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# NUCLEAR WEAPONS MODERNIZATION IN RUSSIA AND CHINA: UNDERSTANDING IMPACTS TO THE UNITED STATES

HEARING

BEFORE THE

SUBCOMMITTEE ON STRATEGIC FORCES

OF THE

COMMITTEE ON ARMED SERVICES
HOUSE OF REPRESENTATIVES

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HOUSE OF REPRESENTATIVES,
COMMITTEE ON ARMED SERVICES,
SUBCOMMITTEE ON STRATEGIC FORCES,
*Washington, DC, Friday, October 14, 2011.*

The subcommittee met, pursuant to call, at 11:38 a.m., in room 2212, Rayburn House Office Building, Hon. Michael Turner (chairman of the subcommittee) presiding.

## OPENING STATEMENT OF HON. MICHAEL TURNER, A REPRESENTATIVE FROM OHIO, CHAIRMAN, SUBCOMMITTEE ON STRATEGIC FORCES

Mr. TURNER. Good morning. I want to welcome everyone to the Strategic Forces Subcommittee's hearing on "Nuclear Weapons Modernization in Russia and China: Understanding Impacts to the United States."

This hearing is very timely because we are currently faced with a highly uncertain future regarding our own nuclear deterrent modernization program. Despite commitments from many key leaders, that modernization of our nuclear weapons stockpile, delivery systems, and supporting infrastructure is critically needed.

We are on the verge of halting our modernization program before it even begins. The fiscal year 2012 Energy and Water appropriation bills currently in Congress would make dramatic cuts to nuclear modernization funding levels that were agreed to last year by the President and Senate during consideration on the New START [Strategic Arms Reduction Treaty] treaty.

In that context, it is important to understand if and how other countries, especially China and Russia, are modernizing their nuclear forces and how that modernization should impact our decisions here in the United States.

To help us explore these issues, we have before us several distinguished non-governmental experts on nuclear weapons program strategies and forces in China and Russia.

They are Dr. Mark Schneider, Senior Analyst, National Institute for Public Policy; Mr. Richard Fisher, Jr., Senior Fellow, International Assessment and Strategy Center; and Dr. Jeffrey Lewis, Director, East Asia Nonproliferation Program, James Martin Center for Nonproliferation Studies, Monterey Institute of International Studies.

Thank you all for joining us today. We appreciate you sharing your insights with us. Based upon your written statements, you all

seem to be in agreement that Russia and China are modernizing their nuclear forces.

Dr. Schneider, you point out that "Russia is modernizing every leg of its nuclear triad with new, more advanced systems," including new ballistic missile submarines, new heavy ICBMs [intercontinental ballistic missiles] carrying up to 15 warheads each, new shorter-range ballistic missiles, and new low-yield warheads.

You highlight a series of disturbing statements by senior Russian officials regarding how Russia has come to put increased emphasis on nuclear weapons in military planning, including a possible intention to use nuclear weapons first in an attempt to end regional- or even local-level conventional wars.

Dr. Schneider, you also reference information that Russia may possibly be violating the Intermediate Nuclear Forces Treaty. If true, this is deeply disturbing. I hope you will discuss this in the summary of your remarks.

Mr. Fisher, you point out that China is steadily increasing the numbers and capabilities of the ballistic missiles it deploys and is upgrading older ICBMs to newer, more advanced systems. China also appears to be actively working to develop a submarine-based nuclear deterrent force, something it has never had.

Your testimony also highlights reports of a very large tunnel system China has constructed. A recent unclassified Department of Defense report says that this network of tunnels could be in excess of 5,000 kilometers and is used to transport nuclear weapons and forces.

An unclassified study commissioned by the Defense Threat Reduction Agency, and conducted by Dr. Phillip Karber out of Georgetown, is about to be released, which goes into even greater detail on this worrying development.

As we strive to make our nuclear forces more transparent, China is building this underground tunnel system to make its nuclear forces even more opaque.

Dr. Lewis, from your prepared statement, it appears that while you agree with your fellow witnesses that China and Russia are modernizing, you likely don't agree with them on what the implications of that modernization are for the United States and for our decisionmaking.

But you do caution that some of the modernization efforts in China and Russia could lead to instability in a crisis. In particular, I would appreciate if in your opening statement you would touch on the stability implications of deployment of a heavy, multiple-warhead, fixed silo-based ICBM in Russia as well as China's nuclear force concept of operations—which requires arming their delivery systems in a crisis.

With all of this modernization going on in Russia and China—and every other nuclear power—our own nuclear modernization program may never get past the "plan" stage.

Last December, President Obama and the Senate agreed to robust funding for nuclear modernization efforts. In letters to the Senate, President Obama agreed to modernize the strategic triad of delivery systems and accelerate key infrastructure products at NNSA [National Nuclear Security Administration] labs and plants.

The President also said, "I recognize that nuclear modernization requires investment for the long-term, in addition to this one-year budget increase. That is my commitment to the Congress—that my Administration will pursue these programs and capabilities for as long as I am President."

The President came through on this pledge in his budget request, and then the House supported full funding for NNSA in fiscal year 2012 Budget Act and the Fiscal Year 2012 National Defense Authorization Act. But now, that commitment is falling apart and stalling. The fiscal year 2012 Energy and Water appropriations bills would cut NNSA funding by up to 10 percent for the budget request and the current continuing resolution returns NNSA to 1.5 percent less than fiscal year 2011 levels.

In the House, 65 Members signed on to a letter—one that contains gross inaccuracies about the cost of sustaining and modernizing our stockpile—calling for over $200 billion in cuts of nuclear weapons funding over 10 years.

Considering that the budget for sustaining, operating, and modernizing our nuclear weapons complex and nuclear forces is on the order of $220 billion over the next 10 years, the cuts proposed in this letter would amount to unilateral disarmament. I was disappointed to see that so many of my colleagues signed on to such an irrational proposal.

But I am thankful that all of my majority colleagues on this subcommittee are standing firm for the need for modernization. We recently sent a letter to four key Senate appropriators, asking them to stand by a written commitment the Senators had previously made to the President last December, in which they each pledged their "support for ratification of the New START Treaty and full funding for the modernization of nuclear weapons arsenal."

No less an authority than the Secretary of Defense supports fully funding NNSA's nuclear modernization efforts. Just yesterday in testimony before our committee, Secretary Panetta said he "certainly would oppose any reductions with regards to the funding for nuclear [modernization]." This is a strong statement of support from a Secretary who is under intense pressure to cut defense spending.

Secretary Panetta also said at yesterday's hearing, "With regard to reducing our nuclear arena, I think that this is an area where I don't think we ought to do that unilaterally; we ought to do that on the basis of negotiations with the Russians and others to make sure that we are all walking the same path."

I couldn't agree more. That is why one of the New START Implementation Act provisions contained in the House-passed fiscal year 2012 NDAA [National Defense Authorization Act] link would ensure that we don't unilaterally reduce, and that any further reductions occur in conjunction with a formal treaty or an act of Congress.

Today, we are going to examine nuclear modernization efforts in Russia and China. We need to understand what these countries are doing, in contrast to what we are doing. Our nuclear modernization plans is just that. It is just a plan.

We are only beginning to embark on it. Meanwhile, these other countries continue to advance the capability and reliability of their

nuclear forces. We need to understand the potential long-term consequences of watching as Russia and China modernize their nuclear arsenal—while we sit back and simply maintain our existing aging nuclear forces.

With that, let me turn to my ranking member, Ms. Sanchez, for her opening statement and appreciate her.

[The prepared statement of Mr. Turner can be found in the Appendix on page 27.]

**STATEMENT OF HON. LORETTA SANCHEZ, A REPRESENTATIVE FROM CALIFORNIA, RANKING MEMBER, SUBCOMMITTEE ON STRATEGIC FORCES**

Ms. SANCHEZ. Thank you, Mr. Chairman. I join Chairman Turner in welcoming Dr. Schneider, Mr. Fisher, and Dr. Lewis to this hearing about the modernization of Russia and China's nuclear weapons programs and the impact that it would have, and does have, on our nuclear policy and our posture.

This is an issue, of course, of big interest to the subcommittee and this hearing is, I think, very useful as a follow-on to the classified briefings that our subcommittee has recently received on nuclear weapons programs earlier this summer.

We have been working very hard to get everybody up to speed on this committee in an effort to, I think, have as unified a voice as we can about the security and issues that we have here on this committee.

I think this is a very valuable opportunity for us to get a better understanding of where we believe modernization efforts, what direction they are going for both of these countries, the different models that are being used to maintain nuclear weapons, how these nuclear weapons, the modernization plans, add to the capability of Russia and China vis-a-vis our capabilities; whether they add to the deterrence in the sense of, if you have weapons does that deter others from using them and therefore nobody is using them or whether the fact that they are modernizing—how that impacts our own arsenal and what types of modernization efforts we might consider, considering that both the United States and Russia have over 95 percent of the nuclear weapons in the world's arsenal.

Given those efforts, we want to do what is the best progress in making the changes that we need for our nuclear weapons policy. And in this context I would love to hear your views, particularly on how we can most effectively decrease the risk that nuclear weapons might be employed as a result of accidental or unauthorized launch. That is one of my biggest worries with respect to China and Russia. Do they have the capability to keep everything in check, even in chaotic times?

On whether multilateral measures, such as the Comprehensive Test Ban Treaty, would help them for nuclear weapons modernization, and what must be done to preserve and to strengthen our strategic stability vis-a-vis what is going on with Russia and China?

So I thank you for your expertise and our subcommittee looks forward to hearing from you.

Thank you, Mr. Chairman.

[The prepared statement of Ms. Sanchez can be found in the Appendix on page 31.]

Mr. TURNER. Thank you.

The subcommittee has received written statements from each of the witnesses, and without objection, these statements will be made part of the record.

And now, we will turn to our witnesses and ask each to summarize their written statement in about 5 minutes. We will then proceed with Member questions.

We will start with Dr. Schneider.

## STATEMENT OF DR. MARK B. SCHNEIDER, SENIOR ANALYST, NATIONAL INSTITUTE FOR PUBLIC POLICY

Dr. SCHNEIDER. Thank you, Mr. Chairman, Ranking Minority Member Sanchez, and distinguished members of this committee, for inviting me to testify. I think this is a very important topic, nuclear deterrence. And the success of nuclear deterrence is absolutely critical.

I believe that there is a great deal of similarity between Russia and China in terms of the modernization programs and the role of nuclear weapons and their strategy. There is very little similarity between their views and our views on nuclear weapons, and I think that creates a very dangerous situation, particularly if we make unilateral cuts in our capabilities.

The Russians and the Chinese are modernizing every element of their strategic triad. There is no debate about that at all. You have the older programs which were begun in the 1990s that have now reached fruition, that they are either being deployed or just about to be deployed. That's the SS–27 and the Bulava-30 SLBM [submarine-launched ballistic missile] with a new *Borei* class submarine.

In 2011, the Russians announced a major increase in nuclear delivery vehicle capabilities that involves four new or modified ICBMs and SLBMs. The most threatening is the new heavy ICBM, which is basically a cold war relic, and the main mission being counterforce attacks against the U.S. ICBM force.

The general trend in their capabilities has been going to larger numbers of MIRV [multiple independently targetable reentry vehicle] weapons, the 10 to 15 you mentioned, Mr. Chairman, on the new heavy. And you know, numbers like 12, 10, 6 on various other missiles. That is a major shift in their policy.

The Chinese are deploying right now two new ICBMs, DF–31 and DF–31A. They are building a new missile submarine, a new ballistic missile, and an improved bomber. The Chinese are much more secretive about their plans than the Russians are, and we have very incomplete information in many respects on that.

But certainly there is evidence, particularly in the Asian press that they—and there is some confirmation of this in the Pentagon report on Chinese military power—that they are going to MIRV their ICBM and developing a new MIRV ICBM, referred to as DF–41 in the Asian press. And there are reports in the Asian press of one, possibly two, MIRV SLBMs. So we are seeing a major increase in capability.

Both Russia and China are increasing. They have announced they are actually increasing the number of their nuclear weapons. In the case of Russia that is to build up to the New START levels, which they are currently below in terms of accountable warheads by 2018. However, since New START only counts one weapon per bomber, they could be as much as 800 warheads above the New START limits. They have the countable number.

The Russians and Chinese are developing new types of nuclear weapons. There is no dispute. There is no serious dispute about the case of Russians. Senior military leaders have actually said this on numerous occasions that, as Mr. Chairman Turner stated, they are developing low collateral damage and precision low-yield nuclear weapons. There are multiple sources of information on that.

And there are reports that both are engaged in very low-yield nuclear testing. And that makes sense in light of the modernization program. Russia has literally thousands of nuclear weapons. The Obama administration has acknowledged that they have 10 times the number of weapons that we do.

It is not only the numbers, it is the diversity of the weapons. They have capabilities to attack a wide variety of targets that we simply do not have the ability to attack, because of the unilateral reductions in our—well, not unilateral—reductions in our capability over the last 10 or 15 years.

Mr. Chairman, the reports of the new prohibited ground launch cruise missile are actually pretty common in the Russian press. They are concerned in the sense that they could be recreating what was supposedly eliminated with the—actually was, I believe, at the time—the Zero Option INF [Intermediate-Range Nuclear Forces] Treaty.

I debated whether to put this into the statement, because I didn't want to distract attention from the broader aspects of the Russian programs. This is, I think, a very important thing. There are a large number of reports. It comes from people all over the political spectrum and in the Russian Federation.

And I think in light of the number of reports and the nature of the people who are making these reports, the journalists and the arms control experts, I would take this very seriously. And I think it ought to be looked at on a serious basis.

The Russian and Chinese have different—notionally different—nuclear doctrines. I think there is more similarity between China and Russia than the notional announced doctrines, in the sense I do not believe the Chinese "no first use" policy is real. If you take a very close look at it, it doesn't commit them to anything because we were the first to use nuclear weapons to end World War II.

And there are still reports in the Japanese press, the Kyodo News Agency, says they have obtained classified Chinese documents which talked about adjusting the nuclear use threshold and engaging in preemptive nuclear strikes in a conventional war.

Russians are very overtly in that direction. This has been stated at the highest level, and in their published military doctrine they reserve the right to use nuclear weapons, not only in response to nuclear attack or a chemical or biological attack, but in conventional warfare under certain conditions.

This is very disturbing, because they literally characterize the first use of nuclear weapons as de-escalation of the conflict. That is literally amazing. I mean, I cannot imagine anybody really believing that, but that is what they say.

Mr. TURNER. Dr. Schneider, I need you to conclude so we can move to the other witnesses and then get to questions. If you could take just a few moments to conclude your statement?

Dr. SCHNEIDER. Okay, I will try to go very fast.

The Russians exercise all the time in nuclear escalation scenarios in local warfare, and they also do major announced strategic nuclear exercises. I believe a lot of this is political intimidation. The Russians have engaged in numerous types of nuclear threats, including 15, approximately, high-level nuclear targeting threats.

They fly bombers into air defense identification zones of the U.S., NATO [North Atlantic Treaty Organization] and Japan. The most recent one was on Wednesday of this week, where they precipitated defensive reactions by three NATO air forces. I regard that as beyond the pale.

[The prepared statement of Dr. Schneider can be found in the Appendix on page 33.]

Mr. TURNER. Thank you, Dr. Schneider. As we ask questions, perhaps you can embellish with the remainder of your statement.

Mr. Fisher.

## STATEMENT OF RICHARD D. FISHER, JR., SENIOR FELLOW, INTERNATIONAL ASSESSMENT AND STRATEGY CENTER

Mr. FISHER. Thank you. Today, to assist this committee's deliberations on one of the most vexing challenges to the security of the United States: how to assess the future strategic nuclear capabilities of the People's Republic of China's People's Liberation Army, and how to plan for the U.S. strategic capabilities that will ensure deterrence of PRC [People's Republic of China] nuclear aggression and coercion against the United States, its friends and allies.

Just as one citizen speaking for myself, I would like to thank the chairman and the members of this committee for taking the time to explore these issues you have listed for today's hearing, as they will have a direct bearing on decisions for which there may be little margin for error and will require the steady leadership of this committee.

I am aware that your deliberations are now taking place in what could quickly become a dire budgetary environment, which has already caused deep bipartisan concern, to include many members of this committee, and as seen by the warnings over the last several days by Secretary of Defense Panetta.

There has been speculation in the press of cutbacks in strategic systems. However, standing on my nearly two decades of research on China's general military trends, and focusing as well on its strategic modernization, I would add my voice of concern to those who are also raising concern about the potential cuts in our strategic capabilities that could follow from these widely reported budgetary reductions.

By way of summarizing my written testimony for which I have submitted for the record, I would like to offer five main points about China's nuclear and military modernization.

First, at this time in our relationship with the PRC, and perhaps as long as the Chinese Communist Party remains in power, it is not the time to be reducing American nuclear and conventional deterrent capabilities, especially in Asia.

As the PRC leadership perceives weakness in the United States, it will be emboldened to take risks. The PRC has a history of engaging in optional wars, especially if it can change its strategic environment at very little cost. We have seen this in Vietnam, Korea, against India.

And it is worth noting that the next leader of the PRC, Xi Jinping, for a time worked for a very high office in the PLA [People's Liberation Army] Central Military Commission while Deng Xiaoping was conducting a very successful war against Vietnam in 1979. He saw how to take risks militarily.

From the Korean Peninsula to the Taiwan Strait, East China Sea, South China Sea, its support for nuclear and missile technology proliferation, its threatening behavior in the commons of cyberspace, space, the United States finds itself in some degree of confrontation with China, and sometimes rather alone.

And while we can point to many positive actions and indications from the PRC, I do not believe that these include agreement on what levels of military transparency can lead to confidence, especially confidence regarding nuclear forces. The PRC in recent years has rejected real discussions with the United States that might lead to nuclear stability. But it is also not clear that China's potential demands to agree to nuclear stability would be acceptable to the United States.

My second point is that it would be necessary to hold up what is accepted knowledge, what we think we know about PRC nuclear policies and strategies, to a much longer history of Chinese strategies that venerate deception. Will the PRC always have a small force focused on the needs of retaliation? The doubts that have already been raised about China's "no first use" policy. I would agree with that.

And for a military that is now building toward global power projection capabilities—naval, air, airmobile army forces—what is to say that China will always be satisfied with a smallish nuclear force for just retaliation?

My third point would be that it is important to understand the breadth and direction of the PLA's nuclear modernization as we try to understand their policies and their build-up. This question takes up most of my prepared testimony. At the top of my concerns would be how quickly will the PLA start to deploy new ICBMs and SLBMs with multiple warheads?

There is a new large mobile ICBM for which we have had public imagery since 2007, but for which the Pentagon has not yet publicly identified. My sources suggest that this ICBM could carry up to 10 warheads. There is a potential for outfitting older DF–5 ICBMs and perhaps future versions of the DF–31 and JL–2.

A second concern would be growth in the PLA's regional missile forces. Reports earlier this year indicate that they are now developing a new 4,000-kilometer IRBM [intermediate range ballistic missile] that could be ready by 2015 to supplement the DF–31 or

DF–21 MRBM [medium range ballistic missile]. And we have seen phenomenal growth in the number of land attack cruise missiles.

My third concern would be to monitor the PLA's progress in developing an eventual national missile defense capability and expanded space warfare capabilities.

And my fourth point would be that one crucial difference between the challenges of deterring Russia and deterring the PRC pertains to the degree that China has abetted the nuclear capabilities of North Korea, Iran, Pakistan, helped them to become a network of proliferation.

And these countries with their known relationships to terrorist organizations appear to be moving toward an age that may include nuclear terrorism. How does the United States—the United States, in my opinion, has failed to arrest China's support for this network. We may in the not-too-distant future be paying a very heavy price.

And this leads to my fourth and final point, and I will conclude. Looking toward the future of the American nuclear deterrent posturing capability, looking into this decade and beyond, the deterrence challenge from the PRC is not just limited to the PRC per se, but should also include a network of dictatorships who either currently or imminently could have nuclear systems abetted by China.

How do we convince the Chinese not just to stop abetting this network, but to help us roll it back? All of this points to me for a requirement for grave caution, especially as this committee considers very important questions about funding and preserving a nuclear deterrent capability that must be preserved.

Thank you very much, Mr. Chairman.

[The prepared statement of Mr. Fisher can be found in the Appendix on page 48.]

Mr. TURNER. Thank you. Dr. Lewis.

**STATEMENT OF DR. JEFFREY LEWIS, DIRECTOR, EAST ASIA NONPROLIFERATION PROGRAM, JAMES MARTIN CENTER FOR NONPROLIFERATION STUDIES, MONTEREY INSTITUTE OF INTERNATIONAL STUDIES**

Dr. LEWIS. Thank you. Well, it should go without saying that it is an honor to be here before you today. The place I would like to start is by noting that no country has used a nuclear weapon in anger since the end of the Second World War, and that our overriding interest is in continuing this norm against nuclear use.

