING CO-CHAIR TOBIN: Right.

DR. MONTGOMERY: And I think that's one benefit that needs to be taken into account.

HEARING CO-CHAIR TOBIN: Thank you.

Mr. Haddick.

MR. HADDICK: Well, I believe that the United States government should study this issue, study the possibility of abrogation of the treaty, and the Army, U.S. Army should, should get its missile program out of mothballs in terms of not building missiles and deploying them, but in terms of doctrine, training, concept development, and so forth, in order to shorten the timeline that it would take to actually stand up this capability in the future should it be necessary to do so.

At this moment, it's not necessary or vital or essential for the United States to abrogate the treaty. Programs that are in the works right now such as the new Long-Range Strike Bomber, the Virginia payload module for the Virginia attack submarine class, these will provide strike capabilities that are substitutes for the strike capabilities that you would get from theater range missile forces, and in the case of the bomber, in my view, that provide more, higher volume of firepower at a more affordable rate than you can get with a theater missile program.

So as long as these programs, such as the bomber and Virginia class submarine with enhanced land-attack missile capacity and so forth, are successful programs, are technologically successful, they're financially successful, they're managed well and so forth, then that reduces the pressure on U.S. government to have to face the decision of whether it should or should not abrogate the treaty.

Naturally there are risks. Programs as we've seen can go off the rails. They can have technology, management problems. There's the possibility of technological surprise regarding adversary countermeasures--developments in anti-submarine work or technology or the ability to find stealthy aircraft that were previously stealthy but not stealthy anymore. Those sorts of sudden developments could put at risk the happy scenario that I just described, and in that case, it would raise the, greatly raise the pressure on the United States to hedge its bets by abrogating the treaty and coming out with the Pershing-3 type of theater range missile and also Long Range Land-Attack cruise missiles based on land.

So just to sum up what I just said, it's not necessary right now, and if the programs currently in the works are successful, then the U.S. won't have to face that decision, but it's something to consider as a hedge.

HEARING CO-CHAIR TOBIN: And you've both said to look at the treaty and look just outside it to see how we can play it, I guess.

Mr. Colby.

MR. COLBY: Sure. Just briefly, I think fairly similar to what has been said previously so I'll be brief, but I think INF was traditionally seen as a beneficial treaty. It took away a real Soviet Russian, a needed capability, which was intermediate range ground-to-ground cruise and ballistic missiles, and it constrained us relatively minimally because in Europe we were able to do it with other things, and Asia is basically a maritime and aerial, aerospace theater, so we're able to perform conventional strike missions and nuclear strike missions with systems outside the accountable range of INF.

Of course, it locked out a huge range of Russian systems. Now, obviously, with the Russians violating the treaty, that sort of benefit is declining or has declined considerably. But looked at from a political basis, I think we don't want to be the bad guys here so discussions about whether we should withdraw from INF, I think we should be very loathe to do that unless we really determine that we can pin the Russians with responsibility, and that they will be the ones who are seen as at fault because we don't want to take the political heat, and that I think is particularly the case because, as Mr. Haddick rightly points out, I think, the military utility for us of these systems is pretty limited in the near term, not to mention for some of the procurement reasons, it would actually take quite awhile to put these systems up.

It would be fairly expensive, but I think it's, as Dr. Montgomery mentioned, our R&D and a

variety of other kind of analyses are completely licit under INF, and I think that they should not only be done, but Congress, I would hope that Congress and other accountable bodies will give the political cover and the legislative authority to the Department of Defense to authorize genuine research and development on these to see whether--we should have a continual understanding of what the cost/benefit is for not having, having access to these systems, and that should inform our cost/benefit analysis.

So something to think about would be almost like a yearly--in the NDAA or something--an annual report on the utility or "inutility" of ground-launched cruise and ballistic missiles for the United States' defense posture. For right now I don't think we need to do anything, but that might be something to think about as well.

HEARING CO-CHAIR TOBIN: Any comment on the multilateral?