With the end of the cold war, I think today the principal danger is not a surprise attack or a bolt from the blue by Russia or China. Rather, the most plausible route to nuclear use is now an accident, an unauthorized use or miscalculation in a crisis. It is in the United States interest that we drive these risks as low as possible while maintaining our nuclear deterrent.

It is sometimes said that the United States is the only country that is not modernizing its nuclear arsenal. I would submit that this is not true. In some cases phrases like nuclear modernization confuse the modernization of bombers, missiles, and submarines with the design of new nuclear warheads or new bombs.

All states with nuclear weapons, including the United States, are replacing or modernizing delivery vehicles. The U.S. triad of stra-

tegic forces, ballistic missile submarines, intercontinental ballistic missiles and bombers, I believe remains the most professional, most capable, and best funded strategic force in the world.

There are no countries producing "new" nuclear warheads today, although the United States, Russia, and China continue to manufacture nuclear warheads that were designed and tested before each signed the Comprehensive Nuclear Test Ban Treaty in 1996.

Like the United States, both Russia and China are conducting subcritical experiments at their former nuclear test sites to support ongoing stockpile stewardship. Preparations for subcritical tasks are very difficult to distinguish from very low-yield "hydronuclear tests." Russia and China could not, however, develop new nuclear weapons with yields that I would consider militarily significant without conducting tests large enough to be readily detected.

Overall, I believe the United States is the best equipped of the three states to maintain its stockpile of nuclear weapons under the current moratorium on explosive nuclear testing. There is no one in the United States today who I believe would seriously propose swapping our nuclear stockpile and our triad of delivery vehicles for those of either Russia or China.

It will not surprise you that I disagree with many of the assertions made about the details of Russia and China's programs today, but those details are not what is fundamentally important given the numbers that we are looking at right now. There are no foreseeable scenarios under which either country could initiate the use of nuclear weapons against the United States, our forces abroad, or allies without suffering overwhelming destruction that would outweigh any possible gains.

Deterrence against nuclear attack from Russia and China today, I believe, is incredibly strong. There are however, however remote, plausible scenarios that may result in the use of one or more Russian or Chinese nuclear weapons. These are non-deliberate scenarios.

The most pressing task for the United States is to ensure that our nuclear forces, policies, and postures can provide for stable deterrence during a serious crisis with either country. Russian leaders dating to the Soviet era have been deeply concerned about their ability to command their nuclear forces during a crisis, and have long feared a decapitating strike by the United States.

However unreasonable, such fears seem to have outlasted the cold war. The most well-known case involved a false alarm in 1995 when Russian officials momentarily mistook a Norwegian sounding rocket for an American attack.

Whether such fears are reasonable or not, they explain a series of, I find, otherwise puzzling Russian behaviors. The Soviet Union constructed a system called Perimeter, which is sometimes called the "Dead Hand," that would ensure Soviet nuclear forces could retaliate in the event that their leadership had been killed.

The Russian Federation expressed a very strange concern about the possibility that U.S. missile defense interceptors in Poland might be fitted with nuclear weapons and used like a Pershing II in the cold war. Russian officials also insisted in the New START negotiations on a provision prohibiting parties from placing offense

missiles in missile defense silos. They also insisted on a higher number of warheads, but a lower number of delivery vehicles.

Although Russian officials do not say so directly, I think these otherwise puzzling actions reveal a continuing worry about their ability to command their nuclear forces in a crisis. Some of the actions that they may take to ensure their ability to retaliate may be deeply dangerous.

With China, the challenge is somewhat different. Chinese leaders appear to keep their limited number of nuclear weapons in a state of "no-alert," with the warheads stored separately. In a serious crisis, according to some training materials for Chinese officers, Beijing intends to place these forces on alert as a signal to American policymakers to signal their resolve.

As Beijing deploys new mobile missiles, this may mean sending those missiles out into the field and flushing ballistic missile submarines into the ocean. It is not clear to me how an American President might respond to such a signal, especially if the crisis were a serious one. And I would just note that the recent history of the U.S.-China crisis management is not encouraging in this regard.

I will just simply close by noting that these challenges require not more deterrence, but continued attention from the United States to ensure that our overwhelming capacity to deter Russia and China is both effective and stable. My 5 minutes are up, so let me give you the time you need to find out what you want to know.

[The prepared statement of Dr. Lewis can be found in the Appendix on page 73.]

Mr. TURNER. Thank you so much. Dr. Schneider, I want to return to the topic in which you were leaving off in your opening statement. And I am going to ask you to elaborate on the disturbing statements that you were referencing that were made by senior Russian officials about their nuclear forces and how their nuclear employment policies are changing, and how should we view these statements in conjunction with Russia's nuclear weapons modernization efforts?

As you were stating, Russia's military doctrine appears to be putting increasing emphasis on nuclear weapons as a means to deter, prevent and, disturbingly, as you stated, de-escalate conflicts, which as you said makes no sense even in conflicts at the regional or local level. Some Russian officials have even talked about using nuclear weapons in a preventive or preemptive manner in a conventional conflict.

I would like you to discuss, then, the nexus between what you were identifying. What are the implications of this for the U.S. and the allies as we provide extended deterrent assurances? What does it mean for our policies? What does it mean that we should be looking to for capabilities? I know many of our NATO partners believe that Russia's shift in policies are compensating for deficiencies in its conventional forces.

And I am pleased to note that in all of your statements, every one of you, in indicating that, you know, we have not had a nuclear conflict, a nuclear conflict being unlikely when we have a strong deterrent. I mean that is really the whole aspect of the crux of the

hearing is that, you know, we understand that nuclear conflict is unlikely if there is strong deterrent.

So we have to evaluate what are the effects on our deterrent, how can it possibly be weakened, what others are doing, how does it affect the equation of the effectiveness of our deterrent? Your statements about what is occurring, both in Russia policies and monetization, affects our policies, and I would like you to speak to that for a moment, please, Dr. Schneider.

Dr. SCHNEIDER. Thank you.

The Russian military doctrine and one of the, I think, the most dangerous aspects of it is that it was developed by Vladimir Putin when he was cabinet secretary, or actually NSC [National Security Council], the equivalent to the NSC secretary.

It involves on its face first use of nuclear weapons, in effect, preemptive use, in a variety of circumstances that we don't believe any Western political leader or any Member of Congress would consider using nuclear weapons in local wars, things that are relatively inconsequential.

Yet, Russian nuclear doctrine does that. That was revealed by the current secretary of their national security council, Mr. Patrushev, actually several times in 2009. The actual doctrine, as he described it, goes beyond the published version in 2000 or the revised version that was put out in 2010.

My concern about Russian nuclear doctrine is not that they are going to wake up one day and launch a nuclear first strike at us. It is that they see nuclear forces and nuclear threats as a way of achieving political clout that they cannot achieve otherwise because their economy is basically a basket case. They have one-tenth of our gross national product. They are not a superpower in any sense other than they have a massive nuclear capability.

They have made threats directly relating to U.S. military action before. For example, during Operation Iraqi Freedom in 2003, they staged a major nuclear exercise in the Indian Ocean, overt nuclear exercise, where they launch not only nuclear-capable, exclusively nuclear-armed, cruise missiles. Russian press, for example, reported a simulated attack, a nuclear attack on Diego Garcia. They announced a cruise missile attacks, nuclear-capable cruise missile attacks on an aircraft carrier. And there aren't too many aircraft carriers in the Indian Ocean other than, at that time, American aircraft carriers.

So this is the linkage of what the Russians are doing and their view of their own sort of great power status, which really can't be supported by the Russian economy, I think, is dangerous. I am afraid that, under some circumstances, they could box themselves into a corner, and they consistently oppose many U.S. policies. They consistently threaten the use of force. Matter of fact, during the week that they invaded Georgia, they made a nuclear threat, explicitly nuclear threat, against Poland.

I think this is a very dangerous thing, because the Russian military leaders are hearing from their most senior officials that it is safe and sensible to talk about nuclear strikes in minor conflicts. And there are a number of Russian journalists, by the way, who agree with what I am saying right now; although, overall, there is very strong support for nuclear weapons in Russia.

Thank you.

Mr. TURNER. Mr. Fisher, I am going to ask you to help us understand. Now that we have looked at the basis, China and Russia are modernizing. Our modernization program is just a plan. It is one that needs funding in order to be executed. We have a letter from General Chilton and Admiral Mullen that, you know, clearly states the United States is the only nuclear weapons state not currently modernizing its nuclear capabilities and supporting infrastructure, which we will include in the record.

[The information referred to can be found in the Appendix on page 85.]

Mr. TURNER. There are risks associated with that. In a prior hearing, I used the example that, you know, I have a 1964 Cadillac. I love it. I love to drive it. I would not want to rely on it. You know, I have modernized my transportation equipment, and we similarly have this concern of, we are relying on an aging infrastructure at a time when we see those that we want deter are modernizing.

Could you please describe to me, what are some of the risks associated with Russia and China continuing to do the research developing and deploying new nuclear weapons capabilities while we sit back and simply maintain our existing and aging nuclear weapons? And you know, this is obviously a very helpful perspective as we look to the current process of the fiscal year 2012 funding.

Mr. Fisher.

Mr. FISHER. Yes. Thank you, Mr. Chairman.

Concern number one would be that, as we enter or consider follow-on reductions in our numbers of nuclear warheads that we could, probably in this decade or certainly shortly within the next decade, cross a line in which China's rising number of delivered deployed warheads could not—perhaps not cross ours in number, but rise to a point that when you add the onset of ballistic missile defenses and expanded space warfare capabilities, would undermine in a very significant way our ability to deter Chinese aggression, especially on their periphery in Northeast Asia, on the Taiwan Strait.

Secondly, I am concerned with decisions that we have already taken. The decision to retire the tactical nuclear-armed Tomahawk cruise missile, essentially our only secure deterrent delivery vehicle is—that decision taken with very little fanfare or argument, to me, was taken in short consideration of the degree to which Chinese conventional anti-aircraft missiles and its modernizing air force is able to increasingly threaten our tactical nuclear—airborne tactical nuclear delivery that we appear to have decided to rely on.

My concern is compounded by China's propensity to take tactical and strategic advantage when it presents itself and to strike with very little warning. The examples of Mao's attack during the Korean War; the ability of the Chinese leadership to lull the Indian leadership and then attack them; the ability to have attacked Vietnam in 1979, when Vietnam was basically isolated, and there were—deep military losses, but Deng Xiaoping was able to change the strategic environment in Asia to his favor.

My concern is that even a small drawdown in an American capability could result in some degree of Chinese temptation that we

should be working to avoid. Just this past year, or early September, we discovered from recovered Libyan government documents how China was considering selling $200 million in arms to Moammar Gadhafi. What was the process that caused the Chinese to even consider this, which, to the surprise of many, they even admitted later, after those documents were released?

Was it because the United States deliberately decided to take a backseat in the coalition to support the Libyan rebels? For whatever reasons, that contributed to that decision, good or bad. There was this potential that we would have paid a real price in the terms of a Chinese attempt to extend the regime of Moammar Gadhafi.

Mr. TURNER. Mr. Fisher, I appreciate your answer then in summation is that deterrence is an equation of which imbalance has risk, and I appreciate that.

Dr. Lewis, in your written statement, you say there are no foreseeable scenarios under which either country could initiate the use of nuclear weapons against the United States, our forces abroad or our allies without suffering overwhelming destruction that would outweigh any possible gains. Deterrence against deliberate nuclear attack from Russia and China today is extremely strong.

I appreciate that statement because it recognizes really what the goals and objectives of this committee has been with respect to the issue of deterrence, and that is, you know, deterrence is something that is not an inherent capability. It is something that arises out of investment and research. Deterrent capability of today can decay and age, capabilities can be outdated and threats or needs change.

And in that change, you had—in an article that you had written in The Diplomat on September 23, my understanding is that you advocate modifying our existing B83 nuclear bomb, giving it an earth-penetrating capability, and therefore enabling it to hold at risk deeply buried underground facilities. Your article, I believe, suggests that the capability may be needed to deter North Korea's Kim Jong Il, who is building lots of underground facilities.

In the article, you are essentially putting forth the prospect of an existing bomb having a new capability. So when we look at modernization, we can look at modernization of having existing capabilities conducting a different mission. Your article, I believe, says that the B61–11 earth penetrator is ill-suited for certain North Korean underground targets that we need to hold at risk, and so we need the new capability perhaps by the B83.

This proposition is, in effect, modifying existing warheads giving the new capabilities—is, in effect, a modernization process, and I would like for you to comment on—because obviously, one of the things that we look at in that deterrence process is in modernization is what are our new capabilities that we need and how do we look at modifying so that we might be able to achieve them.

Dr. LEWIS. Let me start by saying I am in no way theological about these things. If there is a gap in deterrence, I would support filling it. And if things are unnecessary, then I would not support funding them.

In this particular case, this would be a modification of an existing weapon need and existing requirement. And so what was proposed was for Sandia National Laboratories to do a sled test that

would indicate whether or not this was a capability that would be feasible or not.

I believe it is entirely consistent with the policy outlined in the Obama administration's Nuclear Posture Review and if the sled test suggested that would work, that would be fine.

We envisioned that primarily as a North Korea-directed issue because there are apparently some targets in North Korea that may be difficult to hold at risk. But I think that in another context—for example, with Russia and China—such a capability would be of relatively little value given the kinds of numbers and forces.

Yes, we wrote that. It is designed to deal with a very specific problem in North Korea. I am not sure that that would help us much with the problems that I see with China and Russia, where I think deterrence is so robust that I am much more concerned about how things may go awry in a crisis.

Mr. TURNER. Well, my final question, and then I will be turning to my ranking member, and if that doesn't work, would, as you just identified the evolving risks associated with then what needs to be an evolving deterrent, permit us to build a purpose-built weapon that would address that if there is not an ability to modify our existing inventories?

Dr. LEWIS. Well, I don't want to speak for my co-author, but we agreed that the deterrent benefit one would get from something like this would be quite small. We just had a very simpleminded view. If there is a target, we should calculate the hardness and have something to hold it at risk.

But we set two red lines for ourselves. One red line was that we should not violate the policy against new nuclear weapons as outlined in the 2010 Nuclear Posture Review, and I believe we have stayed within that; and the second is that we would not proceed to explosive testing because I think in either case, the deterrent benefit, although real, would probably be in those two instances outweighed by the negative diplomatic cost of doing so.

Mr. TURNER. Ms. Sanchez.

Ms. SANCHEZ. Thank you, Mr. Chairman. Mr. Lewis, it is my understanding that when we look at a capability, we look at the weapon itself and then we look at the delivery system or the conjunction of the two.

So when I look at modernization, at least when I think of it, I think of modernizing both systems. Can you speak to whether you—I mean, you alluded earlier in your statement that the modernization of our submarine systems or the modernization of our other methods of deploying, that we continually modernize that.

Do you think that is enough or do you think we should be doing the type of modernizing that China and Russia are doing in some cases, and maybe doing even more behind a black curtain, let us say?

Dr. LEWIS. Well, let me start by saying I look at the problem in exactly the same way that you do. I would not want the United States to pursue the modernization path that the Chinese and the Russians have had. If we look at the way that they handle their nuclear weapons, in Russia you see this very clearly.

Russian nuclear weapons are manufactured with the expectation that they will last a very short period of time and so they must be

continually remanufactured which is, I think, not the ideal way to do this; whereas U.S. nuclear weapons were made with incredible resiliency and are capable of being life-extended.

And so if I have these two paths in front of me, I would certainly prefer the way the United States does it. And as I said in my statement, I would not swap the forces.

Ms. SANCHEZ. And I would ask this of all of you, starting with Mr. Lewis and then going down the line—it seems to me that if China or Russia were to make a quantum leap, if you will, in their nuclear capability aside from the delivery system, that we would somehow have to know about it because they would have to test it. Otherwise, I would assume—what little I know of physics, which I have many years of it by the way—but I would assume that they would just have to test it somehow, and that there is no way to hide that.

Is that a false assumption? In what way could they be modernizing the actual weapon and not have us realize it or see it or hear it, et cetera?

Dr. LEWIS. Yes, ma'am. You are not incorrect at all. I included in my testimony a chart prepared by the National Academy of Sciences that——

Ms. SANCHEZ. Yes, I saw of that.

Dr. LEWIS [continuing]. With the purposes of testing at various yields and I think that it is quite clear that neither Russia nor China, if they were to conduct tests that they could conceal, would be able to use those tests for anything that I think would be balance-altering, you know?

If you look at the examples, there are things, like, one-point safety tests which, although I don't want the Russians and the Chinese testing, I suppose if they are doing it for safety, that is certainly better than the alternative.

What fundamentally we have is, I think, a situation where all three states to sign the Comprehensive Nuclear Test Ban Treaty, China in particular is very constrained in its ability to put multiple warheads on its newest missiles without testing.

And so I have been a very strong supporter of ratifying that treaty, which I know was an issue before the Senate, but I just believe it is strongly in the United States interest to keep Russia and China from being able to test nuclear weapons since I believe that under the current moratorium we have a significant advantage over them and our ability to maintain and whether you call it modernize or modify our existing stockpile.

Ms. SANCHEZ. Mr. Fisher, what do you think?

Mr. FISHER. Congresswoman, my suggestion would be that, in regards to China especially, that it is as paramount to have all of our ears and eyes open. If there is a way to mask or divert attention from a nuclear test event, I would expect the Chinese to engage in that practice whether it be somehow modifying the sound waves that emerge from a test so that it would not appear to be the same kind of vibration that a nuclear explosion would yield.

I agree with Jeffrey that in terms of missile testing, especially for multiple warheads or advanced warheads, that would be something that we could observe for as long as we had the satellites to observe those tests.

But I think we should also consider that a Chinese standard for modernizing a warhead may not be what we would require and that it is at least conceivable that a degree of advanced computer simulation may suffice in some cases for modification of warheads that we might prefer to test.

Ms. SANCHEZ. Thank you, Mr. Fisher. Doctor.

Dr. SCHNEIDER. Thank you. I disagree in terms of the impact of the nuclear testing constraints on the ability of Russia to modernize its forces.

There is a very substantial literature ranging from high-level Russian governmental officials who have stated they were introducing new nuclear weapons. There is a very extensive press coverage of this which goes in more detail than the government officials do on exactly what they are doing in nuclear weapons modernization.

There are declassified CIA [Central Intelligence Agency] reports that are available on the Internet, fortunately highly redacted, but they clearly indicate the Russians are developing new low-yield nuclear weapons.

There is some fairly extensive reporting in the Russian press of the conduct of hydronuclear tests. Unfortunately, the atomic energy ministry does not share Mr. Lewis' view of the value of very low-yield testing, and I quoted that in my prepared statement. They think that it is very important to weapons development.

In addition to that, there is evidence, at least some—and including a report of the House Intelligence Committee of about 10 years ago—the Chinese may be testing nuclear weapons at very low yields.

I take these reports with a great deal of credibility because, again, you can get on the Internet and you can look at the declassified intelligence, mainly CIA reports.

Ms. SANCHEZ. But, Doctor, I am really getting to the—I understand what you are saying and I don't doubt anything you say. What I am asking is—I mean, here are people, CIA people, et cetera, who are saying we have seen it, we hear it, it is there, they are doing it or what have you. Whether it is in the mainstream of belief or not is different, but there is somebody spotting what is going on.

So my question is if they were going to make a fundamental difference to their weapon which would exceed our capabilities, would not somebody think they saw, think they heard it, think they felt it?

Dr. SCHNEIDER. Not necessarily, no.

Ms. SANCHEZ. Not necessarily? Do you think they could—is that because it is theoretical and they would build it anyway and they wouldn't test it or is that because they could test it and they could alter so much of the test that none of us could see or hear or feel it?

Dr. SCHNEIDER. There are serious limitations on our ability to detect nuclear tests. The debate on how high a yield you can go without detection is at least 1 to 2 kilotons with decoupling, and if you test in salt mines it may be up to 10 kilotons.

Even sub-kiloton nuclear tests—and I would suggest the committee review the JASON—not only the National Intelligence Esti-

mates that was done last year, but even on an unclassified basis, the JASON Report of 1995 where they talked about being able to do partial boosting at half-kiloton yield and extrapolate that to full boosted yield.

That would allow you to develop dramatically new nuclear high-performance nuclear weapons. And I believe you can go way above a half-kiloton with little risk of detection if you do decoupling or you test in salt mines.

Ms. SANCHEZ. Mr. Chairman, if you would allow me just one more question of our—I have so many, and I am just really trying to get some pearls of wisdom out of these guys.

What drives and what constrains current Chinese and Russian nuclear weapons modernization efforts?

Dr. LEWIS. I believe that the Chinese nuclear program is driven by a very straight desire to have the same technological capabilities, though not the same numbers, as Russia and the United States. So they will try to have at least 1 of whatever we might have 1,000 of. And I think further that both Russia and China, although this will sound very strange, do fundamentally fear the United States would use nuclear weapons first.

And I have spent a lot of time trying to explain to Chinese and Russian experts what a crazy view that is. But I think that that is the only thing that explains both Russia's very strange reliance on this Perimeter system, and the Chinese plan to put forces in the field as a kind of signal. So technology, and I suppose to some extent, fear.

Mr. FISHER. Congresswoman, my view is that nuclear weapons as well as broader range military modernization we are seeing in the PRC stems from the ultimate desire to pursue regime survival. In 1989——

Ms. SANCHEZ. Mr. Fisher, regime survival or rule of the world?

Mr. FISHER. All of this is designed to promote the survival of the Chinese Communist Party-led dictatorship. This is the ultimate goal that the PLA serves for the Communist Party. And the nuclear weapons modernization is pursued first and foremost with that goal in mind.

In my opinion it will proceed apace, a larger, broader, conventional modernization that is designed to increasingly advance and defend the interests of the Chinese leadership as they seek to defend interests in Asia, beyond the Asian periphery, and then globally into the next decade.

And in my opinion, the size and pace of nuclear modernization will be related to the degree to other aspects of China's broader conventional modernization.

Dr. SCHNEIDER. Thank you. I think in the case of Russia, nuclear weapons are very much a part its self-image as a great power. They have very little claim to anything else. That has been very explicitly stated by then-President Putin, of course future-President Putin, and then-Defense Minister Serdyukov. He is now a deputy prime minister and heads up the industrial part of their military complex.

In the case of China, I think nuclear weapons are very much part of their striving to obtain superpower status. You don't increase your defense budget by double digits for decades, which they have

done in the past and apparently to do so in the future, without having certain ambitions, you know, concerning the use of military force.

And I think nuclear weapons are a part of that. I expect a very large increase in Chinese nuclear weapons capability over the next two decades. It is going to be slow, but it is going to be steady, and in the end it is going to be very big.

Ms. SANCHEZ. None of you mentioned constraints. But I will just leave that. Maybe you can think about that and——

Thank you, Mr. Chairman.

Mr. TURNER. Thank you.

I just want to make one comment as a result of the testimony we have been receiving. During design, the expected life cycle of our weapons was somewhere between 10 and 15 years, it is my understanding. And the average age currently of our weapons is 26 years. So I think that that helps highlight the discussion that we are having here of the issue of the need for modernization of exceeding the expected design life cycle.

Mr. Lamborn.

Mr. LAMBORN. Thank you, Mr. Chairman.

Excuse me. Thank you all for being here. This is a really important discussion. Before I begin my questions, I would like to introduce into the record the executive summary from a study commissioned by the Defense Threat Reduction Agency. It is a comprehensive open-source assessment of the Chinese underground tunnel system.

The full study is due to be released soon, but at the request of this subcommittee a preview of the executive subcommittee has been provided. And I ask that the executive summary be made a part of the record.

Mr. TURNER. Without objection.

[The information referred to can be found in the Appendix on page 86.]

Mr. LAMBORN. And additionally, the Department of Defense's 2011 report on the Chinese military discusses the troubling development of the Chinese underground complex of tunnels. And I ask that, too, be made a part of the record.

Okay, thank you.

[The information referred to can be found in the Appendix on page 87.]

Mr. LAMBORN. Dr. Schneider, in its 2011 annual report on military developments in China just entered into the record, the DOD [Department of Defense] says that China has constructed and continues to expand a complex of underground tunnels, perhaps over 5,000 kilometers in length, to enable its nuclear forces to transport nuclear weapons undetected and to launch from a large number of locations.

What are the implications of this tunnel complex to the United States and our allies?

Dr. SCHNEIDER. It is almost mind-boggling. I knew they use what we call hardened deeply buried tunnel facilities to protect their strategic forces. But until recently I had no idea it was remotely that extensive. It has enormous implications in terms of their view

toward nuclear warfare, the survivability of their systems and their leadership in the event of war.

It is virtually impossible to target anything remotely like that, irrespective of how many nuclear weapons you have. And that is a concern when you put it in the light of some of the more fanatical statements that have been made over the years by Chinese generals about the, you know, nuclear warfare.

Including, you know, statements going back to the Mao era, and actually reiterated as recently as 2005 in Beijing about losing a few hundred million people being relatively insignificant, we will survive, and that sort of that stuff.

That is really crazy stuff. And you got to deter these guys. I very strongly support Mr. Lewis' suggestion of modifying the B83 into an earth or rock penetrator. That is a very important capability to have, not only for North Korea, but for Russia and China as well.

Thank you.

Mr. LAMBORN. And does this large underground complex make verifying the size and structure of China's nuclear forces more difficult? And if so, is this a very destabilizing factor?

Dr. SCHNEIDER. Well, yes. I mean, it certainly makes it far more difficult. The Chinese are using mobile ICBMs, which are inherently very difficult to verify. For example, when we went into the INF treaty with Russia, the Reagan administration said there was a dispute of several hundred missiles on how many intermediate range missiles the Russians actually had. And these are the type of mobilized—well, in that case mobile IRBM. But the difference between an ICBM and an IRBM is just a few meters in canister length. So basically, it is the same sort of thing.

We know a lot less about China overall than we know about the Russians in nuclear capability, if for no other reason that the Russians talk about it all the time, where the Chinese are fairly secretive. I think you can find deliberate leaks by the PLA in Hong Kong press. I think they are using that as a mechanism of debating some issues that they can't openly debate in China. But I suspect we are going to see a very large increase in Chinese capability, including extensive MIRVing.

That is alluded to in the case of the—you know, the possibility of that—in the case of the ICBM force in the latest version of the Pentagon report on Chinese military power. They are talking, I think, very clearly about the VF–21 program, which I believe Mr. Fisher mentioned previously, has the potential for 10 warheads.

Mr. LAMBORN. And with the tunnel complex, they could be increasing the size of their stockpile with us not even knowing it?

Dr. SCHNEIDER. Yes, obviously; quite frankly, yes. They have the resources, they have got the technology. As a matter of fact, yesterday I found a very interesting statement by Yuri Solomonov, who is the chief Russian ICBM solid fuel designer. He once headed up their design bureau, MITT [Moscow Institute of Thermal Technology].

And he said they were 15 years behind the Russians in missile technology. Now, 15 years ago this is post-cold war and they were introducing the SS–27. That is a very significant statement on his part. And he said he expected them to come up to 5 to 10 years behind the Russians. That is a very significant development.

Mr. LAMBORN. All right. Thank you.

Mr. Fisher, the Obama administration has made unilateral declarations that there are certain conditions under which nuclear arms would not be used, conditions that had not been so limited previously.

Have the Russians or the Chinese made any reciprocal limiting declarations in response to the Obama concessions?

Mr. FISHER. Not that I am aware of, sir. The Chinese, who I am most familiar with—they have a long history of statements about their "no first use" policy, and how that is understood. And, in turn, doubted because of conflicting Chinese statements especially over the last two decades. But I am not aware of any specific Chinese statement in response to the Obama statement, other than a——

Mr. LAMBORN. Or Russian?

Mr. FISHER. No.

Mr. LAMBORN. And with the passage of New START, did the Chinese react in any way? For instance, have they decelerated any of their modernization efforts?

Mr. FISHER. Not to my knowledge, sir. I think that it continues apace. We may see the emergence of a Chinese triad within this decade. A new continental range bomber, multiple MIRVed missiles, perhaps a follow-on class of SSBN after the Type 094, not to mention missile defense advances, advances in new IRBMs and in space warfare capabilities.

Mr. LAMBORN. Well, to me the power of example is very limited for those who are relying on that. And for Dr. Lewis, what is the view of China and Russia to each other as a potential nuclear adversary? And are any of their forces or defenses dedicated to the other country?

Dr. LEWIS. Yes. Yes, they are quite worried and, one might even say, paranoid about one another. A significant percentage of the things that the Chinese have done when it comes to modernizing their forces seem to be Soviet and then Russia oriented. So for example, they spent considerable time making sure that their ICBMs, which we often think of as being pointed at us, were capable of penetrating the Moscow ABM [anti-ballistic missile] system. There is a very significant fear there that makes it very complicated as we try to engage with both countries.

I will say one other thing, which is the Russians in particular are quite taken with this tunneling argument. And it just goes to illustrate I think the depth of the mutual hostility because I and a colleague have been looking into the tunneling issue. And it is very interesting. One of the questions we had was where would all the plutonium for the warheads have come from? Because they only have the two production reactors.

And it turns out one of the citations, which is in Chinese, is a teenage girl's blog, which is in and of itself a repetition of an English language Usenet discussion from the mid 1990s where a guy posting anonymously because he didn't want his wife to know what he was doing just was making up some numbers. I think the fact that I hear these numbers repeated by Russian experts really just demonstrates the depth of paranoia on both sides.

Mr. LAMBORN. And lastly, Mr. Fisher, would you like to comment on the Chinese tunnel complex issue?

Mr. FISHER. Congressman, I share the concern of my colleagues very much. The existence of this vast tunnel network to me raises the immediate question of, "Do we really know how many missiles do the Chinese have today?" The normally accepted number that goes into the annual Pentagon PLA reports of 20 DF–5s strikes me as unrealistic given not only the existence of this tunnel complex where they can be hidden, but also the fact that production of this missile can easily be facilitated by existing space launch vehicle production lines. And that these production lines have been churning away since the 1980s. I put into my written testimony an illustration of what I believe are dismantled DF–5 fuselages on horizontal trolleys within one of these tunnel complexes. The image was released in 2006 by the Chinese. And it to me just illustrates this question very clearly.

Thank you.

Mr. LAMBORN. Thank you, Mr. Chairman. I yield back.

Mr. TURNER. Well thank you. I want to thank each of our witnesses today. As you know, this is part of our overall effort to get a grasp of not only the countries that we are looking at for our deterrence, but also looking at their modernization programs as it affects our policies. This will be followed by classified briefings for this committee where we can take some of the open source information and correlate to what is known by our intelligence gathering. So thank you for being here, and we greatly appreciate your efforts and diligence on this issue.

[Whereupon, at 12:53 p.m., the subcommittee was adjourned.]

# A P P E N D I X

OCTOBER 14, 2011

## PREPARED STATEMENTS SUBMITTED FOR THE RECORD

OCTOBER 14, 2011

**Opening Remarks**
**Honorable Michael R. Turner**
**Chairman, Subcommittee on Strategic Forces**
**House Armed Services Committee**

**Hearing on "Nuclear Weapons Modernization in Russia and China: Understanding Impacts to the United States"**

**October 14, 2011**

Good morning. I want to welcome everyone to the Strategic Forces Subcommittee's hearing on Nuclear Weapons Modernization in Russia and China: Understanding Impacts to the United States.

This hearing is very timely, because we're currently faced with a highly uncertain future regarding our own nuclear deterrent modernization program. Despite commitments from many key leaders that modernization of our nuclear weapons stockpile, delivery systems, and supporting infrastructure is critically needed, we're on the verge of halting our modernization program before it even begins. The FY12 Energy and Water appropriations bills currently in Congress would make dramatic cuts to nuclear modernization funding levels that were agreed to last year by the President and Senate during consideration on the New START Treaty.

In that context, it is important to understand if and how other countries—especially China and Russia—are modernizing their nuclear forces, and how that modernization should impact our decisions here in the United States.

To help us explore these issues, we have before us several distinguished, nongovernmental experts on nuclear weapons programs, strategy, and forces in China and Russia. They are:

- Dr. Mark Schneider
  Senior Analyst
  National Institute for Public Policy

- Mr. Richard Fisher, Jr.
  Senior Fellow
  International Assessment and Strategy Center

- Dr. Jeffrey Lewis
  Director, East Asia Nonproliferation Program
  James Martin Center for Nonproliferation Studies, Monterey Institute of International Studies

Thank you all for joining us today—we appreciate you sharing your insights with us.

Based on your written statements, you all seem in agreement that Russia and China are modernizing their nuclear forces. Dr. Schneider, you point out that "Russia is modernizing every leg of its nuclear triad with new, more advanced systems," including new ballistic missile submarines, new heavy ICBMs carrying up to 15 warheads each, new shorter-range ballistic missiles, and new low-yield warheads. You highlight a series of disturbing statements by senior Russia officials regarding how Russia has come to put increased emphasis on its nuclear weapons in military planning, including a possible intention to use nuclear weapons first, in an attempt to end regional- or even local-level conventional wars. Dr. Schneider, you also reference information that Russia may possibly be violating the Intermediate Nuclear Forces Treaty. If true, this is deeply disturbing. I hope you will discuss this in your summary remarks.

Mr. Fisher, you point out that China is steadily increasing the numbers and capabilities of the ballistic missiles it deploys, and is upgrading older ICBMs to newer, more advanced systems. China also appears to be actively working to develop a submarine-based nuclear deterrent force, something it has never had. Your testimony also highlights reports of a very large tunnel system China has constructed. A recent unclassified Department of Defense report says this network of tunnels could be in excess of 5,000 kilometers, and is used to transport nuclear weapons and forces. An unclassified study commissioned by the Defense Threat Reduction Agency, and conducted by Dr. Phillip Karber at Georgetown, is about to be released which goes into even greater detail on this worrying development. As we strive to make our nuclear forces more transparent, China is building this underground tunnel system to make its nuclear forces even more opaque.

Dr. Lewis, from your prepared statement it appears that while you agree with your fellow witnesses that China and Russia are modernizing, you likely don't agree with them on what the implications of that modernization are for the United States and our decision-making. But you do caution that some of the modernization efforts in China and Russia could lead to instability in a crisis. In particular, I would appreciate it if, in your opening statement, you would touch on the stability

implications of deployment of a heavy, multiple warhead, fixed-silo based ICBM in Russia, as well as China's nuclear force concept of operations—which requires arming their nuclear delivery systems in a crisis.

With all of this modernization going on in Russia and China—and every other nuclear power—our own nuclear modernization program may never get past the "plan" stage. Last December, President Obama and the Senate agreed to robust funding for nuclear modernization efforts. In letters to the Senate, President Obama agreed to modernize the strategic triad of delivery systems and accelerate key infrastructure projects at NNSA labs and plants. The President also said:

- "I recognize that nuclear modernization requires investment for the long-term, in addition to this one-year budget increase. That is my commitment to the Congress—that my Administration will pursue these programs and capabilities for as long as I am President."

The President came through on this pledge in his budget request, and then the House supported full funding for NNSA in the FY12 Budget Act and the FY12 National Defense Authorization Act. But now that commitment is falling apart—the FY12 Energy and Water appropriations bills would cut NNSA funding by up to 10% from the budget request, and the current continuing resolution returns NNSA to 1.5% less than FY11 levels.

In the House, 65 Members signed onto a letter—one that contains gross inaccuracies about the cost of sustaining and modernizing our stockpile—calling for $200 billion in cuts to nuclear weapons funding over ten years. Considering that the budget for sustaining, operating, and modernizing our nuclear weapons complex and nuclear forces is on the order of $220 billion over the next ten years, these cuts would amount to unilateral disarmament. I was disappointed to see so many of my colleagues sign onto such an irrational proposal.

But I am thankful that all of my majority colleagues on this subcommittee are standing firm on the need for modernization. We recently sent a letter to four key Senate appropriators, asking them to stand by a written commitment the senators made to the President last December, in which they each pledged their "support for ratification of the New START Treaty and full funding for the modernization of our nuclear weapons arsenal."

No less an authority than the Secretary of Defense supports fully funding NNSA's nuclear modernization efforts. Just yesterday, in testimony before our

committee, Secretary Panetta said he "certainly would oppose any reductions with regards to the funding for nuclear [modernization]". This is a strong statement of support from a Secretary who is under intense pressure to cut defense spending.

Secretary Panetta also said at yesterday's hearing:

- "With regard to reducing our nuclear arena, I think that is an area where I don't think we ought to do that unilaterally; we ought to do that on the basis of negotiations with the Russians and others to make sure that we are all walking the same path."

I couldn't agree more. That is why one of the New START Implementation Act provisions contained in the House-passed FY12 NDAA link would ensure that we don't unilaterally reduce, and that any further reductions occur in conjunction with a formal treaty or an act of Congress.

Today, we are going to examine nuclear modernization efforts in Russia and China. We need to understand what these countries are doing, in contrast to what we are doing. Our nuclear modernization plan is just that—a plan. We are only beginning to embark on it. Meanwhile, these other countries continue to advance the capability and reliability of their nuclear forces. We need to understand the potential long-term consequences of watching as Russia and China modernize their nuclear arsenal—while we sit back and simply maintain our existing and aging nuclear forces.

With that, let me turn to our Ranking Member, Ms. Sanchez, for any opening comments she would like to make.

**Opening Statement**
**Strategic Forces Subcommittee Hearing on**
**Modernization of Russian and Chinese Nuclear Weapons Programs**
**Ranking Member Loretta Sanchez**
**October 14, 2011**

I join Chairman Turner in welcoming Dr. Schneider, Mr. Fisher and Dr. Lewis to this hearing on modernization of Russia and China's nuclear weapons programs and what the impact is for U.S. nuclear policy and posture.

This is an issue that has been of interest to this Subcommittee and this hearing a useful follow-on to the classified briefing that our Subcommittee received on foreign nuclear weapon programs earlier this summer.

This is a valuable opportunity to gain a better understanding of:

- the extent of current and planned modernization efforts, what drives these efforts and what the constraints might be
- the different models that are being used for maintaining nuclear weapons
- how these modernization plans add to Russian and Chinese capability and what they mean for the future trends of these arsenals
- how they impact our deterrence requirements
- whether and how they might affect the modernization of our own nuclear arsenal as we ensure that we retain a strong and credible deterrent through maintaining a safe, secure and reliable arsenal, even as we aim for lower levels—down from the thousands of U.S.

and Russian nuclear weapons that still account for over 95% of the world's nuclear weapons

Given these efforts, what can we do to best make progress to reducing the dangers posed by nuclear weapons.

In this context, I look forward to hearing your views particularly on:

- How we can most effectively decrease the risk that nuclear weapons might be employed as a result of accidental or unauthorized launch;

- On whether multilateral measures such as the Comprehensive Test Ban Treaty could help stem foreign nuclear weapons modernization;

- And on what must be done to preserve and strengthen strategic stability vis-à-vis Russia and China.

Thank you for sharing your expertise with our Committee and for helping to inform the public debate on these important issues for national and international security.

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United States House of Representatives House Armed Services Subcommittee on Strategic Forces

The Nuclear Forces and Doctrine of the Russian Federation and the People's Republic of China

October 14, 2011

Testimony Prepared By:

Dr. Mark B. Schneider

Rayburn House Office Building

Room 2212

PREPARED STATEMENT

Nuclear weapons and strategic nuclear strike capability are the highest military priority of the Russian Federation. Russia is modernizing every leg of its nuclear TRIAD with new, more advanced systems. Under New START, Russia has declared 1,537 nuclear warheads and 521 and delivery systems.[1] However, since New START undercounts bomber weapons, the actual number could be about 800 warheads higher.[2] The number of Russian weapons and delivery vehicles will probably decline over the next five years, but Russia has vowed to build up to both the New START limit on deployed warheads and deployed delivery vehicles by 2018 and 2028, respectively.

In 2011, Russia announced a three-fold increase in nuclear missile production. Russian press reports indicate plans to deploy 200-300 mainly MIRVed SS-27/RS-24 ICBMs. The new Bulava 30 SLBM will be operational in 2012. Russia says it plans eight new Borey class submarines to carry this missile. It is also reportedly developing a fifth generation missile submarine to carry both ballistic and cruise missiles. An improved Sineva SLBM, the Liner with up to 12 warheads, the Arbalet SLBM, probably another program to upgrade the Sineva and a mystery missile called the Avangard (one Russian source suggested it may be a rail mobile ICBM), were all made public in 2011. This year the Russian government announced the deployment in 2018 of a new heavy ICBM which reportedly will carry 10-15 warheads. Russia is also in the early stages of the development of a new bomber and is deploying a new very long range nuclear cruise missile. In September 2011, Russia unsuccessfully tested an upgraded SS-27/RS-24 with more throw-weight to allow for six warheads and missile defense counter measures, new warheads and a new MIRV dispensing bus. Some Russian press reports have suggested it is the Avangard. In 2016, according to the SS-27 designer, Russia will deploy new warheads on the SS-27 variants.

In April 2011, Gary Samore, a Senior Director on the National Security Council Staff, stated that Russia "probably" has "a few thousand [tactical] nuclear weapons" compared to a "few hundred" for the U.S.[3] The Russian tactical nuclear force reportedly consists of short range missiles, nuclear artillery, nuclear landmines, nuclear air defense missiles, nuclear naval missiles and bombs, nuclear depth charges, antisubmarine warfare missiles, nuclear torpedoes, and nuclear bombs and missiles of the Air Force's and Navy's non-strategic aviation. The new Iskander short range ballistic missile and the new Su-34 fighter are reportedly nuclear capable.