MR. COLBY: Yeah, I'm with Dr. Montgomery. I think the Russians have tried to push this a few times, and I just think the Chinese are very, very unlikely--

HEARING CO-CHAIR TOBIN: Okay.

MR. COLBY: --to go for it. And I think on the allied front, in theory, I think it's great. From a military point of view, I think it would be very attractive. But under current political and strategic conditions, I think it's unlikely particularly that Japan would be interested, and also because of domestic neuralgia, but looking forward, I think it's something we should absolutely be receptive to, and something to think about if that came to pass would be perhaps U.S. cooperation in assisting Japan in the development if such systems could be licit under INF. That's something to explore as well.

HEARING CO-CHAIR TOBIN: Thank you.

VICE CHAIRMAN SHEA: Thank you.

Commissioner Bartholomew.

COMMISSIONER BARTHOLOMEW: Thank you very much and thank you, gentlemen.

Gosh, there's a lot. I guess in some ways building on the INF question or discussion, Dr. Montgomery, you mentioned the idea of ground-based missiles, us having ground-based missiles in countries in the region, and I just wonder whether there are countries in the region that would welcome that, would allow us to site it, which is an issue? What is your sense of that?

DR. MONTGOMERY: Absolutely it is an issue, and one of the points that I would stress is I think the real value of having ground-based missiles does indeed come if they are forward stationed in the region. There have been alternative proposals about flowing missile forces into the region during periods of crisis, for example, but that has the potential to be very destabilizing and to undermine some of the advantages.

In terms of who might be willing to host these missiles, that's the other million dollar question. And obviously you would look to allies like Japan and the Philippines potentially. Would they be willing to do it today? Probably not.

Would they be willing to do it by the time some of those systems actually came on line after you had done a period of research and development and exploration and gaming and everything else, meanwhile China was growing more powerful and more assertive, I would say that's a distinct possibility. Relations between East Asian states and China seem far different now, at least to me, than they did five years ago. So five years from now, it wouldn't surprise me.

COMMISSIONER BARTHOLOMEW: I admit that I find actually the things that you guys are saying refreshing in the bigger context of decades of discussion about U.S. policy toward China.

You mentioned, Mr. Colby, that we need to prepare for how to prevail in a limited conflict, but that goes right up against a very strong strain in the U.S. policy world of if you treat them like an enemy, they'll become an enemy. I think that people have become a little bit more sophisticated who are arguing that, but we still see very strong strains about that.

So even when I think about ground-based missiles, the Chinese would say that it was escalatory and somehow it would become our fault that things were getting more difficult because we had placed things there, and I just wondered how do you all respond to this sort of idea, that the Chinese are doing what they do in response to what we do?

MR. COLBY: Yeah, well, I sympathize. I mean I think at some level countries generally pursue

some conception of their interests, and they're not quite so determined by sensitivities and such. So I'm not so convinced by the sort of, oh, if we are not very nice to them, that they might--and also I think the things that we're talking about here are not about not being nice. They're about being realistic.

I was in a track 1.5 a couple years ago with a senior retired military official, who--I thought it was refreshing--frankly said to the Chinese interlocutors, you complain about Air-Sea Battle, but you know that we plan for war and you plan for a war, it's not personal, it's kind of business, and I think that's the sort of way I go about it.

And I was in China last weekend. I go there a lot. It's nothing personal, but I look at a country, kind of the additional point is just, I look at the facts. You know China's defense budget has grown by ten percent for the last 15 years.

COMMISSIONER BARTHOLOMEW: That we know.

MR. COLBY: That we know of. Thank you. And they're not building systems, you know, this conference last weekend, another former senior official said something I didn't quite agree with as much, which was, oh, there's sort of this instability, stability/instability paradox, or offense/defense cycle, where the Chinese are building these systems that we interpret as being a threatening--well, actually they are designed against us. I mean it's not like they're sort of designed against Martians, and we happen to proceed. No, they're designed against us.

VICE CHAIRMAN SHEA: Philippine fishing vessel.

COMMISSIONER BARTHOLOMEW: Right.

[Laughter.]

VICE CHAIRMAN SHEA: The DF-21 is a--but that trawler up there.

MR. COLBY: Yeah, exactly, right. So, which, look, I'm not saying that--I'm not telling them their business in the sense that they're doing something that I think is completely unreasonable. But I'm saying, well, we're going to take--we should take more consequent action, and the fact is that we have not been really reacting. I mean I think our force posture in the Pacific for all the strum und drang about American military superiority, the reality is that American military superiority is under a great deal of pressure in the Pacific as well to some extent in Europe.

And so for us to say these things is I think just dealing with the reality, and I think the Chinese are, in my experience, can appreciate--I think they would actually appreciate and respond to some sort of realistic candor.

COMMISSIONER BARTHOLOMEW: Any comments from either of the other of you?

DR. MONTGOMERY: Well, I don't think I can top that. But it's that old academic concept of the security dilemma, a cycle of provocation, no one really wants things to get out of hand, but somehow it does, and I think you can tie yourself in knots worrying a little bit too much about it, and I think kind of the growing sophistication about the conversation that you mentioned is getting away from that overly simplistic point of view that they are doing it because we are doing it.

And as Mr. Colby said, if you look at the facts, their military buildup over the past ten and 20 years is very different. The United States is a status quo power in the region. It's not trying to change the status quo. It's doing things that ostensibly benefit everyone in the region including in China.

So it's a problem that you're going to come up against, and it's a narrative that I think needs to be a bit knocked down, but it's certainly there. I think it's not as strong maybe as it was a few years ago, but-

COMMISSIONER BARTHOLOMEW: So, Mr. Haddick, I've been struggling a little bit with your salami slicing metaphor only because I feel like if you start with something like salami and slice it, the perception will be, well, when the slices are gone, it's over and--

VICE CHAIRMAN SHEA: No, it means you cut your finger when it's over.

[Laughter.]

COMMISSIONER BARTHOLOMEW: But it's more, I mean I've been sitting here trying to think of--it's more an accretive metaphor. I mean so when I see what China has been doing in the South China Sea, for example, they push out as far as they think they can get away with and had until relatively recently pulled back just a little bit, not all the way back, but now they're not even bothering to pull back.

I mean it's--

COMMISSIONER FIEDLER: It's more amoeba-like.

COMMISSIONER BARTHOLOMEW: Right. Yeah. I mean they just push, and there is no response, and I honestly am not sure what the response could be or would be. So I think that they're very carefully doing it, but it's accretive so that by the time you look up, it's done, and then what do you do? How do you make this rocky atoll carry the burden? I mean what do you do? What do we do as they are doing these things?

They've moved from just of moving on to these atolls to actually building on these atolls, and what is the next step? Is it going to be an ADIZ in the region, and then what do we do? Nothing? I know everybody is trying to grapple with these issues, but--

MR. HADDICK: Well, the credit for the term "salami slicing" goes to Thomas Schelling, who wrote the famous book *Arms and Influence* back in 1966 so he used the phrase in that book, and so he gets the credit for it.

COMMISSIONER BARTHOLOMEW: He gets the credit or the blame for that metaphor.

MR. HADDICK: Right. Yes, it's, I think China's, as I mentioned earlier, China's weakness or vulnerability with respect to salami slicing right now is it's on the wrong side or it can be placed on the wrong side of an information media diplomacy propaganda sort of strategy where the small victim countries have an advantage in that, in that sort of competition. And they can do more to inform the global community about the losses that they are suffering at the hands of Chinese assertiveness. So there's that element of it right there.

Other things that can be done are various measures that can increase the presence of Filipino, Vietnamese, Malaysian, Japanese fishing fleets, white hull vessels, coast guard vessels, police patrol vessels, and so forth, in the region to match the Chinese presence so that the appearance does not begin to grow that they are ceding these waters to China's Coast Guard and paramilitary forces.