There are reports in the Russian press that the R-500 ground-launched cruise missile of the Iskander system has a range of 1,000-3,000-km, which is prohibited by the INF Treaty.[4]

In 2005, Russia's Defense Minister Sergei Ivanov said Russia was developing and deploying "new" types of nuclear weapons. Colonel General Vladimir Verkhovtsev, then-chief of the Defense Ministry's 12th Main Directorate which handles Russian nuclear weapons, said Russia is deploying "***new nuclear weapon*** complexes....***that possess improved specifications and performance characteristics***..."[5] (Emphasis added). Former Russian Atomic Energy Minister Viktor Mikhaylov stated in a 2002 *Izvestiya* interview that Russia was working on a low-yield warhead to penetrate 30–40 meters into rock and destroy a buried target. The new weapons reportedly range from small and light strategic weapons with a high yield-to-weight ratio to "clean" nuclear weapons. On its SLBMs, Russia has reportedly deployed precision nuclear weapons with yields of 50-200 tons of TNT. In April 2009, Vice Admiral Oleg Burtsev, then-Deputy Chief of the Naval Staff, stated that Russia could install low-yield warheads on existing cruise missiles.

To develop new nuclear weapons, the Russian press reported that President Boris Yeltsin authorized hydronuclear (very low yield) tests in 1999. Hydronuclear testing reportedly began as early as 1994. According to the Russian Ministry of Atomic Energy, hydronuclear tests "played an important role in the analysis of the safety and ***reliability of nuclear weapons***."[6] (Emphasis added). In November 2010, Alexei Fenenko of the Russian National Academy of Scientists wrote that over the past 15 years, "significant progress" was made in hydronuclear testing.

These developments related to the new Russian nuclear doctrine that then-acting President Vladimir Putin signed into law in the year 2000. It featured the lowest nuclear weapons use threshold of the nuclear powers. In 2009, Russian National Security Council

Secretary Nikolai Patrushev revealed that the doctrine allowed for first use of nuclear weapons in regional and ***local*** conventional war, which was not evident on its face.

In February 2010, Russia released a new military doctrine. Like the 2000 version of the doctrine, it reserves the right of nuclear retaliation against nuclear, chemical and biological attack. It also provided for the first use of nuclear weapons in conventional warfare. Last year the public formulation of Russia's nuclear weapons first use policy in conventional warfare was changed. The condition of "situations critical for national security" was altered to read "that would put in danger the very existence of the state." On its face this would be a favorable development, but this is not clear. In fact, Deputy Prime Minister Sergei Ivanov stated that on nuclear weapons use the 2010 version does not differ from the year 2000 version. This may be reflected in the content of the secret Russian document entitled "Basic Principles of State Nuclear Deterrence Policy to 2020."[7]

Both the year 2000 and 2010 nuclear doctrines involve a nuclear escalation strategy in which the first use of nuclear weapons is characterized as "de-escalation" of the conflict. There is a dangerous assumption by Russian leaders that the use of a few nuclear weapons will automatically end in conflict termination and a Russian victory.

Russia's doctrine on the first use of nuclear weapons is dominated by more than conventional military weakness. Russia sees the threat of first use of nuclear weapons as a means to increase Russia's political clout. The Russian press routinely reports that Russia is conducting regional military exercises involving simulated nuclear weapons strikes against the U.S., NATO and China. In December 2009, Lieutenant General Andrey Shvaychenko, then-Commander of the Strategic Missile Force, stated that, "In a conventional war, they [the Strategic Nuclear Forces] ensure that the opponent is forced to cease hostilities, on advantageous

conditions for Russia, by means of single or multiple preventive strikes against the aggressors' most important facilities. In a nuclear war, they ensure the destruction of facilities of the opponent's military and economic potential by means of an initial massive nuclear missile strike and subsequent multiple and single nuclear missile strikes."[8] In a major strategic exercise conducted in 2010, Russia reportedly simulated hundreds of missile launches and one Russian media report stated, "Throughout the world, the mushroom clouds rose skyward."[9]

Since February 2007, Russia has made unprecedented nuclear threats, including about 15 nuclear targeting and preemptive nuclear attack threats emanating from the highest levels of the Russian government. Then-President Putin made four of them. Moreover, there have been numerous threats to forward deploy nuclear weapons and nuclear capable Iskander missiles, terminate arms control agreements, and launch an arm race. Notably, in 2007, Putin began flying nuclear bombers into U.S., NATO and Japanese air defense identification zones as well as occasional over-flights. The clear intent of these activities is nuclear intimidation.

If Russia's missile programs are ambitious, China's are even more so. The PRC is the only nuclear power that is currently increasing its strategic nuclear forces, both qualitatively and quantitatively. The Director of National Intelligence General (ret.) James Clapper has said that China's nuclear forces are a "mortal threat" to the United States. Indeed, China is preparing for a war against Taiwan, which it believes may require it to fight the United States and possibly Japan. While China would certainly prefer "winning without fighting," Chinese generals have threatened nuclear war over Taiwan. Moreover, Chinese objectives go well beyond Taiwan.

According to the Pentagon, China is deploying two new ICBMs (DF-31 and DF-31A), a new SLBM (JL-2), and a new missile submarine and at least six will reportedly be deployed. Today, according to the Pentagon report on Chinese military power, China has between 55-65

ICBMs. The extent of the deployment of multiple warheads (MIRVs) on its new missiles will have an enormous impact on the size of the Chinese strategic force 10-20 years into the future. According to the most recent Pentagon report on Chinese military power, the PRC may be developing a new road-mobile ICBM, "possibly" capable of carrying a multiple independently targetable warhead (MIRV). This is apparently the missile that is referred to as the DF-41 in the Asian press. *Jane*'s reports it may carry up to 9-10 warheads. There are reports in the Asian press that China plans to heavily MIRV its SLBMs -- as many as 576 warheads on six submarines -- although no time frame is reported. Republican Senators on the Foreign Relations Committee in the Committee report on New START estimated that the Chinese nuclear force would grow to 500-1000 weapons in the next decade. In addition to strategic systems, China has a variety of medium and intermediate range ballistic missiles. *Aviation Week* reports that China has announced that its new 4,000-km range ballistic missile will be nuclear capable.

Chinese nuclear doctrine is hidden beneath significant quantities of political propaganda, most notably a pledge of "no first use" of nuclear weapons. A careful look at the Chinese wording of China's "no first use" policy reveals that it commits them to nothing. The Pentagon report on the Chinese military states that "there is some ambiguity" over the conditions under which China's No First Use policy would apply, "including whether strikes on what China considers its own territory, demonstration strikes, or high altitude bursts would constitute a first use."[10] The *Kyodo New Agency* revealed that it obtained classified Chinese documents which say that China "will adjust the nuclear threat policy if a nuclear missile-possessing country carries out a series of air strikes against key strategic targets in our country with absolutely superior conventional weapons..."[11] Chinese generals also threaten nuclear attacks against the U.S. if it comes to the aid of Taiwan. China's Arms Control Ambassador once said that "no first

use" does not apply to Taiwan. Chinese nuclear doctrine has evolved toward "active defense," which has a nuclear warfighting component.

China prepared for the cessation of high-yield nuclear testing by staging a series of tests in the 1990s. A declassified June 1994 *National Intelligence Daily* article said that China was developing new nuclear weapons that "may use more advanced concepts such as aspherical primaries and possibly a type of IHE [Insensitive High Explosive]."[12] Xue Bencheng, one of the most important scientists involved in the development of China's neutron bomb, stated that the July 1996 Chinese nuclear test was "a great spanning leap" because it solved the problem of nuclear weapons miniaturization. China's nuclear weapons technology has been augmented by large scale espionage against the United States. It includes fairly advanced thermonuclear warheads, enhanced radiation weapons, and other tactical nuclear weapons, including nuclear artillery and antiship weapons.[13]

The House Intelligence Committee concluded that after the declared end of Chinese nuclear testing, "nuclear tests related to development of the PRC's next generation of thermonuclear warheads may be continuing at the PRC test site at Lop Non Nor."[14] In May 2006, *Chinese Defense Today* also reported possible "low yield nuclear tests" after the declared end of testing.

While the number of Russian and Chinese nuclear weapons differ greatly, there is substantial similarity between Russian and Chinese nuclear strategy. However, there is little similarity with U.S. nuclear strategy. Both China and Russia are improving their nuclear strike capability and both of them are willing to use nuclear weapons first. In February 2007, then-Defense Minister, Sergei Ivanov flippantly told the Duma that, "As regard to use of nuclear weapons in case of aggression, of course [it will use them in this case]. What else were they

built for?"[15] Russian commentator Alexander Golts points out that to the Russian leadership, "It is fundamentally important that the partners would believe that the occupants of the Kremlin are a tad insane and that they are ready to push the button."[16] The core of Chinese strategy is even worse because it is linked to Mao's far more extreme views about acceptability of hundreds of millions of dead. In 2005, Chinese Major General Zhu Chenghu threatened nuclear first use against the United States in which, "We Chinese will prepare ourselves for the destruction of all of the cities east of Xian....Of course, the Americans will have to be prepared that hundreds of cities will be destroyed by the Chinese."[17] No Western political or military leaders talk like this. Will they act on such a basis in a crisis? I can't get into their heads and neither can anyone else.

The current U.S. "modernization" plan involves essentially no significant nuclear modernization for almost the next twenty years. Even if we remain at New START levels, without modernization for 20 years, our deterrent and extended deterrence capability will decline as our TRIAD ages. Worse still, senior leaders of the Obama administration are talking about unilateral reductions in our nuclear weapons and eliminating a leg of the TRIAD. Yet, each element of the TRIAD has different attributes which maximizes deterrence. ICBMs are the most secure, alert (99%) and responsive, bombers the most flexible and missile submarines the most survivable. Elimination of the ICBMs would reduce the number of U.S. nuclear targets for the Chinese from 455 to 5. Without testing, the reliability of the remaining U.S. nuclear weapons may decline while Russia and China are apparently benefiting from hydronuclear testing.

With regard to Russia, there are a disturbing number of potential attack options where we have no proportionate response capability due to the precision low yield and tactical nuclear weapons asymmetry. In addition, the U.S. now has one of the weakest declaratory policies in the world concerning deterrence of chemical and biological weapons attack which may in the long

run precipitate a proliferation cascade. There are safer national security strategies that the U.S. could pursue.

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## Mark B. Schneider

**Senior Analyst**

Dr. Mark Schneider is a Senior Analyst with the National Institute for Public Policy. He joined the staff of the National Institute in September 2004 after his retirement from the Defense Department Senior Executive Service. While at the National Institute, Dr. Schneider provided on-site support to the Defense Policy Analysis Office of the Under Secretary of Defense for Intelligence. He also serviced as Special Assistant for Arms Control in the Office of Nuclear and Missile Defense Policy, Office of the Under Secretary of Defense for Policy under a Intergovernmental Personnel Act assignment. He specializes in missile defense policy, nuclear weapons, deterrence, strategic forces, arms control, and arms control verification and compliance issues.

Before his retirement from the Department of Defense, Dr. Schneider served in a number of senior positions within the Office of Secretary of Defense for Policy including Principal Director for Forces Policy, Principal Director for Strategic Defense, Space and Verification Policy, Director for Strategic Arms Control Policy and Representative of the Secretary of Defense to the Nuclear Arms Control Implementation Commissions. He also served in the senior Foreign Service as a Member of the State Department Policy Planning Staff, the Professional Staff of the Senate Select Committee on Intelligence, the Department of Energy, the Energy Research and Development Administration and the Atomic Energy Commission. Prior to his government career, Dr. Schneider served as a Senior Political Scientist with the BMD Corporation, a policy analyst with the Stanford Research Institute and taught at the University of Southern California and California State University at Los Angeles.

Dr. Schneider served as a member of the DoD Compliance Review Group. He chaired several working groups of the START and INF Treaty Implementation Commissions (JCIC and SVC) in Geneva, negotiating many implementation agreements with the successor states of the former Soviet Union. He served as Acting Chairman of the U.S., Russia Working Group on Missile Defense.

Dr. Schneider earned his Ph.D. in history at the University of Southern California and Juris Doctorate from George Washington University. He was admitted to the Bar of Washington DC in 1977 and Maryland in 1978.

Dr. Schneider has been awarded two Presidential Rank Awards of Meritorious Executive in the Senior Executive Service, two Secretary of Defense Distinguished Civilian Service Medal and two Secretary of Defense Meritorious Civilian Service Medals.

Dr. Schneider is the author of many articles, book reviews and book chapters on arms control, Russian and Chinese nuclear forces and doctrine, nuclear deterrence, strategic forces and intelligence issues.

**DISCLOSURE FORM FOR WITNESSES**
**CONCERNING FEDERAL CONTRACT AND GRANT INFORMATION**

**INSTRUCTION TO WITNESSES:** Rule 11, clause 2(g)(5), of the Rules of the U.S. House of Representatives for the 112th Congress requires nongovernmental witnesses appearing before House committees to include in their written statements a curriculum vitae and a disclosure of the amount and source of any federal contracts or grants (including subcontracts and subgrants) received during the current and two previous fiscal years either by the witness or by an entity represented by the witness. This form is intended to assist witnesses appearing before the House Armed Services Committee in complying with the House rule. Please note that a copy of these statements, with appropriate redactions to protect the witness's personal privacy (including home address and phone number) will be made publicly available in electronic form not later than one day after the witness's appearance before the committee.

**Witness name:** Mark B. Schneider

**Capacity in which appearing:** (check one)

_x__Individual

___Representative

**If appearing in a representative capacity, name of the company, association or other entity being represented:**

**FISCAL YEAR 2011**

| federal grant(s) / contracts | federal agency | dollar value | subject(s) of contract or grant |
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**FISCAL YEAR 2010**

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**FISCAL YEAR 2009**

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**Federal Contract Information:** If you or the entity you represent before the Committee on Armed Services has contracts (including subcontracts) with the federal government, please provide the following information:

Number of contracts (including subcontracts) with the federal government:

Current fiscal year (2011):_____;
Fiscal year 2010:_____;
Fiscal year 2009:_____.

Federal agencies with which federal contracts are held:

Current fiscal year (2011):_____;
Fiscal year 2010:_____;
Fiscal year 2009:_____.

List of subjects of federal contract(s) (for example, ship construction, aircraft parts manufacturing, software design, force structure consultant, architecture & engineering services, etc.):

Current fiscal year (2011):_____;
Fiscal year 2010:_____;
Fiscal year 2009:_____.

Aggregate dollar value of federal contracts held:

Current fiscal year (2011):_____;
Fiscal year 2010:_____;
Fiscal year 2009:_____.

**Federal Grant Information:** If you or the entity you represent before the Committee on Armed Services has grants (including subgrants) with the federal government, please provide the following information:

Number of grants (including subgrants) with the federal government:

Current fiscal year (2011):_____;
Fiscal year 2010:_____;
Fiscal year 2009:_____.

Federal agencies with which federal grants are held:

Current fiscal year (2011):_____;
Fiscal year 2010:_____;
Fiscal year 2009:_____.

List of subjects of federal grants(s) (for example, materials research, sociological study, software design, etc.):

Current fiscal year (2011):_____;
Fiscal year 2010:_____;
Fiscal year 2009:_____.

Aggregate dollar value of federal grants held:

Current fiscal year (2011):_____;
Fiscal year 2010:_____;
Fiscal year 2009:_____.

**Testimony before the House Armed Services Subcommittee on Strategic Forces -- "Nuclear Weapons Modernization in Russia and China: Understanding Impacts to the United States," October 14, 2011**

***Questions Regarding China's Future Strategic Nuclear Capabilities***
**By Richard D. Fisher, Jr., Senior Fellow, International Assessment and Strategy Center**

Chairman Turner and Distinguished Members of this Committee:

It is a privilege to provide testimony to guide this Committee's deliberations on one of the most vexing challenges to the security of the United States: how to assess the future strategic nuclear capabilities of the People's Liberation Army (PLA) of the People's Republic of China (PRC), and how to plan for U.S. strategic capabilities that will ensure deterrence of PRC nuclear aggression and coercion against the United States, its allies and its friends. I would suggest to this Committee that even considering the current dire budgetary environment, this is one challenge that allows for no margin of error in the American response. After two decades of massive military investments the PRC leadership may be entering a phase where its assessment of an American relative decline could embolden new levels of aggression, perhaps against Taiwan, against the U.S. strategic position in Asia, or in support of its gathering network of client dictatorships – or all three of these.

Nuclear missile force modernization and growth in the PLA's Second Artillery and PLA Navy are occurring at the same time that the PLA is developing ballistic missile defense (BMD) and space warfare capabilities, which hold the potential in the next decade to undermine the credibility of U.S. nuclear deterrent forces. In this current decade, the growth of the PLA's medium range nuclear and non-nuclear missile forces, plus the PLA's rapidly expanding conventional air, naval and Special Forces strike capabilities, will place an increasing burden on U.S. nuclear and conventional deterrent capabilities. It is also necessary to consider the potential for Russia to join China in nuclear coercion strategies directed against the United States. Furthermore, the United States could face new direct or indirect nuclear threats abetted by China's proliferation of nuclear and missile technology to North Korea, Pakistan and Iran. China and its nuclear proxies have no interest in a "world without nuclear weapons" and deterring the range of nuclear and missile threats they can generate will not be accomplished by an aging U.S. strategic force of fewer weapons and fewer types of weapons.

Mr. Chairman, while it is most commendable that this Committee address these issues from an open source perspective, it must be stated that these sources are largely insufficient to assemble definitive conclusions about the PRC's strategic nuclear force posture, modernization or the strategies underlying their growth. It is understood that similar constraints inhibit the intelligence community's assessments on the subject as well. It is the policy of PRC government to deny essential information about its nuclear strategic forces to all outsiders; it refuses to provide basic government documents describing its nuclear forces or their modernization plans, and it also refuses to engage in substantive discussions on its strategic nuclear intentions with the U.S. government. Chinese government White Papers on National Defense provide only a minimum understanding of PRC nuclear weapons policies and strategies. There is a much larger body of "grey" data ranging from cryptic comments by Chinese officials, papers by or interviews of

unofficial Chinese academics on policy and technical matters, to a growing body of actual imagery of strategic systems. This deficit of official open source data from the PLA means that questions will dominate this testimony.

This aversion to transparency by the PLA is not limited to nuclear issues, but applies broadly and is a key component of a centuries old Chinese strategic culture that prizes deception. It is in this light that one should view China's declared or described nuclear policies. Its oft-declared "No First Use" policy for nuclear weapons should be compared to a large body military literature favoring strategies of "preemption." China's at times vociferous diplomatic campaigns against missile defenses and space warfare since the 1980s have not included admissions that China has been developing both capabilities since the early 1990s. It is therefore reasonable to question whether the PLA will always pursue what has been described as a "minimum deterrent" strategy of a relatively small nuclear force. As the PLA seeks to fulfill new "Historic Missions" dictated by Chinese Communist Party (CCP) leadership to defend its international interests, by building global power projection naval, air and airmobile army forces, why should the PLA maintain only a "minimum" strategic nuclear force?

All of this serves to heighten the importance of declassified U.S. government assessments in aiding the U.S. and international public understanding of the PLA's strategic nuclear intentions. Congressionally mandated annual Department of Defense reports on the PLA have become the most credible source of facts about the PLA offered by any government, which is why the PRC government regularly demands a halt to their publication. But these reports could do a far better job of warning the Congress and the nation regarding developments in China's nuclear and conventional military capabilities. With due consideration for source protection, I would suggest that this Committee to consider mandating that this report describe in far greater detail the development of the PLA's strategic nuclear capabilities. Denial of information only serves to diminish the strength of a public discussion vital to the security of this nation.

The following are responses to issues of concern listed by this Committee as they pertain to the future strategic capabilities of the People's Republic of China:

**Committee Concern One: The status and future direction of programs and activities in the Russian Federation and the People's Republic of China (PRC) to modernize, update, or modify their nuclear weapons arsenals**.

In general it can be assessed that the PLA has reached a technology threshold that will allow it to begin to deploy greater numbers of long range ICBMs and SLBMs if it so choses, and to equip its long range missile with multiple warheads. When this happens, annual growth in PLA nuclear warheads could transition from double digits to triple digits. Regional IRBM/MRBM forces of nuclear and non-nuclear DF-21A/B/C/D reportedly will be joined by a new 4,000km missile family by 2015. The PLA's arsenal of 1,500+ km range land attack cruise missiles could be joined by similarly ranged air launched and sea launched cruise missiles. By later this decade or early in the next decade this larger land and sea based missile force could be protected by a growing ballistic missile defense (BMD) system and enhanced by multiple PLA space warfare systems. It is also necessary to consider the impact on China's strategic nuclear position of both direct and indirect nuclear threats that could emerge from client states aided by China's

proliferation of nuclear and missile technology, as it is necessary to consider the potential for China to enlist Russian "support" in potential nuclear coercion activities against the United States.