So the front line of the resistance to salami slicing has to be done by the smaller countries in the region with the aim of gaining the propaganda, media, global public opinion advantage. The United States can support these efforts financially. They can support them through exchange programs with our Coast Guard, through security force assistance measures, naval, Coast Guard and so forth, to help increase their maritime presence there, to match the Chinese presence.

And then over the horizon, U.S. Navy and Air Force, Army, and Marine Corp can provide the presence to back up these front-line efforts that are happening on the civilian and paramilitary level.

COMMISSIONER BARTHOLOMEW: But are we past that stage already? I mean can these countries, these smaller countries--they can't match the Chinese resources when it comes to ships or I mean a Vietnamese fisherman is not going to be able to go up against the resources of China's Coast Guard.

MR. HADDICK: Right. But what we see happening, and it's an encouraging sign, are more and more defense cooperation occurring outside the U.S. orbit. In other words, Philippines and Vietnam cooperating more on military, paramilitary matters. India and Japan. India and Australia. Australia and Japan. India and Vietnam. Japan and the Philippines. Bilateral, multilateral sorts of arrangements. So greater cooperation there. Greater cooperation within ASEAN on these matters. They can go a long way, and there's a lot of improvements that can be made from where things are right now on these scores.

COMMISSIONER BARTHOLOMEW: Mr. Colby, have you got something to add?

MR. COLBY: Yeah, I just was going to add, I mean I agree with Mr. Haddick's points. On your first point, I thought on the salami slicing, I hadn't thought about the downsides of it. I think you're right. It lacks something. I mean maybe it's flippant, but I kind of like the poker analogy, which is that a lot of this is about considerations of whether the other side will meet your raise, and it's also cumulative, the credibility issue is over time, right. So I think part of what the Chinese have, it's emboldened them somewhat, is the sense that the U.S. is folding on small things, ostensibly small things, but that build up and create a perception about our overall resolve.

I mean I think a couple of things that we could think of in addition to what Mr. Haddick has rightly talked about is I think it's absolutely right that the allies and other kind of states in the region



should be the face, but the U.S. should be there available if the situation does get out of hand. The Chinese should understand that if they push too far that the U.S. will become involved, certainly if it involves Japan or the Philippines, and Vietnam obviously is a different story somewhat.

But things like freedom of navigation maneuvers, kind of public displays of U.S. military force, not in a belligerent way, but just saying we're here, we're prepared, exercises with these, the Filipinos or the Japanese, also the Malays, and the Indonesians potentially, Singaporeans, et cetera. I think those show a more active and sort of we are here and we have the resolve to be here.

And then I think the U.S. can also help on the capability side. I mean Ron O'Rourke has come up I think with the idea of selling I think Perry- class or Kidd-class ships to the Filipinos, basically giving them a lot of stuff, but also things like, for instance, some of my colleagues, Dr. Ratner and others, are working on this idea of maritime domain awareness. I mean some of the problem is the Chinese know what's going on more.

It's not just about the actual ship, but it's about controlling it, understanding where it is, understanding where the other people are. If we can help create a better maritime domain awareness in the South China Sea, that might help the problem too, and we could take a more overt role in that because it's sort of more of a back office function, and it could be the other countries' ships or other helicopters or whatever that are actually at the front, but that's another way I think the U.S. could be productively engaged.

COMMISSIONER BARTHOLOMEW: So the accretive model, of course, is the way the Chinese used to get intelligence, the grains of sand. One person picks up this, one person picks up this, and eventually you have a beach. Now, of course, with cyber theft, it's an entire vacuum cleaners' worth of sand at one time. So it shifts a little bit.

But I do think, Mr. Haddick, particularly, too, that the Chinese by their assertiveness/aggressiveness in the region are overplaying their own hand because they have raised alarm among these countries that I think would not necessarily--and with countries that did have questions about our presence in the region, and I think that that is in some ways now working to our advantage, creating relationships there that we had not had for a long time, and I think that that's helping.

But at the same time, of course, these countries are becoming economically dependent on China so we've just been talking about the security, sort of the military security domain here, but there's this whole economic aspect that's going on that is going to tie the hands of people's ability or a country's ability to respond or willingness sometimes I think. It's a tough one.

VICE CHAIRMAN SHEA: Let me just ask you, in our report last year, we said that the regional balance of military power is shifting away from the United States and its allies and associates and towards China. And that's what your testimony--that's what I hear from each of your testimonies. Is that correct? Under current situations, the balance of power is shifting? Do I hear "aye" or?

DR. MONTGOMERY: Yes.

MR. COLBY: Yes.

VICE CHAIRMAN SHEA: That's important. I mean that's an important statement to make. Now if we just keep the status quo, if we here in the U.S. keep the same trend line and China keeps its trend line, things are going to get worse, right, for the United States military--in terms of the balance of power?

Does that mean--when this happened in the Soviet era when the United States decided not to compete against the Soviets on conventional platforms, it said we have the nuclear option. Is that, God forbid, is that where we're going, that our deterrence will be a nuclear one?

MR. COLBY: Well, I think you're raising, Vice Chairman, exactly the right issue. I mean I think you're absolutely right, and, unfortunately, it's a relatively rare statement to hear it from a responsible body like this, that the military balance is shifting against us, and our position is deteriorating, and that that does, will have significant I think geopolitical consequences, and I think you're absolutely right.

I mean the way that I think about it is, well, you know, firstly, a more competitive military balance in and of itself is more likely to make nuclear weapons salient because you have inadvertent escalation problems. It's harder to control a war, as Commissioner Fiedler pointed out, when the two

sides are more evenly balanced.

I mean in 1994 or '95, the United States could fight a limited war very easily against China. What I'm saying, in a sense, is that we used to be able to fight a limited war really easily, now it's going to be more difficult, but now we actually have to pay attention to it.

But when you're fighting a country that's a nuclear-armed country that's much more powerful, you've got to fight harder and dirtier and nastier, and that makes nuclear weapons, which may be collocated, there may be misunderstandings. Furthermore, the Chinese are developing their own nuclear force. It's getting a little bit larger, not dramatically at this point, but not insignificantly, but it's becoming much more modernized, much more sophisticated, much more controllable, and that's going to give them more options for employment, which also makes it more useful.

And fundamentally, I think, Vice Chairman, as you said, if the conventional balance does tilt against us, it's still our policy officially that we rely on nuclear deterrence. We're prepared to go first against a country that has nuclear weapons or is not in compliance with its nonproliferation obligations under the current administration.

But most Americans think that that is pretty remote, and even very senior responsible officials would say--

VICE CHAIRMAN SHEA: I hope it's remote.

MR. COLBY: Yeah.

VICE CHAIRMAN SHEA: It's unfathomable, but--

MR. COLBY: Well, and that's very interesting, but I think the consequence of that is if the balance really goes against us and China is able to gain the military advantage and it's not assertive, maybe it gains the advantage and turns out to be quiescent and just say, okay, now we're satisfied. But maybe not, maybe it's assertive, and in that case, if you're Japan, if you're South Korea, if you're Taiwan, et cetera, et cetera, then your whole equation, your whole security equation that's existed for 50 years plus is suddenly a null, and then we've got to deal with the proliferation consequences.

And, in fact, my point, I think this is great for an American audience to hear, but when I'm in China, I try to say this to them, too, which is you've got to think about how does your military buildup end up if you're not--if you're too successful, you may end up with something you really don't want, and I think that's generally true.

VICE CHAIRMAN SHEA: I'll wrap up, but just real quick, do people in the U.S., the government besides this small group, understand this? Are they thinking about this? Anybody thinking about this?