This section will first examine PLA missiles by broad categories: intercontinental ballistic missiles (ICBMs), submarine launched ballistic missiles (SLBMs), intermediate range ballistic missiles (IRBMs), medium range ballistic missiles (MRBMs) and ground launched cruise missiles (GLCMs). Principle sources for data and numbers include *Jane's Strategic Weapon Systems,* the Department of Defense China Military Power Reports (CMP Report) and annual *Military Balance* reports of the International Institute of Strategic Studies in London. From 2005 to 2009 the CMP Report provided a breakdown in PLA missiles by individual missile system and provided a range of estimates for missile numbers and launcher numbers. However, in 2011 the CMP Report did not list PLA missiles by individual type, but instead reported numbers in less specific (and less useful) broad categories.

**ICBMs and SLBMs**

| **Estimated Growth in PLA ICBMs and SLBMs:** DoD **vs** ***IISS*** (1) | | | | |
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| | 2006 | 2008 | 2009 | 2010 |
| **ICBMs** | | | | |
| DF-4 (CSS-3) 5,400km range; 1x 1-3MT warhead | 16-24/ ***20*** | 15-20/ ***20*** | 10-15/ ***10*** | NA/ ***10*** |
| DF-5A (CSS-4 Mod 2) 13,000km range. 1x warhead | 20/ ***20*** | 20/ ***20*** | 20/ ***20*** | NA/ ***20*** |
| DF-5B (CSS-4 Mod 3 ?) 13,000km range; 5-10 warheads (2) | | | | |
| DF-31 (CSS-10 Mod 1) 7,200+km to 8,000km range: 1x warhead | NA/ ***6*** | <10/ ***6*** | <10/ ***12*** | NA/***12*** |
| DF-31A (CSS-10 Mod 2) 11,200+ km range; 1x warhead | NA/***NA*** | <10/ ***NA*** | 10-15/ ***24*** | NA/***24*** |
| DF-XX First seen in 2007; undesignated by DoD but suspected of having multiple warheads; estimate 5-10 warheads | | NA/ ***NA*** | NA/ ***NA*** | NA/***NA*** |
| **Total ICBMS** | 36-44/***46*** | <55-60/ ***46*** | <50-70/ ***66*** | 50-75/ ***66*** |
| **SLBMs (3)** | | | | |
| JL-1 (CSS-N-3) 1,770+ km; 1x warhead | 10-14/ ***12*** | NA/ ***12*** | NA/ ***12*** | NA/ ***12*** |
| JL-2 (CSS-NX-5) 7,200+ km to 8,000km range; 1x warhead | NA/ ***NA*** | NA/ ***24*** | NA/ ***24*** | NA/ ***24*** |
| **Total SLBMs** | 10-14/ ***12*** | NA/ ***36*** | NA/ ***36*** | NA/ ***36*** |

Sources: Department of Defense CMP Reports for 2007, 2009, 2010 and 2011; International Institute for Strategic Studies *Military Balance* for the same years. Reporting year represents assessment of previous calendar year.

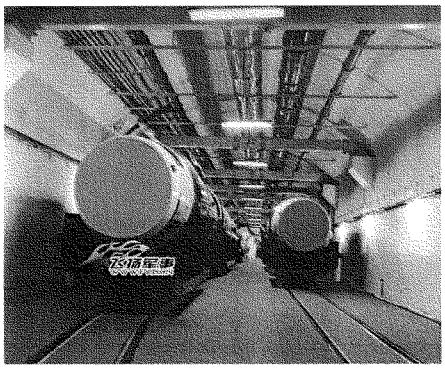
1. DoD numbers in Roman type, ***IISS numbers in bold italics***.
2. Reported MIRV variant, existence not confirmed by CMP Report or IISS reporting.
3. It is not clear that JL-1 and JL-2 have reached deployed status.

The above chart attempts to convey an estimate in the growth in the PLA's ICBM and SLBM force for the most recent 11th Five Year Plan (2006-2010), as offered by annual Department of Defense China Military Power reports and the International Institute for Strategic Studies. It suggests that overall number growth ranges from a possible low of 36 missiles in 2006 to a potential high of 75 by 2010. While these numbers are only illustrative, they should prompt questions regarding the potential rate of growth in PLA ICBMs and SLBMs. This chart also illustrates a transition from liquid-fueled ICBMs, which may remain in service for some time, to

a larger number of newer solid fueled missiles that are mobile and could in the future feature multiple independently targetable reentry vehicle (MIRV) warheads.

**DF-4 (CSS-3)** Developed in the 1960s but not deployed until about 1980, the two-stage liquid fueled, single warhead DF-4 also formed the basis for the Long March-1 family of space launch vehicles (SLVs). At the height of its service about 25 were reported deployed, though numbers are said to have fallen to about 10. The DF-4 is likely stored in cave bases, which raises questions about its true number. Its longevity has likely been aided by the continued production of the Long March-1 SLV and it stands to reason that inasmuch as its range has been increased from early estimates of 4,750km (*Jane's Strategic Weapons*) to 5,300+km (DoD), this missile has also benefited from engine, reliability and guidance improvements developed for the Long March-1. However, the DF-4 represents a vulnerable first generation ICBM that requires open erection and lengthy refueling before launch.

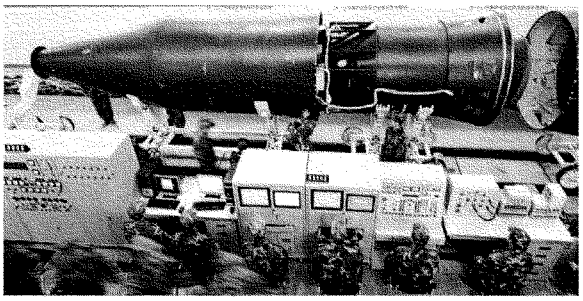
**DF-5A (CSS-4 Mod 2)** Reported to have entered service in 1981, in 2002 DoD reported that the DF-5 would be replaced by the improved DF-5A by "mid-decade" or about 2005. The count of "20" DF-5A ICBMs has been consistently reported by DoD and the IISS, which also notes there are three brigades of this ICBM in the Second Artillery. The improved liquid-fueled DF-5A has a reported range of 13,000km which would allow it to reach all of the continental United States. These missiles are reportedly kept in concealed silos though evidence of cave storage should raise questions about the ultimate number of these ICBMs. Jane's Strategic Weapons has reported on the possibility of some DF-5A ICBMs being armed with 4-6 MIRV warheads while Asian military sources have mentioned to this analyst in 2010 that a MIRV warhead version may be called the "DF-5B." The 2011 CMP Report notes that by 2015 the PLA will have "enhanced CSS-4s." Could this mean with MIRV warheads? Inasmuch as the PLA has shown a penchant for sharing warhead technology between different types of missiles, the development of MIRV warheads for a future ICBM raises the potential for older DF-5 ICBMs to be fitted with MIRVs. While there has been a tendency to expect that the DF-5A will be succeeded by new mobile solid fueled ICBMs, the DF-5A may persist in service for some time as it can benefit from the ongoing production line for and improvements developed for its derivative Long March-2 and Long March-3 SLVs.



This 2006 image of what appear to be DF-5 ICBMs on horizontal carriages in a storage cave should raise questions about the ultimate number of these ICBMs. Source: FYJS Web Page

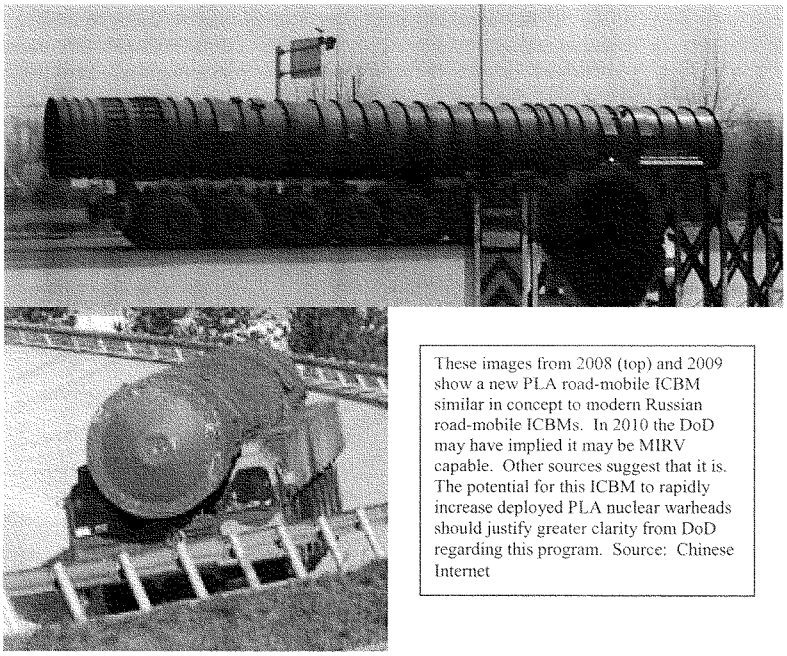
**DF-31 (CSS-10 Mod 1)** While its development reportedly extends back to the 1970s and it may be derived from early efforts to develop the JL-2 SLBM, the sold-fueled and road mobile DF-31 reportedly was not tested successfully until 1995 and was not considered operational until 1999, when it appeared publicly for the first time in the October 1 military parade that marked the 50th Anniversary of the CCP regime. This parade featured three DF-31 ICBMs and by 2010 IISS would report that 12 DF-31s or one brigade had been deployed, whereas up to 2010 DoD would report this number as "<10." Reported to be a three stage solid fuel missile with a single warhead and a 7,200+km to 8,000km range, the DF-31 is carried in a smooth featured cold-launch tube towed by a Hanyang HY 4301 truck. As such, it likely requires a network of paved roads so as to avoid causing fatal cracks in its solid rocket motor. While a considerable technical achievement for the PLA, the likelihood of there being only one DF-31 brigade suggests the PLA was interested in moving quickly to larger ICBMs.

**DF-31A (CSS-10 Mod 2)** Reports of a longer range solid-fueled ICBM at first referred to a new missile called the "DF-41," which according to reports was being assisted by Russia during the 1990s with PLA access to technology from the RS12M *Topol* (SS-25) road mobile solid-fuel ICBM. Again, according to reports this program was not successful, but raises the possibility that China learned enough to advance the development of a larger and longer range version of the DF-31. The 2002 CMP Report mentioned that an "extended range" ICBM would be developed from the DF-31 and by 2008 the CMP Report noted that DF-31A numbers were "<10." However, by 2010 the IISS was reporting that DF-31A numbers had grown to 24, or two brigades. The 2011 CMP Report notes "additional CSS-10 Mod 2s" will appear by 2015. This ICBM has a range reported as 11,200+km by CMP and as up to 10,000km to 14,000km by Jane's Strategic Weapons Systems. The DF-31A is transported in a redesigned cold-launch tube towed by new Hanyang HY 4330 truck, but the concept is the same as with the DF-31. There has been considerable speculation that there may be MIRV warhead versions of the DF-31A, with an Asian military source having suggested to this analyst in 2007 that the DF-31A could carry three to four warheads. However, this has not been verified by U.S. government or other reporting. In 2009 an image of the DF-31A third stage showed it featured generous maneuvering thrusters and that there was enough space for multiple warheads or one warhead and multiple decoys. All of these capabilities would be intended to increase the survivability of the warhead bus.



The February 2009 issue of *PLA Pictoral* included this image of the third stage of the DF-31A ICBM. It shows multiple thrusters on the base of the stage and the shroud suggests there is space for multiple warheads, or for one warhead and multiple decoys.

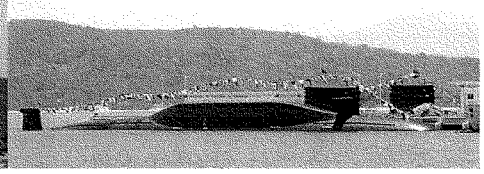
**DF-XX (CSS-XX ?)** In 2007, 2008 and 2009 there was a selective release of images on the Chinese internet of a new larger road-mobile ICBM that has not yet been designated by Chinese or U.S. sources. The distinctive feature of this ICBM is that it uses a 16x16 large-wheeled off-road transporter-erector-launcher (TEL) similar to that used by modern Russian road-mobile ICBMs like the *Topol* (SS-25) and the *Topol-M* (SS-27). Despite the availability of imagery, not until 2010 did the DoD CMP Report offer the comment, "China may also be developing a new road-mobile ICBM, possibly capable of carrying a multiple independently targeted re-entry vehicles (MIRV)." It would appear that the near-term deployment of a much larger off-road mobile and MIRV equipped ICBM would have justified a greater degree of public concern by the Department of Defense, inasmuch as this ICBM has the potential to make annual growth in deployed PLA nuclear warheads increase from double-digits to triple-digits. In mid-2010 an Asian military source suggested to this analyst that this ICBM could carry five to ten warheads. This would hold the potential for one brigade of 12x ICBMs to deploy 60 to 120 warheads. With four or eight brigades of this ICBM the PLA conceivably may be able to deploy enough warheads to threaten the 450 U.S. single-warhead *Minuteman-III* ICBMs deployed in stationary silos in North Dakota and Montana. As such, it would appear justified for this Committee to seek a greater degree of clarity from the Department of Defense on the status of this program and its threat potential.



These images from 2008 (top) and 2009 show a new PLA road-mobile ICBM similar in concept to modern Russian road-mobile ICBMs. In 2010 the DoD may have implied it may be MIRV capable. Other sources suggest that it is. The potential for this ICBM to rapidly increase deployed PLA nuclear warheads should justify greater clarity from DoD regarding this program. Source: Chinese Internet

**JL-1 and JL-2 SLBMs** Following on Mao Zedong's 1958 decision that China should have nuclear powered ballistic missile submarines (SSBN), just as United States and the Soviet Union, what became the 4th Academy of the China Aerospace Corporation led the development of the first solid-fueled long-range ballistic missile for the PLA, the *Julang-1* (Great Wave-1, JL-1) submarine launched ballistic missile. The first Type 092 (Xia class, US Navy designation) SSBN was launched in 1981 and the JL-1 was not successfully fired from an underwater platform until October 1982 and then from the Type 092 in 1988. Only one Type 092 SSBN is the PLA Navy. It carries 12x 1,700km range JL-1s but its operational status is not clear. While the submarine has been well photographed and appears in ceremonial displays it is not clear that it undertakes deterrence patrols, though it could be deployed for combat missions. The 2011 CMP Report states, "The operational status of China's single XIA-class ballistic missile submarines (SSBN)...remains questionable."

However, the future of the PLA's sea-based nuclear force rests with the second-generation Type 094 (JIN class) SSBN and its associated JL-2 (CSS-NX-5) SLBM program. Though the IISS reports that at least two Type 094s have been commissioned, the 2011 CMP Report states, "the associated JL-2 SLBM has faced a number of problems and will likely continue test flights. The date when the JIN-class SSBN/JL-2 SLBM combination will be fully operational is uncertain." Previous CMP Reports have offered an estimate that the PLA will build up to five Type 094s, which could result in an eventual force of 60 JL-2 SLBMs. While no U.S. source has indicated the JL-2 may be equipped with multiple warheads, in 2007 an Asian military source suggested to this analyst that it may carry three to four warheads. Images of the JL-2 in "pop up" tests show blunt nose configuration that would be consistent with multiple warheads. But inasmuch as the PLA Navy is developing a third generation Type 095 nuclear attack submarine, it is possible that a third generation SSBN, sometimes called Type 096, may also be in development. It should be expected that such a potential new SSBN will feature an improved capability SLBM, perhaps a version of the JL-2 or even a new SLBM.

An April 2009 CCTV image (left) shows a pop up test of the JL-2; note the blunt nose cone. Below is an early 2009 image of the Type 094 SSBN at Yalong Bay in Hainan Island for a ceremonial visit by CCP Chairman Hu Jintao. Source: CCTV and Chinese Internet

**Regional Nuclear and Missile Forces**

| **Estimated Growth in PLA MRBMs and LACMs: DoD vs *IISS*** (1) | | | | |
|---|---|---|---|---|
| | 2006 | 2008 | 2009 | 2010 |
| **MRBMs** | | | | |
| DF-3A (CSS-2 Mod ?) | 14-18/ | 15-20/ ***2*** | 5-10/ ***2*** | NA/***2*** |
| DF-16 (CSS-?) 800km-1,000km range; IOC in 2011? | | | | |
| DF-21 (CSS-5) 1,700+km to 2,150km range; 1x nuclear warhead | 40-50 | NA/ ***33*** | NA/***80*** | NA/***80*** |
| DF-21A (CSS-5 Mod 2) 2,500km range; 1x nuclear warhead | | | | |
| DF-21C (CSS-5 Mo) Terminal guided land attack, IOC 2005-2006 ? 2,800km range?; Non-nuclear warhead for now ? | | NA | NA/ ***36*** | NA/***36*** |
| DF-21D (CSS-5 Mod ?) Anti-ship ballistic missile, 2,800km range ?: IOC 2010 or 2011 ? Non-nuclear warhead for now? | | | | NA |
| DF-XX New 4,000km range MRBM expected by 2015; nuclear and non-nuclear armed versions possible | | | | |
| **Total MRBMs** | 40-50 | 60-80/ ***33*** | 85-95/ ***118*** | 75-100/ ***118*** |
| **LACMs** | | | | |
| DH-10 GLCM 1,500+km to 1,800km range; 1x non-nuclear or nuclear warhead | 100 (2) | 150-350 | 200-500 | 200-500+ |
| DH-10 ALCM 1,500+km range to 1,800+km rane; 1x non-nuclear or nuclear warhead, IOC in 2011 ? | | NA | NA | NA |
| **Total LACMs** | 100 (2) | 150-350 | 200-500 | 200-500+ |
| **Total Regional PLA Missiles** | 140-150 | 210-430 | 285-595 | 275-600+ |

Sources: Department of Defense CMP Reports for 2007, 2009, 2010 and 2011; International Institute for Strategic Studies *Military Balance* for same years. Reporting year represents assessment of previous calendar year.

1. DoD numbers in Roman type unless otherwise noted; ***IISS numbers in bold italics.***
2. From early 2007 Taiwan press report.

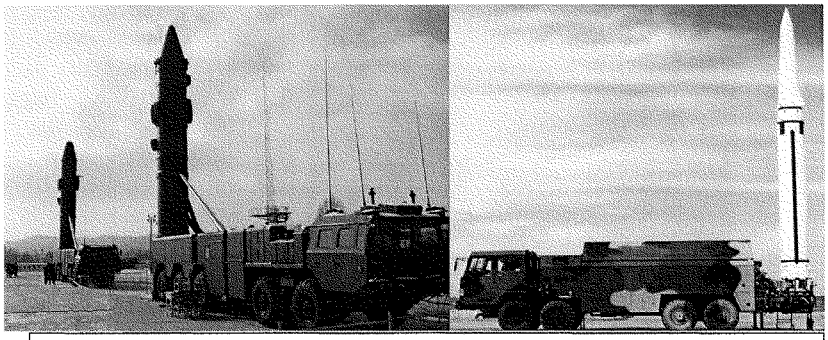
The PLA's Second Artillery Corp missile force maintains medium range ballistic missiles (MRBMs) that are nuclear and non-nuclear warhead armed, plus land attack cruise missiles (LACMs) that are non-nuclear armed, but could carry nuclear warheads. In addition the Second Artillery maintains a growing force of 1,000-1,200 (DoD CMP Report 2011) short-range ballistic missiles (SRBMs). The PLA plans to use its regional and short-range missiles in an integrated manner for strategic strike and tactical support missions, as part of it developing multi-service Integrated Joint Warfare strategies. This could include coordinated use of both nuclear and non-nuclear armed missiles. The above chart shows a substantial PLA investment in its regional missiles forces, with U.S. government estimates provided by the annual CMP Reports showing over the 11th Five Year Plan (2006-2010), the possibility of a near 100 percent increase in MRBMs and a near 5x increase in LACMs. While it is likely that older DF-21 MRBMs may be replaced in the coming years, this family could be succeeded by a new 4,000km range family of missiles, as LACM numbers grow due to their deployment by the PLA Air Force and PLA Navy.

**MRBMs**

According to open sources the PLA Second Artillery Corp is close to phasing out its 2,800km range liquid fueled DF-3A, an improved version of the DF-3 that likely entered service in the late 1980s. This family of MRBMs targeted U.S. military facilities in the Western Pacific and represented a first-generation system that required lengthy open refueling before launch.