MR. COLBY: I think there are a few people in the Defense Department who are, but I think that most people in the defense establishment and certainly beyond it are consumed with the Middle East, and there is a lack of attention to the possibility of major, major conflict, including nuclear, nuclear conflict, in a way that is kind of disturbing.

VICE CHAIRMAN SHEA: Commissioner Fiedler.

COMMISSIONER FIEDLER: Yeah, you made the point I think earlier about facts, you know, right. And I think you can see where I'm coming from. I'm not particularly soft. But let's look at the facts. They're a rising power with a modernizing military. If we are, if the balance isn't shifting as they are rising, all right, it's because we are no longer as overwhelmingly dominant as we were before.

So that I would say to you that there may be, I mean our--we're talking historical, grand historical moments here of rising powers where you wouldn't expect, I don't expect the balance to remain the same. Okay. And is the response going to be the old response, which is, okay, we're not overwhelmingly dominant so we better be overwhelmingly dominant again. And now I'm the rising power, and I say, well, if that's where you're going, I think I'll catch you before you get there.

I'll move before you get there. That was my earlier point on the procurement side. So this is very dangerous. So let me bring it back to today and go back to the Xi, just pick up the Xi issue. Is it in the United States' interest from a military or a strategic point of view that China have such a strong leader, such an assertive one with a--and the country having less of a consensus decision-making process, and the country having more professional military where they're not selling generalships to others? Okay.

Is that in our interest to have a strong leader like they have now facing us as a rising power? Xi Jinping? I mean some people would argue that, hey, that means you only got to deal with one guy. At least I know what I'm dealing with. That's why we've dealt with so many dictators for so long.

But what do you think? And he's a new assertive leader. That has implications for the United States.

MR. COLBY: Well, I don't think necessarily an assertive leader is necessarily against our interests. Xi Jinping, however, is an assertive leader who seems to be very interested in also being assertive in the international environment and in continuing China's military modernization campaign, and he looks like he is attempting to revitalize the rule of the Communist Party and the legitimacy of the Communist Party over the long term.

Now I'm not one who thinks that a liberalized China would solve all our problems. I think it would certainly ameliorate many of them, but it wouldn't solve them. But I think what Xi is trying to do is not something that is really in our interests.

Now it's better than total--certainly than chaos, I would think, but I think what he's trying to do is not consonant with what we would hope Asia would develop into.

COMMISSIONER FIEDLER: So let me refine it slightly before you answer. So we have an assertive leader with a country on the rise that's fragile, and from a U.S. policy point of view, we want to be careful. Okay. And now it, you might argue we're being over careful, or Carolyn would argue that we're over careful. I mean the notion of if you treat them like an enemy, they will be an enemy, which you adequately answered as being a dead oversimplification.

But we have a very dangerous sort of dynamic here and a difficult position for any administration, no matter Republican or Democrat.

DR. MONTGOMERY: I mean it's a great question, and I don't have an answer to it, but I think if you ask 50 people, you'll probably get 25 people saying the assertive leader is the better one and 25 saying the weak leader is. I think the real issue is--

COMMISSIONER FIEDLER: It's not an academic question though.

DR. MONTGOMERY: Well, it's not an academic question, but the United States can't really influence it. Whether Xi is going to be assertive and control corruption and modernize the PLA or whether you have a weak and fragmented China internally is to some extent beyond our ability to influence as a matter of policy.

But there are questions about how you would want to adapt the U.S. defense posture irrespective of the type of leader you face, and so I think that, that is the real question that you want to get at. Are there changes you would want to make in how the United States is postured and what its force structure looks like whether you fear a diversionary conflict by a weak actor that faces many internal attentions or whether you're concerned about a deliberate effort to overcome the status quo?

COMMISSIONER FIEDLER: The former is the greater concern it seems to me. An assertive leader who is presiding over a fragile country and doing things internationally to shore himself up domestically. That's the definition of adventurism in my book.

MR. COLBY: Yeah, I'd like to add to Dr. Montgomery's point. I mean I think just, and kind of referring back to your earlier comment, I mean I understand your point about arms race and arms competition. I think that is a significant one. I do feel that right now we're in a little bit of the Harold Brown comment about we build, they build/we don't build, they still build. I mean let's be clear, the Chinese have been building, and we have really not. Certainly in Asia, I mean our posture has really weakened considerably, certainly in relative terms.

I think that in some sense we may need to sprint just not even to stay the same, but just to keep ahead at all, and I think Dr. Montgomery is absolutely right in saying that we're the status quo power, and if I think particularly about a guy like Xi Jinping, I don't want to rest on his good graces, not that I think he's a terrible person necessarily, but I think this is the kind of person to whom you want to present a real deterrent.

COMMISSIONER FIEDLER: A strong--

MR. COLBY: A strong. Right. You want strong, measured, you want your political position.

You're absolutely right, it's a very complicated problem dealing with China, and I think we should take a measured and sort of rhetorically restrained approach. We should definitely seek engagement, but Xi Jinping should be under no illusion that seeking to improve his internal position or seeking to do other things by embarking on international aggression or adventurism is a smart course, and I think the best way to do that is for us to say--in a sense, it's politically neutral for us to say we're going to just be as strong as we possibly can because that makes our political decisions easier.

And I would be delighted if we said we're going to build up this amazing military in the Pacific, and we're going to stick with the status quo basically. But I think that itself is an incredibly ambitious task, but it's one I think we should set ourselves to try to meet.

COMMISSIONER FIEDLER: Thank you.

VICE CHAIRMAN SHEA: Our last question. Dr. Tobin.

HEARING CO-CHAIR TOBIN: Thank you.

Mr. Colby, on page two of your testimony, you have a sentence in there that I'm going to read. It just jumped out at me, and I want to ask you about that. I'd like to hear from Mr. Haddick and Dr. Montgomery, too.

You were building the case for the fact that the balance has shifted, and you went on to describe the difficulties, and you said these difficulties include the draw of U.S. military attention to other parts of the world and some sense of inertia, programmatic inertia in the Pentagon and elsewhere, and, perhaps most perniciously, the simple unwillingness of large swathes of U.S. opinion to believe that the U.S. military primacy could actually be seriously challenged.

So my question for all of you is how do we begin to educate over time? I mean we talked about procurement before, but how do we systematically, diplomatically, politically, educate the American public and our allies about this pernicious situation?

MR. COLBY: Thank you. Thank you for the question.

I wonder that a lot myself, and one of the things that makes me think that working in a think tank is actually marginally useful is that maybe we can contribute to that problem. I think that one of the things I would say is that I commend the Pentagon leadership, Deputy Secretary Work, Under Secretary Kendall, in particular, for their increasing candor and openness about the scale and sophistication of the military challenge that China and to a lesser degree Russia are posing to the United States.

I think that much more overt and clear and straightforward discussion of these challenges by responsible officials like in the Pentagon and ideally hopefully in the Congress, and yourselves included, would really help, and the one thing I would say is I think that it doesn't need to be in the old parlance "clearer than truth." I mean the simple facts are disturbing enough.

If you talk about--Americans don't necessarily know how reliant we are on space, but if people understand that the Chinese and Russians are building a range of very sophisticated systems that can hold our space assets and really our whole power projection model at risk, I think over time that they will, they will hopefully understand how significant that is.

And I think one of the other things is there's a way of talking about the potential for conflict that is realistic about it, and I worry sometimes that there is, including with this responsible defense and other political leaders, there's almost a sort of a sense that major war of the kind that we're talking about with China or Russia is impossible, and that it's just sort of unthinkable.

And I think that, God willing, it will never happen, but I think that it's unwise for us to act in that way. So I would really hope to see, again, a kind of a reasoned, sober, just-the-facts, ma'am, kind of laying out when we can of saying here's what's happening. Even if this doesn't become a major war, this gives a lot of coercive impact. You might not be seeing people getting beheaded, but the way I think about it is if the U.S. gets ISIS wrong or gets some of these radical groups wrong, it's a real problem for us. It can be very dangerous. But if we get China wrong, and it goes really south, then our whole world order could change in ways we may not much like. I would just hope that our political leaders and others would make that case more clearly.