Currently the mobile and solid-fueled DF-21 family is the most important MRBM system for the Second Artillery. IISS reports that there are five brigades of a nuclear warhead armed DF-21 variant, with DoD and IISS estimates of total numbers ranging from 50 to 80. This variant was displayed prominently in the 1999 CCP parade and started the PLA practice of using a truck to tow a cold-launch missile tube. It was derived from the JL-1 SLBM. In July 2002 the *Washington Times* report noted the DF-21 was tested with multiple decoy warheads while a February 2003 *Yomiuri Shimbun* report noted that a DF-21 was tested with multiple warheads in December 2002. It has not been reported in open sources that the PLA has subsequently modified some number of its early DF-21 with MIRV warhead.

Then in 2007 internet-source imagery began appearing of a new MRBM similar in size to the DF-21 but using a new 10x10 wheeled off-road capable TEL. This missile was subsequently identified as the "DF-21C," though early images appears to show two potential variants, one with a sharp pointed missile tube cover and one with a rounded missile tube cover. One of these variants features a bi-conic maneuverable warhead similar in shape to the warhead stage used by U.S. MGM-31 *Pershing-II* terminally-guided MRBM—which is also used by the DF-15B SRBM. There is a direct relationship. After the *Pershing IIs* were dismantled as part of the 1988 Intermediate Nuclear Forces Treaty with the former Soviet Union, in the 1990s Chinese agents were able to obtain detailed information about this missile by purchasing trash from U.S. military bases that had discarded *Pershing-II* parts and information. China's version likely incorporates more powerful radar and computers to achieve high accuracy. This MRBM allows to PLA to threaten key components of the U.S. military facilities on Okinawa, as it would also be able to target entrances to caves in Western Taiwan intended to shield its air force from early PLA missile strikes. While this DF-21 version likely uses a non-nuclear warhead it is conceivable that some could be nuclear warhead armed. The rounded tube cover version of this missile suggests another version that may be equipped with multiple nuclear or non-nuclear warheads or one warhead and multiple decoys.



These images from 2007 show what appear to be two versions of the "DF-21C" (left) and the DF-15B SRBM with the terminally-guided warhead believed also used on a version of the DF-21C. Source: Chinese Internet

China has also extended the *Pershing-II* concept into a terminally-guided anti-ship ballistic missile (ASBM), currently known by the designator DF-21D. In February 2011 China's *Global Times* reported the DF-21D had a 2,800km range. Instead of dropping down fast on a target like the DF-21C, it apparently uses maneuvers to both complicate interception and slow down the warhead so that a combination of synthetic aperture radar (SAR) and optical targeting systems in the warhead stage can better home in on a large ship. This MRBM's mission, however, depends on the PLA's ability to find a target by combining satellite, radar, electronic intelligence (ELINT) and airborne sensors. The DF-21D is believed initially to be armed with non-nuclear warheads that could include electro-magnetic pulse or flechettes that would achieve a "mission kill" rather than sink a ship. However, there is the potential for it to be armed with "kinetic" warheads that could do far more damage. Recent statements by U.S. Navy officials appear to indicate that this missile is near to if not already entering service.

There are two other PLA regional missile programs of importance. In March 2011 the Taiwan Legislature was told by a director of their National Intelligence Bureau that the PLA has started deploying a new 800km to 1,000km range missile called the "DF-16." While thought to be designed to achieve higher speeds to evade Taiwan's missile defense systems, an 800km range would allow this missile to attack U.S. military facilities on Okinawa from many points in China's Zhejiang Province.

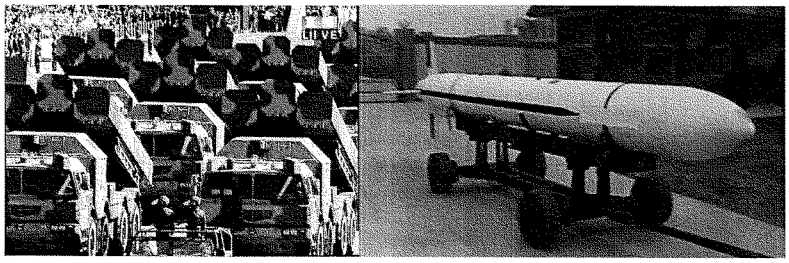
Then, in a rare public Chinese disclosure, on February 18, 2011 the *Global Times* cited a "military source" that the China Aerospace Science and Industry Corporation (CASIC) was developing "a medium- and long-range conventional missile with a traveling distance of as far as 4,000 kilometers." Furthermore, it could be ready by 2015. While such a new intermediate range ballistic missile (IRBM) could eventually be nuclear armed, the *Global Times* appears to indicate that it may succeed the DF-21D as a longer-range ASBM and non-nuclear precision attack missile. This would be in response to the U.S. Navy's plans to deploy long-range unmanned attack aircraft on aircraft carriers by the early 2020s, which in turn was a response to the DF-21D.

**LACMs**

The PLA has been developing advanced land attack cruise missiles (LACMs) since the 1970s, devoting significant resources to develop new materials, micro guidance systems and small efficient engines, while pursuing technology shortcuts by purchasing pieces of the U.S. BGM-109 *Tomahawk* from Iraq and Afghanistan and purchasing Russian/Ukrainian Kh-55 LACM. It appears that most advanced development and testing was completed during the 10th Five Year Plan (2001-2005) as by 2006 the first reports of a Second Artillery LACM brigade emerged from Taiwanese sources, with about 100 reported deployed by 2007. The 2011 DoD CMP Report offers that the PLA had between "200-500" LACMs by 2010. This potential rapid buildup in LACM numbers is due largely to their lesser expense compared to MRBMs or SRBMs.

The Second Artillery's main LACM is called the "DH-10," and has a range of 1,800km according to Jane's Strategic Weapons Systems. It likely uses a combination of terrain following and navigation-satellite based guidance systems and Jane's notes that it could be armed with

either a non-nuclear or a nuclear warhead. Three DH-10 LACMs are carried on a truck-based TEL which apparently can facilitate rapid reloads of DH-10 containers. The PLA Navy uses 500km to 600km range YJ-62 cruise missile, similar in configuration to the DH-10, as an anti-ship missile currently launched from the Type 052C destroyer and from land-based truck TELs. It is expected that an anti-ship or land-attack variant of the DH-10 or YJ-62 could eventually equip PLA nuclear powered and conventional submarines. Later this decade the PLA should be expected to develop advanced variants of both cruise missiles, perhaps with greater range, accuracy and supersonic dash capability.



The DH-10 LACM is now a major strike system for the Second Artillery; seen in the 2009 CCP Parade (left) and a rare image of the DH-10 missile (right). Source: Chinese Internet

**ALCMs and Future Bombers** While not a main concern when examining the PLA's nuclear modernization, it is important to monitor the PLA's potential to introduce advanced bomber systems later this decade. In 2007 internet source imagery appeared of a new variant of the venerable X'ian Aircraft Corporation (XAC) H-6 bomber, a development of the Soviet Tupolev Tu-16 bomber that first flew in 1955. This program apparently was a response to Russia's early 1990s refusal to sell the supersonic Tupolev Tu-22M *Backfire* bomber, a position that was reversed early in the last decade, but the PLA had already committed to its less expensive alternative. The "H-6K" was shown to have new more powerful Russian turbofan engines, a redesigned nose section with a new radar and optical targeting system and a new four-crew flight deck. But most significantly the H-6K was shown to be armed with six new air launched cruise missiles (ALCMs) on wing pylons, with the option that more might be carried in the bomb bays. By mid-2011 new imagery indicated that XAC may have started production of new H-6K bombers. In 2007 an Asian military source told this analyst that the PLA could build up to 50 of these new bombers. With its more powerful and efficient turbofan engines the H-6K likely has a radius close to 3,000km, which combined with an ALCM with a range close to 2,000km, would allow approaches to U.S. bases on Guam from several axis.

It would be important also to clarify if the XAC has been developing a new larger stealthy or supersonic bomber to succeed the long-serving H-6. During activities to mark the 60th anniversary of the PLA Air Force in 2009 a new China Aviation Museum display featured a model of a large delta-wing subsonic bomber, which if realized might have intercontinental

range. In addition, since the 1980s the PLA has funded extensive research into advanced supersonic and hypersonic speed technologies. In early 2010 researchers from the prestigious Institute of Mechanics, a major center for hypersonic research, published a paper outlining a concept for a Mach-3 speed waverider platform. This could represent a program to develop a new manned attack aircraft.

An apparent new-production H-6K bomber seen outside the X'ian Aircraft Co. factory in May 2011 (top). Source: Chinese Internet

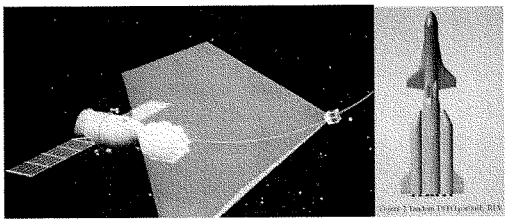
Advanced bomber concepts could include new subsonic or supersonic platforms. In early 2010 researchers from the Institute of Mechanics published a paper reviewing their concept for a Mach-3 waverider concept (bottom), seen in one of the Institute's wind tunnels. Source: Journal of Astronautics

**Ballistic Missile Defenses (BMD) and Space Warfare**

Since the 1980s China has pursued a vigorous diplomatic and propaganda campaign against space warfare and missile defense, especially U.S. missile defense programs. But historically for the PLA, ballistic missile defense and space warfare are related pursuits. Mao Zedong ordered the creation of China's first BMD program in 1963, which became known as the 640 Program, which eventually had a subsidiary anti-satellite (ASAT) program. Mao was apparently aware of early BMD programs in the Soviet Union and the United States and also wanted a "shield" for his ballistic missile "swords." While Deng Xiaoping ordered a halt to the 640 Program in 1980, it had produced one prototype interceptor missile and a large space tracking radar. Most 640 Program development work took place near the city of Korla, capital of the Mongol Autonomous Prefecture of Xinjiang Province, and today Korla remains a key center for current PLA BMD research and development.

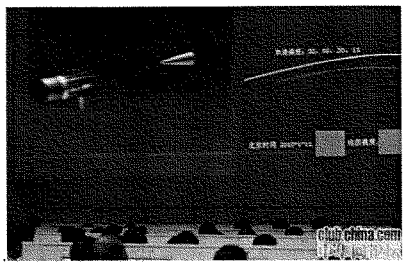
The PLA's most recent BMD and space warfare programs likely date to late 1980s following the 1986 establishment under Deng of the "863 Program" for funding intensive basic scientific research and technology development to aid economic and military modernization. Initial efforts to pursue space plane programs were justified by their potential military utility. And even

though space planes were delayed in favor of what became the Shenzhou space capsule, practically every Shenzhou mission has been used for a military purposes. This includes Shenzhou-7's September 27, 2008 pass to about 45km (according to U.S. Strategic Command) from the International Space Station, having just launched a micro-satellite, finely illustrating the "dual use" nature of China's manned space program: was it an advance for China's space technology or a practice "co-orbital" interception for the PLA? Inasmuch as the PLA controls China's space program it can be expected that the 60-ton space station expected by 2020, or a 100+ ton space plane expected about the same time, will be "dual use" as well, able to target U.S. assets in Low Earth Orbit critical to its military activities. In late 2010 the PLA may have tested a small space plane called *Shenlong,* similar in size to the U.S. X-37B.



Shenzhou-7's Sept. 27, 2008 close pass by the ISS illustrates the "dual use" nature of China's space program. China may launch a reusable space plane by 2020 (right), a program also grounded in military requirements. The U.S. should expect that China's dual use program will target U.S. space assets that contribute to America's strategic nuclear warfighting capability.

But today PLA counter-space and BMD programs remain related in missile programs producing ASAT and BMD systems. In contrast to the 640 Program, it was the January 11, 2007 interception of a weather satellite that preceded the January 11, 2007 interception of a missile warhead launched toward Korla, which now hosts a new missile interception radar. After its 2007 success the PLA ASAT system was designated "SC-19" by U.S. officials. The SC-19 was likely derived from the KT-1 SLV program, which put two liquid fuel stages on the two solid-fuel stages of the DF-21 MRBM. It is possible that a version of the SC-19 may have also been used for the 2010 warhead interception. However, there are reports that the PLA is developing a family of dedicated BMD missiles, building on its success in developing 4th generation surface-to-air missiles (SAMs). In early 2008 an Asian military source indicated to this analyst that the PLA could deploy a national BMD system by 2025. While there has been no official U.S. or other assessments that acknowledge this possibility, due to its potential to affect the strategic nuclear balance between the U.S. and China, such a development should be of great interest to this Committee.




This image from a missile control room, apparently showing a computer generated depiction of a warhead interception, appeared shortly after the January 11, 2010 warhead interception. Use of such computer generated simulations is a common feature of Chinese space launch control rooms. Source: Chinese Internet

**Major Questions about the PLA's nuclear and strategic weapons development:**

1. **When will the PLA begin deploying MIRV equipped ICBMs; how many warheads by when?**
2. **Will there be a third generation SSBN to follow the Jin-class and will it have a new SLBM?**
3. **Will the PLA deploy a new 4,000km range missile family as reported in the Chinese press?**
4. **What is the status of the PLA's next generation bomber program—will it go supersonic?**
5. **How quickly will the PLA develop space warfare capabilities that threaten U.S. strategic space systems?**
6. **What is the projection for the PLA's deployment of a national BMD system?**

**Committee Concern Two: The evolution, current state, and future direction of nuclear weapons policy and strategy in Russia and the PRC.**

*"The atom bomb is a paper tiger which the U.S. reactionaries use to scare people. It looks terrible, but in fact it isn't. Of course, the atom bomb is a weapon of mass slaughter, but the outcome of a war is decided by the people, not by one or two new types of weapon" Mao Zedong, Little Red Book, 1946*

China's approach to nuclear weapons, from the earliest kernels of Mao Zedong's thoughts about them, have combined the intense desire to possess nuclear capabilities, the desire to achieve this capability indigenously with the near equal desire to conceal or deceive in regards to ultimate purpose. This later point is illustrated by the Mao's famous 1946 bluff—three years before taking power--that U.S. nuclear bomb was a "paper tiger," that China's masses were far more powerful. But as the biography of Mao by Jung Chang and Jon Halliday (*Mao, The Unknown Story,* Alfred A. Knopf, 2005) makes clear, Mao wanted nuclear weapons as soon as he heard of their use against Hiroshima and devoted enormous energy toward their acquisition, first imploring Stalin for them, and eventually convincing Khrushchev to begin the technical assistance that greatly reduced Mao's acquisition of nuclear weapons and missiles, even though Khrushchev woke up to Mao's larger power ambitions and ended this assistance in 1960. For Mao, achieving this ultimate power was among the highest requirements for preserving and defending the CCP revolution from foreign threats and then for advancing his ambitions for Communist world and then world leadership.

Perhaps the main insight to draw from these observations is that Chinese statements or descriptions that pass for policy or strategy must be treated with appropriate skepticism, especially in regards to China's currently unfolding ambitions, first in Greater Asia and then globally. In short the PRC government would like the world to view China's nuclear policies and goals as essentially "limited" to the needs of assuring "adequate retaliation" in the event of attack, with the assurance it will not seek "nuclear superiority." Nuclear weapons, in this view, also are not intended for "offensive" military action. This "limited" posture then serves to justify PRC calls that the U.S. and Russia "drastically reduce" their nuclear arsenals before Beijing considers nuclear limitation agreements, and also justifies Beijing's principled opposition to "destabilizing" missile defense and space warfare schemes, especially by the United States.

For most of the PRC's 62 year history such a strategy was made necessary by harsh economic realities, many created by Mao's paranoia and megalomania, which made building a large nuclear arsenal impossible even considering the great economic burden of pursuing a limited indigenous nuclear weapon, nuclear missile and nuclear missile submarine capability. During the leadership of Deng Xiaoping, Jiang Zemin and now Hu Jintao, conveying the notion of a

"limited" nuclear strategy advances the goal of allaying suspicions in the West and in developed Asian countries in order to facilitate access to markets and technology. But even though the 1989 Tiananmen Massacre exposed anew the nature of the CCP regime, and even led to arms embargoes by the United States and Europe, the PRC pursued a gradual nuclear force modernization as it became far more adept at wielding its economic-political power to advance its commercial and political goals.

But will a "limited" nuclear posture remain sufficient for the PRC? The Tiananmen uprising warned the CCP above all others of its thin legitimacy and of the need to defeat internal threats and then external threats, starting with what it views as an existential threat from the "Chinese" democracy on Taiwan and preventing the fall of a pro-PRC dictatorship in North Korea. For the CCP these challenges are directly connected to the larger problem of American strategic power in East Asia and the further problem of Western dominance of rules, norms and markets that increasingly affect CCP power at home. After twenty years of intense military investment since 1989, the CCP has put the PLA on a trajectory toward building the world's second most powerful power projection navy, amphibious navy, air force and airmobile army force after the United States—assuming it can continue to afford superior forces. If the CCP leadership values this level of "conventional" military power, then does it stands to reason that it would value a much greater level of nuclear missile and associated military space power?

**Assured retaliation** Regarding specifics of PRC nuclear policy, the 2011 CMP Report states:

> "Beijing's official policy towards the role of nuclear weapons continues to focus on maintaining a nuclear force structure able to survive an attack, and respond with sufficient strength to inflict unacceptable damage on the enemy. The new generation of mobile missiles, maneuvering and MIRV warheads, and penetration aids are intended to ensure the viability of China's strategic deterrent…"

In addition to the listed weapon enhancements like MIRV warheads the PLA has constructed a massive network of underground missiles shelters, perhaps extending to 5,000km. The 2001 CMP Report notes that despite the China penchant for nuclear "secrecy and ambiguity," releasing some information about these facilities serves the "credibility of its limited nuclear arsenal." The CMP Report does not pose an obvious question: has this vast tunnel network allowed the PLA to conceal a much greater number of ICBMs, especially DF-4s, DF-5s and DF-21s, than the numbers listed in CMP Reports in the last five years?

Furthermore, it is worth monitoring whether this notion of a retaliatory and "limited nuclear arsenal" could change significantly depending on the number of new MIRV equipped missile the PLA deploys in the coming decade. Should the U.S. view a potential PLA force of 500 to 1,000 warheads concealed in possible 5,000km long tunnel network as a "limited" capability? What if in the next decade this force comes to be protected by a national BMD network and an array of space weapons that can threaten the range of surveillance, deep space surveillance, communication, navigation and weather satellites essential for the U.S. strategic nuclear capability? Would this also be viewed as consistent with a "limited" nuclear capability?

**"No First Use" (NFU) Pledge** Since 1964 it has been PRC stated policy, "not be the first to use nuclear weapons at any time or under any circumstances." The 2011 CMP Report notes the NFU pledge has two components: the PRC will "never use nuclear weapons first against any nuclear weapon state," and "will never threaten to use nuclear weapons against a non-nuclear state or nuclear free zone." Despite some well know "ambiguities," the CMP Report concludes there is "no indication that national leaders" have amended the NFU.

Some analysts have noted that the NFU pledge was closer fit to Chinese nuclear strategies during the early period when China truly had a limited nuclear force. But today the Second Artillery, and perhaps soon, the PLA Air Force and PLA Navy will have an array of nuclear weapon systems, and a larger array of long-range precision-attack non-nuclear weapons that could achieve strategic effects without requiring a nuclear warhead. The PLA soon will not require nuclear weapons to sufficiently diminish the utility of Kadena Airbase on Okinawa or a U.S. aircraft carrier, to provide sufficient time to undertake a range of attack or coercive operations against Taiwan. Will these new weapons increase the PRC's temptation to use decisive force, which following a conventional retaliation, could then justify an escalation to some level of coercive or actual nuclear weapon use?

One of the "ambiguities" in the NFU noted by the 2011 CMP Report is whether the PLA would use nuclear weapons against what it "considers its own territory," most likely referring to Taiwan. A recent example of this ambiguity was in the May 3, 2011 issue of Hong Kong's pro-PRC paper *Wen Wei Po* which had a long article lauding the Second Artillery, with one passage noting:

> "With the focus on defending national sovereignty and territorial integrity, the SAC [Second Artillery Corp] has promoted coordinated development of nuclear and conventional missile troops since the Cold War. It has done this according to the strategic requirement for combing nuclear and conventional weapons as an efficient deterrence. The SAC has constantly enhanced its capability for dual deterrence and dual attack. The corps has made significant contributions in critical periods towards safeguarding national security, combating separatism, and promoting reunification of the country."

"Combatting separatism, and promoting reunification" is a longstanding reference to Taiwan, which raises the prospect that the phrase "dual deterrence and dual attack" could refer to operational guidance that would anticipate SAC usage of both nuclear armed and non-nuclear armed missiles in the event of a Taiwan conflict. At a minimum this might imply that the PLA has integrated the use of nuclear weapons into a Taiwan war plan to a degree that may not be expected in Taipei or Washington.