HEARING CO-CHAIR TOBIN: So the political leaders and a media issue?

MR. COLBY: Yeah, I think it's a media issue, too. I think one of the difficult things is it's a lot

harder to--I mean there's so much attention on the Middle East and, for instance, if you think about it in the Russia context, one of the things I'm sometimes frustrated by is, well, the Russia problem is hybrid war, you know, it's the little green men, and yes, that is the tip of the problem.

But the real problem is the ability that the Russians have to mobilize 40,000 quite sophisticated and capable conventional forces right over the border and ultimately to escalate to the nuclear level, and that's what's really frightening. And I don't think that people are quite--

HEARING CO-CHAIR TOBIN: Right.

MR. COLBY: --getting that. Even informed people, and--

HEARING CO-CHAIR TOBIN: Well, you're preaching to the choir here on that one.

MR. COLBY: Yeah, I know I'm preaching to the choir, but I hope, I hope that that message gets out, and I think you've just got to keep saying it.

HEARING CO-CHAIR TOBIN: Keep thinking on it because that pernicious piece is indeed pernicious.

MR. COLBY: Yeah.

HEARING CO-CHAIR TOBIN: Dr. Montgomery.

DR. MONTGOMERY: Sure. I'll just add that to some extent I think the United States is still in a bit of the afterglow of the unipolar moment of the period of uncontested primacy. I think there's still a lot of reason to think that the United States will remain first among equals for sometime. It's not going to be quite as easy going as it has been in the recent past.

But whether it's the public opinion or the Pentagon, it doesn't turn on a dime. I think even over the past three to five years, you've seen a fairly substantial change in how people talk about China, the military balance in the Asia-Pacific, and it's becoming a bit more grounded and a bit more realistic.

But the only other point I would make is that when you do have those conversations and when you do highlight these challenges, it's really important to have concrete measures you're taking to address them right alongside because otherwise it just makes everyone really, really worried, and I think it's the combination of the two that's both powerful but also useful.

HEARING CO-CHAIR TOBIN: You're right. The Pew survey people have done a service recently, but we need to pair it.

Mr. Haddick, the final words; right?

VICE CHAIRMAN SHEA: Right.

MR. HADDICK: Well, I think the U.S. State Department can play a much greater role in terms of public diplomacy in exposing and explaining the looming geopolitical challenges in East Asia. Of course, in order for that to happen, the U.S. government at the highest level on down has to shed, overcome, cast aside, the longstanding bipartisan policy of forbearance towards China, which has been in existence for such a long time now.

Obviously, there's a lot of nervousness and reluctance to face up to that, but as China's assertions continue, it's going to become increasingly self-evident that that has to happen, that the forbearance era will have to come to an end, but when it does, the State Department working with allies and partners in the region can do a lot to explain the narrative about what's going on in the South China Sea, what's going on in the region, the competition, and the looming crisis that's building. Because of the forbearance policy, they haven't been able to do that, but that will change, I think, and then the story and the education process can begin.

HEARING CO-CHAIR TOBIN: Thank you very much.

VICE CHAIRMAN SHEA: Well, I want to thank our three witnesses for a very spirited and interesting discussion. Thank you again for sharing your expertise, and I know Commissioner Tobin and I would also like to express our gratitude to the Commission staff who helped orchestrate today's proceedings. In particular, we thank Kimberly Hsu. Thank you, Kimberly. Jordan Wilson, thank you. Chris Fioravante and Reed Eckhold.

The Commission's next hearing on China's 13th Five-Year Plan will take place on April 22, and with that, this hearing is adjourned.

[Whereupon, at 3:03 p.m., the hearing was adjourned.]