**Major Questions about PRC Nuclear Policy**

1. **What is the role of deception in PRC nuclear policy and strategy?**
2. **Are circumstances already gathering when the PRC will change its "limited" nuclear stance?**
3. **Should the U.S. assume that the PRC will use nuclear weapons early in a Taiwan campaign?**

**Committee Concern Three: The similarities and differences between U.S. deterrence of Russia and U.S. deterrence of the PRC, as well as extended deterrence in Europe as compared to Asia.**

Today the United States faces very different challenges in deterring Russia versus deterring the PRC. Nuclear competition with the former Soviet Union came to be tempered by an arms control process, albeit a competitive process in the context of larger political struggles, which nevertheless evolved into a firmer basis for confidence and security, especially following the end of global military competition that was a result of the collapse of the Soviet Communist Party dictatorship. Russia has struggled over the last two decades to maintain a "superpower" level of nuclear and conventional military power and recent nuclear arms reduction agreement between the U.S. and Russia have been driven to a large degree by Russian financial constraints as much as any altruistic desire to reduce nuclear arsenals. Russian opposition to U.S. missile defense plans to help defend Europe against future threats from Iran is at times irrational, but this has not stopped Russia from investing in its own more advanced missile defense systems. Russia also appears willing to invest in new space warfare capabilities to match PRC and US capabilities.

As for extended deterrence against Russia, as did the former Soviet Union, Russia today still has to contend with the independent nuclear deterrents of Britain and France. An historic relaxation in threat dynamics have allowed the United States to steadily drawn down its conventional military presence in Europe and it no longer stations tactical nuclear weapons on U.S.Navy warships. European states also have in some cases drastically reduced their conventional military forces, which Russia has not exploited as it might have during the Cold War. While Russia can at times be threatening, especially to the weaker Baltic states and some former members of the Warsaw Pact, its international behavior is more opportunistic and ideology has largely been replaced by a still problematic tendency toward criminality.

One potential deterrence challenge that bears monitoring is the potential for Russia and China to add deeper operational layers to what is currently a largely a declining commercial military relationship enhanced with what at times are competitive regional "alliances." The most prominent of these is the Shanghai Cooperation Organization, which now sees bi-annual multi-service military exercises which have been especially useful for the PLA to develop power projection strategies and concepts. These exercises, a still vigorous commercial relationship in military technology, and likely significant intelligence service and criminal network relationships, do not yet constitute a full blown alliance. Russian popular anxieties about the PRC's growing power in Siberia, Asia and elsewhere are not reflected by Russian elites that profit from the PRC. It bears watching whether Russia and China could enhance non-kinetic military cooperation in the event of a Taiwan conflict. It is even prudent to consider that on a nuclear level that Russia could join the PRC to "tilt" against the United States during a Taiwan conflict, much as the U.S. and China tilted to deter Soviet nuclear threats against China in 1969.

Deterring the PRC, however, remains at a politically more primitive stage and holds the prospect for becoming far more difficult in this decade and beyond. As a state hostile to democracy, especially to the one on Taiwan, the PRC has ambitions to displace the United States as the strategically dominant state in Asia. The PRC is also building toward a superpower level of military strength to rival the U.S. globally. PRC hostility toward the U.S. has been less

concealed in recent years, even though deep economic interdependence pervades this relationship. In addition, for over a decade the PRC has waged the most serious and costly espionage and cyber warfare campaign against the United States.

The PRC has refused to allow the development of useful military confidence with Washington, which the U.S. did build with Russia to a useful degree after the Cold War. Military-to-military dialogue is regularly held hostage to U.S. arms sales to Taiwan, and it has not produced any real Chinese advocates for better relations with the U.S., much as there are plenty of U.S. officials who work for better ties with the PLA. Furthermore, the PRC's refusal to consider nuclear transparency or "strategic assurance" dialogues suggests it desires a far more powerful military and strategic position before doing so. According to press reports, in June 2008 Chinese officials refused to enter into discussions to answer U.S. questions about the size of the PLA nuclear arsenal, and in January 2011 the PRC Defense Minister Liang Guanglie refused the request of U.S. Secretary of Defense Robert Gates to begin a dialogue on nuclear weapons. This followed the April 2010 Nuclear Posture Review in which the Obama Administration made a special case for pursuing "strategic assurance dialogues" with the PRC.

Nuclear deterrence of the PRC is also made problematic by its history of engaging in "optional wars." Even during periods of significant military inferiority, the PRC has repeatedly demonstrated a willingness to use military force, usually during a period when it was relatively assured of victory, or at least a small chance of a concerted retaliation. The PRC was also ready to use force when it perceived the opportunity to change a regional political balance in its favor. Mao joined Stalin's war to support Kim Il Sung in North Korea not just to show solidarity and to teach Washington a lesson, but also because of the promise of a generous Soviet rearmament of the PRC. Deng Xiaoping attacked Vietnam in 1979s because it was strategically overextended in Cambodia, would not receive Soviet military support, and most importantly, expected that the U.S. and Europe would reward him with commerce, technology and weapons. It is worth considering that the PRC may have decided this past Spring that it could get away with rearming Libya's Gaddaffi after learning Washington was not going to lead the European military coalition forming to take action against him. Such intervention in support of dictators could become more frequent and effective after the PLA acquires an amphibious projection fleet and a fleet of C-17 size jet transports.

The PRC's penchant for strategic opportunism may carry into its next generation of leadership. In 1979 the now imminent PRC leader Xi Jinping was an "intern" working for his relative, the Chief of Staff of the PLA Central Military Commission. Xi likely received a unique tutorial in Chinese stratagems and strategic timing, and then went on to develop a deep understanding of Taiwan, serving in many positions in Fujian Province in the 1980s. Later this decade, Xi Jinping will have an increasing level of military superiority on the Taiwan Strait that could be greatly enhanced by effective use of deception and surprise. Will the PLA have enough strategic and regional nuclear forces alone to "deter" a U.S. military response to PLA coercive military operations against Taiwan? Or might a Russian nuclear "tilt" with the PRC against the U.S. serve to seal Taiwan's fate, and usher a reordering of power relations in Asia?

Xi may also decide to strike Taiwan if the leadership of the United States is diverted by a significant disaster, perhaps consisting of multiple nuclear terrorist strikes. The deterrent

problem for the United States is that despite nearly 30 years of "discussions," Washington has failed to prevent Beijing from playing a major role in abetting the nuclear weapons ambitions of Pakistan, Iran and North Korea, all of which have relationships with terrorist organizations capable of undertaking attacks against the United States. In recent years it has been feared that Taliban forces could capture some of Pakistan's PRC-assisted nuclear weapons, but with U.S.-Pakistan relations in a deep decline, what are the chances that a radicalized Pakistani official or government might give the Taliban such weapons? In the future, Iran's PRC-assisted nuclear weapons could be given to Hezbollah, which today is working with Venezuelan and other anti-U.S. forces and networks in Latin America. Should there be strikes against the United States or its allies and interests by PRC-abetted nuclear weapons, what would be the appropriate U.S. response toward the PRC? Furthermore, if the U.S. were to lead a multinational operation to capture Pakistani nuclear weapons, would the PRC attack this force, or even replace any captured nuclear weapons?

Given the PRC's potential to engage in hostile acts, against Taiwan, or against U.S. allies like Japan or the Philippines, putatively to impose maritime territorial claims, plus the danger of a nuclear armed North Korea, the task of extending nuclear and conventional deterrence to Asian allies and friends may become more difficult during this decade, not less. The expansion of PLA regional nuclear and non-nuclear armed ballistic and cruise missiles may soon make a purely "defensive" response insufficient, such as deeper investments in expensive regional BMD systems. It may become necessary for the U.S. to consider a reintroduction of tactical nuclear systems on U.S. ships or a new secure tactical nuclear system for U.S. submarines or a redeployment of tactical nuclear weapons to forward bases, to give the U.S. more flexibility in deterring Pyongyang. As the PLA's all around power increases, deterring North Korea may become a higher priority as an outbreak of conflict on the Korean Peninsula may tempt the PRC to move against Taiwan.

In addition Washington must consider how it can better remain ahead of the PLA in what is now a blossoming arms race in Asia. One offensive-defensive cycle already mentioned is how a new 4,000km PLA IRBM may trump the U.S. Navy's long-range unmanned strike aircraft that were intended as a response to PLA ASBMs. It may be time to abandon the limits of the INF Treaty and begin to develop multi-purpose MRBMs that can perform anti-ship, land-attack and anti-air missions. In addition the U.S. may have to be far more flexible developing deterrent strategy for space, developing several active weapons to be held in reserve as it pursues better "assured access" to space and "resilience" in space systems.

**Major Questions about Deterrence of the PRC:**

1. **Given the PRC's internal insecurities should the U.S. anticipate a decade of increasing PRC hostility?**
2. **Has the PRC decided to forego confidence and transparency with the U.S. in the current period?**
3. **Will increasing nuclear and conventional military strength tempt future PRC leaders to attack Taiwan?**
4. **How should the U.S. pursue justice with the PRC regarding its possible abetting of a nuclear weapon that is used in a terrorist attack against the United States?**

**Committee Concern Four: The impacts of the above on the U.S., including the effectiveness and credibility of the U.S. deterrent and extended deterrent; programs to**

**modernize the U.S. nuclear stockpile, delivery vehicles, and supporting infrastructure; and U.S. nuclear strategy, policy, posture and strategic relationships.**

While this analyst is not qualified to respond to all of these concerns the following suggestions are offered to this Committee:

1. At this stage in United States-PRC relations and given the power ambitions of the PRC leadership, the prospect of any major budget driven U.S. unilateral disarmament could prove destabilizing to U.S. security and U.S. security interests in Asia. Given the PRC's troubling instability and a resulting need for political/military scapegoats, future "weakness" shown by Washington could result in near-term increases in threats to Taiwan or other U.S. allies and friends in Asia. Furthermore, at this time, "negotiated stability" or "parity" in nuclear weapons with the PRC may come at the cost of the U.S. strategic position in Asia.

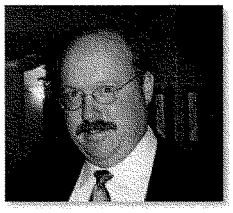
2. Given the potential for the PLA to develop a significantly larger strategic and regional nuclear and non-nuclear missile arsenal, which in the next decade could be defended by a BMD system and supported by a robust space warfare capability, it is suggested that this is not a period to be considering any new reductions in the number of U.S. deployed warheads or in the inventory of stockpiled warheads and warhead components. A modern, survivable nuclear deterrent force of sufficient size may become a more important component of America's ability to deter PRC aggression. This may require reconsideration of recent reductions in nuclear warhead numbers, the reduction of *Minuteman-III* warheads from three to one, and the removal of a secure tactical nuclear capability from the U.S. Navy.

3. While it remains necessary for the U.S. to expand missile defense development, and to expand missile defense cooperation with key allies, it may now be necessary to consider the development of a new family of U.S. MRBMs to deter the PLA's expanding capabilities in this area. The assurance that U.S. and allied ships could sink the PLA Navy with their own ASBMs may be the optimal way to deter the PLA from using its ASBMs. Nuclear deterrence in Asia can be greatly enhanced by keeping abreast of conventional deterrent requirements. For example, the 2009 U.S. decision to end F-22 5$^{th}$ generation fighter production and to refuse to sell this fighter to Japan is proving to have been a great error given the PLA's development of one or more 5$^{th}$ generation fighters with capabilities near to or in excess of the F-22. This decision, and the more recent decision not to sell Taiwan new F-16 fighters, serves to increase PRC temptations to use force, which easily could escalate into U.S.-PRC nuclear confrontations.

4. It is decades overdue that the U.S. pursue a multinational strategy to explain the PRC's past nuclear and missile proliferation and devise a concerted approach to assign "costs" for the potential use of PRC-abetted weapons by terrorists. The PRC likely understands that the U.S. cannot build enough weapons to deter this kind of attack. But the PRC must see that the U.S. can impose a significant price if the PRC does not seek to reverse its past nuclear and missile proliferation.


# Richard Fisher, Jr.

***Senior Fellow, Asian Military Affairs***



Rick Fisher is a Senior Fellow on Asian Military Affairs. Fisher is a recognized authority on the PRC military and the Asian military balance and their implications for Asia and the United States. His most recent book is China's Military Modernization: Building for Regional and Global Reach (Praeger Security International). Fisher has worked on Asian security matters for over 20 years in a range of critical positions -- as Asian Studies Director at the Heritage Foundation, Senior Analyst for Chairman Chris Cox's Policy Committee in support of the report of the *Select Committee for US National Security and Military/Commercial Concerns with the People's Republic of China*, and a consultant on PLA issues for the Congressionally chartered *US China Security & Economic Review Commission*. The author of nearly 200 studies on challenges to American security, economic and foreign policy in Asia, Fisher is a frequent commentator on Asian issues for radio and television and has testified before the Senate Foreign Relations Committee, the House International Relations Committee, the House Armed Services Committee, and the U.S. China Security Commission, on the modernization of China's military. Fisher has been Editor of the Jamestown Foundation's *China Brief*, and a regular contributor to publications such as the *Wall Street Journal*, *Far Eastern Economic Review*, *Jane's Intelligence Review*, *National Interest*, *Air Forces Monthly*, and *World Airpower Journal*. He has served as an election observer in Cambodia, the Philippines, South Korea and Taiwan, and performed field research in China, Taiwan, Russia, India and Pakistan. Fisher studied at Georgetown University and at Eisenhower College where he received his BA with honors. He is currently President of Pacific Strategies, Inc.

**DISCLOSURE FORM FOR WITNESSES**
**CONCERNING FEDERAL CONTRACT AND GRANT INFORMATION**

**INSTRUCTION TO WITNESSES:** Rule 11, clause 2(g)(5), of the Rules of the U.S. House of Representatives for the 112th Congress requires nongovernmental witnesses appearing before House committees to include in their written statements a curriculum vitae and a disclosure of the amount and source of any federal contracts or grants (including subcontracts and subgrants) received during the current and two previous fiscal years either by the witness or by an entity represented by the witness. This form is intended to assist witnesses appearing before the House Armed Services Committee in complying with the House rule. Please note that a copy of these statements, with appropriate redactions to protect the witness's personal privacy (including home address and phone number) will be made publicly available in electronic form not later than one day after the witness's appearance before the committee.

**Witness name:** Richard D. Fisher, Jr

**Capacity in which appearing:** (check one)

_X__Individual

___Representative

**If appearing in a representative capacity, name of the company, association or other entity being represented:**

**FISCAL YEAR 2011**

| federal grant(s) / contracts | federal agency | dollar value | subject(s) of contract or grant |
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**FISCAL YEAR 2010**

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**FISCAL YEAR 2009**

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**Federal Contract Information:** If you or the entity you represent before the Committee on Armed Services has contracts (including subcontracts) with the federal government, please provide the following information:

Number of contracts (including subcontracts) with the federal government:

Current fiscal year (2011):_____;
Fiscal year 2010:_____;
Fiscal year 2009:_____.

Federal agencies with which federal contracts are held:

Current fiscal year (2011):_____;
Fiscal year 2010:_____;
Fiscal year 2009:_____.

List of subjects of federal contract(s) (for example, ship construction, aircraft parts manufacturing, software design, force structure consultant, architecture & engineering services, etc.):

Current fiscal year (2011):_____;
Fiscal year 2010:_____;
Fiscal year 2009:_____.

Aggregate dollar value of federal contracts held:

Current fiscal year (2011):_____;
Fiscal year 2010:_____;
Fiscal year 2009:_____.

**Federal Grant Information:** If you or the entity you represent before the Committee on Armed Services has grants (including subgrants) with the federal government, please provide the following information:

Number of grants (including subgrants) with the federal government:

Current fiscal year (2011):_____;
Fiscal year 2010:_____;
Fiscal year 2009:_____.

Federal agencies with which federal grants are held:

Current fiscal year (2011):_____;
Fiscal year 2010:_____;
Fiscal year 2009:_____.

List of subjects of federal grants(s) (for example, materials research, sociological study, software design, etc.):

Current fiscal year (2011):_____;
Fiscal year 2010:_____;
Fiscal year 2009:_____.

Aggregate dollar value of federal grants held:

Current fiscal year (2011):_____;
Fiscal year 2010:_____;
Fiscal year 2009:_____.


Center for Nonproliferation Studies
Monterey Institute of International Studies
*An affiliate of Middlebury College*

# Maintaining Stable Deterrence with Russia and China

**Testimony**
**of**
**Jeffrey Lewis, Ph.D.**
**Director, East Asia Nonproliferation Program**
**Center for Nonproliferation Studies**
**Monterey Institute of International Studies**

**Before**
**the**
**Subcommittee on Strategic Forces**
**Committee on Armed Services**
**U.S. House of Representatives**
**October 14, 2011**

# Testimony of Jeffrey Lewis, Ph.D.
## Director, East Asia Nonproliferation Program
## Monterey Institute Center for Nonproliferation Studies[1]

It is an honor to testify before the House Armed Services Committee Subcommittee on Strategic Forces.

No country has used a nuclear weapon in anger since the end of the Second World War. The United States has a strong and continuing interest in maintaining the norm against nuclear use. The United States is undoubtedly safer with the end of the Cold War. Today, the principal danger arising from the nuclear weapons possessed by Russia and China is not a deliberate surprise attack or a "bolt from the blue." The most plausible route to nuclear use is now an accident, unauthorized use or miscalculation in a crisis. It is in the United States' interest to drive these risks as low as possible while maintaining its nuclear deterrent.

It is sometimes said that the United States is the only country that is not modernizing its nuclear arsenal. This is not true. In some cases, vague phrases like "nuclear modernization" conflate the modernization of bombers, missiles and submarines with the design of new nuclear warheads or bombs. All the states with nuclear weapons – including the United States – are replacing or modernizing nuclear delivery vehicles to some extent.[2] The United States triad of strategic forces – ballistic missile submarines, intercontinental ballistic missiles and heavy bombers – remains the most-professional, most-capable and best-funded strategic force.

There are no countries producing "new" nuclear warheads today – although the United States, Russia and China continue to manufacture nuclear warheads designed and tested before each signed the Comprehensive Nuclear Test Ban Treaty (CTBT) in 1996.[3]

- Russia regularly remanufactures its existing warheads as a stockpile maintenance precaution.

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[1] The views expressed in this testimony are those of the witness and not necessarily those of the James Martin Center for Nonproliferation Studies or the Monterey Institute of International Studies or any of their sponsors.

[2] The United States is undertaking extensive life extension programs for the D-5 SLBM and the Minuteman III ICBM and has completed a life extension program for the Air Launched Cruise Missile.

[3] Similarly, the United States in 2007 delivered the first newly manufactured pit, for the W88, since the closure of the Rocky Flats pit production facility in 1989. The United States currently manufactures about 10 W88 pits per year. The United States also regularly "refurbishes" existing warheads by replacing components with new ones, either because the new components perform better or because the old technologies are no longer available.

- China tested new nuclear weapons designs before signing the Comprehensive Test Ban Treaty in 1996. China intended these warheads for missiles that are only now being deployed, and is producing those warheads now.

Like the United States, both Russia and China are conducting "subcritical" experiments at their former nuclear test sites, to support ongoing stockpile stewardship. Preparations for subcritical tests, which are not prohibited under the CTBT, are difficult to distinguish from very low-yield "hydronuclear tests" which are prohibited.[4] Russia and China could not, however, develop new nuclear weapon designs with yields of greater than a kiloton without conducting tests large enough to be easily detected by both the Comprehensive Test Ban Treaty Organization's International Monitoring System (IMDS) and the U.S. Atomic Energy Detection System (USAEDS).[5] (A chart showing the purposes of testing at various yields follows the testimony.)

Overall, the United States is the best equipped of the three states for maintaining its stockpile of nuclear weapons under either the current moratoria on explosive nuclear testing or the Comprehensive Nuclear Test Ban Treaty. There is no one in the United States today who would seriously propose "swapping" the US nuclear stockpile and the triad of delivery vehicles for those of either Russia or China. There are no foreseeable scenarios under which either country could initiate the use of nuclear weapons against the United States, our forces abroad or our allies without suffering overwhelming destruction that would outweigh any possible gain. Deterrence against deliberate nuclear attack from Russia and China today is extremely strong.

There are, however remote, plausible scenarios that may result in the use of one or more Russian or Chinese nuclear weapons – non-deliberate scenarios in which Russian or Chinese leaders lose control of their forces or act on the basis of incorrect information. The most pressing task for the United States is to ensure that our nuclear forces, policies and postures provide for stable deterrence during a serious crisis with either country.

Russian leaders, dating to the Soviet-era, have been deeply concerned about their ability to command their nuclear forces during a crisis and have long feared a "decapitating" first strike by the United States. These fears, however unreasonable, have outlasted the Cold War. The most well-known case involved a false alarm in 1995, when Russian officials momentarily mistook the launch of a sounding rocket from Norway for an American attack. Whether such fears are reasonable or not, they explain a series of otherwise puzzling Russian behaviors. The Soviet

[4] Hydronuclear tests produce small nuclear yields. Such tests would be prohibited under the CTBT, but are unlikely to be detected by the International Monitoring System (IMS), which comprises 321 seismological, hydroacoustic, radionuclide, and infrasound monitoring stations around the world.

[5] Recent experience with the IMS suggests the threshold could be considerably lower than 1 kiloton, See Raymond Jeanloz, "Comprehensive Nuclear Test Ban Treaty and U.S. Security," in *Reykjavik Revisited: Steps toward a World Free of Nuclear Weapons* (Stanford University Press, October 2007).

Union constructed a system, Perimeter (sometimes called "Dead Hand" or described inaccurately as a "Doomsday Machine"), to ensure that Soviet nuclear forces could still retaliate in the event that the leadership had been killed. The Russian Federation expressed concern about the possibility that US missile defense interceptors in Poland might be fitted with nuclear weapons and used in the same way that a Pershing 2 might have been during the Cold War. Russian officials insisted that the New START Treaty prohibit parties from placing offensive missiles in missile defense silos. Although Russian officials do not say so directly, their actions reveal a continuing worry about their ability to command their nuclear forces in a crisis. Some of the actions that they may take to ensure their ability to retaliate, like Perimeter, may be deeply dangerous.

With China, the challenge is somewhat different. Chinese leaders appear to keep their limited number of nuclear weapons in a state of "no-alert", with the warheads stored separately. In a serious crisis, according to some training materials for Chinese officers, they intend to place these forces on alert to signal their resolve. As new mobile missiles have become available, this may mean sending road-mobile missiles out into the field and flushing ballistic missile submarines (which are not yet armed with operational ballistic missiles) into the ocean. It is not clear how an American President might respond to such a "signal" – especially if the crisis were a serious one. The recent history of US-China crisis management is not encouraging in this regard.

These challenges require not "more" deterrence, but continued attention from the United States to ensure that our overwhelming capacity to deter Russia and China is both effective and stable.

I would be pleased to answer any questions.

**Purposes and Plausible Achievements for Nuclear Testing at Various Yields**

| Yield | Countries of lesser prior nuclear test experience and/or design sophistication (including India and Pakistan) | Countries of greater prior nuclear test experience and/or design sophistication (including Russia and China) |
|---|---|---|
| Subcritical testing (permissible under a CTBT) | • Equation-of-state studies<br>• High-explosive lens tests for implosion weapons<br>• Development and certification of simple, bulky, relatively inefficient unboosted fission weapons | Same as column to the left, plus<br>• limited insights relevant to designs for boosted fission weapons |
| Hydronuclear testing (yield < 0.1 t TNT, likely to remain undetected under a CTBT) | • one-point safety tests (with difficulty) | • one-point safety tests<br>• validation of design for unboosted fission weapon with yield in 10 ton range |
| Extremely-low-yield testing (0.1 t < yield <10 t, likely to remain undetected under a CTBT) | • one-point safety tests | • validation of design for unboosted fission weapon with yield in 100-ton range<br>• possible overrun range for one-point safety tests |
| Very-low-yield testing (10 t < yield < 1-2 kt, concealable in some circumstances under a CTBT) | • Limited improvement of efficiency and weight of unboosted fission weapons compared to 1st generation weapons not needing testing<br>• proof tests of compact weapons with yield up to 1-2 kt (with difficulty) | • proof tests of compact weapons with yield up to 1-2 kt<br>• partial development of primaries for thermonuclear weapons |
| Low-yield testing (1-2 kt < yield < 20 kt, unlikely to be concealable under a CTBT) | • development of low-yield boosted fission weapons<br>• eventual development and full testing of some primaries and low-yield thermonuclear weapons<br>• proof tests of fission weapons with yield up to 20 kt | • development of low-yield boosted fission weapons<br>• development and full testing of some primaries and low-yield thermonuclear weapons<br>• proof tests of fission weapons with yield up to 20 kt |
| High-yield testing (yield > 20 kt, not concealable under a CTBT) | • eventual development and full testing of new configurations of boosted fission weapons and thermonuclear weapons | • development and full testing of new configurations of boosted fission weapons and thermonuclear weapons<br>• development and full testing of new configurations of boosted fission weapons and thermonuclear weapons |

Adapted from *Technical Issues Related to the Comprehensive Nuclear Test Ban Treaty* (Committee on Technical Issues Related to Ratification of the Comprehensive Nuclear Test Ban Treaty, Committee on International Security and Arms Control, National Academy of Sciences, 2002) p.68.


James Martin
Center for Nonproliferation Studies
Monterey Institute of International Studies

Jeffrey Lewis, Ph.D.

Jeffrey Lewis is Director of the East Asia Nonproliferation Program at the Monterey Institute of International Studies. He was Director of the Nuclear Strategy and Nonproliferation Initiative at the New America Foundation until November of 2010.

Dr. Lewis is the author of *Minimum Means of Reprisal: China's Search for Security in the Nuclear Age* (MIT Press, 2007), and is a research scholar at the Center for International and Security Studies at the University of Maryland School of Public Policy (CISSM) and a contributor to the *Bulletin of the Atomic Scientists*. Dr. Lewis also founded and maintains the leading blog on nuclear arms control and nonproliferation, ArmsControlWonk.com.

Before joining the New America Foundation, Dr. Lewis was Executive Director of the Managing the Atom Project at the Belfer Center for Science and International Affairs. Previously, he served as a Research Fellow at the Center for International and Security Studies at the University of Maryland School of Public Policy (CISSM), Executive Director of the Association of Professional Schools of International Affairs, a Visiting Fellow at the Center for Strategic and International Studies, and with the Office of the Undersecretary of Defense for Policy.

Dr. Lewis received his Ph.D. in Policy Studies (International Security and Economic Policy) from the University of Maryland and his B.A. in Philosophy and Political Science from Augustana College in Rock Island, Ill.

**DISCLOSURE FORM FOR WITNESSES**
**CONCERNING FEDERAL CONTRACT AND GRANT INFORMATION**

**INSTRUCTION TO WITNESSES:** Rule 11, clause 2(g)(5), of the Rules of the U.S. House of Representatives for the 112th Congress requires nongovernmental witnesses appearing before House committees to include in their written statements a curriculum vitae and a disclosure of the amount and source of any federal contracts or grants (including subcontracts and subgrants) received during the current and two previous fiscal years either by the witness or by an entity represented by the witness. This form is intended to assist witnesses appearing before the House Armed Services Committee in complying with the House rule. Please note that a copy of these statements, with appropriate redactions to protect the witness's personal privacy (including home address and phone number) will be made publicly available in electronic form not later than one day after the witness's appearance before the committee.

**Witness name:** Jeffrey Lewis

**Capacity in which appearing:** (check one)

_X__Individual

___Representative

*I am not the recipient of any federal grants or contracts and am not representing any organization in my testimony, but speaking in my individual capacity. Portions of my salary, however, are or have been paid by contracts received by the James Martin Center for Nonproliferation Studies (through Middlebury College) with the Defense Threat Reduction Agency (FY 2009, $1 million and FY 2010 $1.6 million, for work on range of arms control and regional nonproliferation issues) and with the Department of Energy (FY 2010, $80,000, to support training of foreign visiting fellows in nonproliferation issues).*

**If appearing in a representative capacity, name of the company, association or other entity being represented:**

**FISCAL YEAR 2011**

| federal grant(s) / contracts | federal agency | dollar value | subject(s) of contract or grant |
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**FISCAL YEAR 2010**

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**FISCAL YEAR 2009**

| Federal grant(s) / contracts | federal agency | dollar value | subject(s) of contract or grant |
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**Federal Contract Information:** If you or the entity you represent before the Committee on Armed Services has contracts (including subcontracts) with the federal government, please provide the following information:

Number of contracts (including subcontracts) with the federal government:

Current fiscal year (2011):_____;
Fiscal year 2010:_____;
Fiscal year 2009:_____.

Federal agencies with which federal contracts are held:

Current fiscal year (2011):_____;
Fiscal year 2010:_____;
Fiscal year 2009:_____.

List of subjects of federal contract(s) (for example, ship construction, aircraft parts

manufacturing, software design, force structure consultant, architecture & engineering services, etc.):

Current fiscal year (2011):_____;
Fiscal year 2010:_____;
Fiscal year 2009:_____.

Aggregate dollar value of federal contracts held:

Current fiscal year (2011):_____;
Fiscal year 2010:_____;
Fiscal year 2009:_____.

**Federal Grant Information:** If you or the entity you represent before the Committee on Armed Services has grants (including subgrants) with the federal government, please provide the following information:

Number of grants (including subgrants) with the federal government:

Current fiscal year (2011):_____;
Fiscal year 2010:_____;
Fiscal year 2009:_____.

Federal agencies with which federal grants are held:

Current fiscal year (2011):_____;
Fiscal year 2010:_____;
Fiscal year 2009:_____.

List of subjects of federal grants(s) (for example, materials research, sociological study, software design, etc.):

Current fiscal year (2011):_____;
Fiscal year 2010:_____;
Fiscal year 2009:_____.

Aggregate dollar value of federal grants held:

Current fiscal year (2011):_____;
Fiscal year 2010:_____;
Fiscal year 2009:_____.

## DOCUMENTS SUBMITTED FOR THE RECORD

OCTOBER 14, 2011

CHAIRMAN OF THE JOINT CHIEFS OF STAFF
WASHINGTON, D.C. 20318-9999

26 September 2008

The Honorable Ike Skelton
Chairman, Armed Services Committee
2206 Rayburn House Office Building
United States House of Representatives
Washington, DC 20515

Dear Mr. Chairman:

This letter affirms our strong support for the central role and continuing value of nuclear weapons in our national security strategy. Nuclear weapons provide the ultimate means of deterring attacks on the United States, our forces, and allies. The United States must maintain the credibility and effectiveness of the nuclear deterrent force and its supporting infrastructure.

The United States is the only nuclear weapons state not currently modernizing its nuclear capabilities and supporting infrastructure. While today's nuclear stockpile is safe, secure and reliable, the stockpile sustainment issues expressed by the directors of the nuclear weapons laboratories raise significant concerns. In testimony before Congress, these directors have advocated a need for a focused effort to address serious technical issues associated with maintaining a stockpile as well as concerns over the development and retention of highly skilled personnel.

A responsive nuclear infrastructure, including human capital expertise, is an essential element in maintaining a credible deterrent. The National Nuclear Security Administration's program to transform the nuclear weapons complex to a 21st century national security enterprise is a vital aspect of our path forward. We further support the life extension programs on legacy warheads, and completion of the design and cost studies for a modernized warhead with enhanced safety and security features that can assure long-term confidence in the reliability of the stockpile without nuclear testing. This study data will provide key analysis to assess the future path of the nation's nuclear posture as mandated by Congress.

We request your support in these efforts to maintain a credible deterrent. Our goal is a reliable, safe and secure nuclear stockpile, sustainable without testing, so we may continue to assure our own security and that of our allies by way of a credible nuclear deterrent.

Sincerely,

KEVIN P. CHILTON
General, USAF
Commander USSTRATCOM

M.G. MULLEN
Admiral, U.S. Navy

Copy to:

The Honorable Duncan Hunter, Ranking Member
Chief of Staff United States Army
Commandant of the Marine Corps
Chief of Naval Operations
Chief of Staff United States Air Force

# Executive Summary

*"Hidden truth"* [隐真] *is to make rational deployment of … the favorable terrains of the positions of the Second Artillery Corps and pre-constructed concealed tunnels….*[i]

On 11 December 2009 China officially announced that it had spent the last 25 years constructing a "mysterious" 3,000 mile long complex of tunnels for hiding missiles and nuclear warheads called the "Underground Great Wall."[ii] In August 2011, the US Department of Defense publicly confirmed the Chinese statement;[iii] but, up to now, the significance of this massive effort has not been seriously discussed in terms of either its strategic or arms control impact. Specifically:

- By Chinese admission, the purpose of these hundreds of tunnels is to hide nuclear warheads and their delivery means so that we have no independent means of verifying the location, numbers and types of weapons located in them – uncertainty over what and how much is hidden underground being fatal for a national policy headed toward a "World Without Nuclear Weapons;"
- The PLA's "Underground Great Wall" is designed as a warfighting system, involving deployment from one complex to another and salvoing multiple reloads in a conventional conflict; but most of these tactical and theater ballistic missile units are "dual-capable" and cover the Western Pacific where US forces and our Allies have no equivalent – an asymmetric posture that will ultimately force the US to exit the INF Treaty with Russia or include China;
- China's new generation of road/rail mobile ICBM's are being deployed in the new very large tunnels, which, IF coupled with the potential for underground reload/refire and MIRV warheads, could pose a dramatically larger nuclear threat to American cities – and undermine bipolar Strategic Arms Reduction agreements that do not constrain the potential of PRC strategic expansion.

The combination of these three elements seriously undermines the American nuclear guarantee to our traditional allies in Asia. Uncorrected, it is likely to lead those threatened to develop their own independent nuclear deterrents obviating the Nuclear Non-Proliferation Treaty. Equally important and dangerous, if the tunnel deployed ballistic missile force is not addressed until a regional conflict focuses our attention, the asymmetric imbalance could be both dangerous to United States forward deployed forces and extremely destabilizing in a crisis.

goals of establishing a permanently manned space station by 2020 and landing a human on the moon by 2030.

***Position, Navigation, and Timing (PNT):*** Since the 1990s, China has used the U.S. Global Positioning System (GPS) for a wide variety of military, civil, and commercial applications. Building on this foundation, China is pursuing several avenues to reduce its dependence on GPS and become a major supplier of PNT services and user equipment. Currently, the PRC is increasing its use of Russia's GLONASS, deploying its own BeiDou-2 (Compass) system as well as a second independent satellite system called CAPS, while augmenting these overhead systems with a variety of ground-based signals.

The experimental BeiDou-1 system consisted of just three satellites, providing both civil and military services to China. China is replacing BeiDou-1 with the much larger BeiDou-2 constellation, intended to eventually provide a worldwide PNT service, independent of foreign control. By 2012, the BeiDou 2 constellation is expected to provide regional services with approximately 10 satellites. The PRC plans to complete the BeiDou-2 system by 2020, with 35 a satellite constellation offering global coverage.

***Communications:*** China uses communications satellites for both regional and international telecommunications in support of civil and military users, including satellite television, Internet, and telephony. China also maintains a single data-relay satellite launched in mid-2008, the TianLian-1. China has recently entered the world market by exporting satellites and infrastructure to Venezuela and Nigeria. Although the satellite built and launched for Nigeria failed, China continues to market its services worldwide, to customers such as Pakistan, Bolivia, Laos, and Vietnam.

**PLA Underground Facilities**

Since the early 1950s, the PLA has employed underground facilities (UGFs) to protect and conceal its vital assets. China's strategic missile force, the Second Artillery Corps (SAC), has developed and utilized UGFs since deploying its oldest liquid-fueled missile systems and continues to utilize them to protect and conceal their newest and most modern solid-fueled mobile missiles. As early as the mid 1990's Chinese media vaguely acknowledged the existence of UGFs that support the SAC. Since December 2009, several PRC and foreign media reports offered additional insight into this obscure tunnel network, which reportedly stretches for over 5,000 km.

Given China's nuclear policy of "no first use" and until recently its limited ballistic missile early warning capability, Beijing had assumed it might have to absorb an initial nuclear blow prior to engaging in "nuclear counterattack." Nuclear survivability was particularly critical given China's relatively small number of nuclear weapons and the development by potential adversaries of modern, precision munitions. In recent years, advanced construction design has allowed militaries to go deeper underground to complicate adversarial targeting.

Although secrecy and ambiguity remain China's predominant approach in the nuclear realm, occasional disclosure of information on some missile-related UGFs is consistent with an effort to send strategic signals on the credibility of its limited nuclear arsenal. These public disclosures include images of tunnels, modern network-based security and control centers, and advanced camouflage measures. Categories of military facilities which make good candidates for UGFs include: command posts; communications sites; storage for important weapons and equipment; and protection for personnel.

## QUESTIONS SUBMITTED BY MEMBERS POST HEARING

OCTOBER 14, 2011

## QUESTIONS SUBMITTED BY MR. TURNER

Mr. TURNER. Your opening statement mentions open source evidence that Russia may be in violation of the Intermediate Nuclear Forces (INF) Treaty. Please explain the evidence for this, and what the implications of this should be for the United States going forward.

Dr. SCHNEIDER. Under the INF Treaty, ground-launched cruise missiles with a range of 500-km to 5,500-km are prohibited. To violate the INF Treaty, a ground launched cruise missile would merely need to have the range potential to fly to such a range. A ballistic missile would have to demonstrate a range between 500 and 5,500-km.

There are a substantial number of Russian press reports that state that the R–500, a ground launched cruise missile first tested by Russia in 2007 and associated with the nuclear capable Iskander missile system, has a range between 1,000 and 3,000-km. Two of these reports say that the R–500 is actually a derivative of the Soviet cruise missile eliminated by the INF Treaty. One of the reports says that the R–500 missile exceeded 500-km in its first flight test. Another suggests there is also a second prohibited missile. The journals that published these reports are well known (including four in an official government news agency), and the authors are well known military reporters and arms control experts. These individuals range from pro-regime to anti-regime. It is also clear that these reports are not multiple publications treating a single story because they widely separated in time and in some detail.

One well known Russian journalist reports that Russian surface-to-air missiles and missile defense interceptors have a secondary surface-to-surface (SAMs) nuclear attack role. The INF Treaty has an exception for air and missile defense interceptors that are used ***solely*** for this purpose. It does not permit SAMs to have a dual role.

Since these missiles would be classified as ballistic missiles under the Treaty, it requires testing to a prohibited range to violate the Treaty.

It is clear that the Moscow ABM, if the report is true, violated the INF Treaty from its entry-into-force and the S–500 air/missile defense would violate the Treaty when it is fully tested. Whether the S–300 and S–400 surface to air missiles violate the INF Treaty would depend upon their testing history.

These are very serious issues. If these reports are true, Putin's Russia has returned to the worst arms control behavior of the Soviet Union. Violating the "zero option" arms control treaty sends a clear message about the danger of the pursuit of "nuclear zero." If these reports are true, this is an issue that literally must be resolved by Russian resumption of Treaty compliance. If this does not happen, I believe the U.S. should withdraw from the INF Treaty.

Mr. TURNER. You mentioned that Russia is developing low-yield, precision nuclear weapons. These would appear to be a "new" nuclear weapon for the Russia arsenal. Does Russia have any policy against developing "new" nuclear weapons? What are the implications to the U.S. and our allies if Russia continues developing these new nuclear weapons capabilities while the U.S. simply maintains its current, aging nuclear weapons?

Dr. SCHNEIDER. Russian leaders openly and repeatedly say Russia is developing and deploying new nuclear weapons, and this is reported in the Russian press in more detail. Former Defense Minister Sergei Ivanov characterized them as "unique" which may be a reference to their low collateral damage designs. There are two declassified, if highly redacted, CIA reports on the subject of Russian development of low yield nuclear weapons. In the words of then-Secretary of Defense Robert Gates, "China and Russia have embarked on an ambitious path to design and field new weapons."

Russian development efforts, combined with hydronuclear testing, places us at a great disadvantage. As then-Secretary of Defense Robert Gates observed in 2008, "At a certain point, it will become impossible to keep extending the life of our arsenal, especially in light of our testing moratorium. It also makes it harder to reduce existing stockpiles, because eventually we won't have as much confidence in the efficacy of the weapons we do have. Currently, the United States is the only declared

nuclear power that is neither modernizing its nuclear arsenal nor has the capability to produce a new nuclear warhead . . . To be blunt, there is absolutely no way we can maintain a credible deterrent and reduce the number of weapons in our stockpile without either resorting to testing our stockpile or pursuing a modernization program." We have done neither.

We cannot replicate old tested designs exactly. As we correct problems in our stockpile, we are making changes. As Secretary Gates said in 2008, "With every adjustment, we move farther away from the original design that was successfully tested when the weapon was first fielded. Add to this that no weapons in our arsenal have been tested since 1992. So the information on which we base our annual certification of stockpile grows increasingly dated and incomplete." We are rapidly losing experienced designers due to aging and retirements. There is a potential of a major asymmetry in weapons reliability developing due to Russian hydronuclear testing and recent design experience.

Rebuilding our nuclear weapons infrastructure is critically important, but we must recognize that this alone does not mean our life extended nuclear weapons will actually work. If our primaries do not develop sufficient yield, the weapons will be duds.

The combination of the enormous asymmetry in modernization of our delivery systems and the risk of loss of deterrent reliability due to lack of testing must increase concerns among our allies, particularly in Eastern Europe, who feel threatened by Russia and have been subject to direct nuclear targeting threats. The asymmetry in low yield and low collateral damage weapons may also increase the risk of Russian use of such weapons in a crisis.

Mr. TURNER. Do you believe that the nature, effectiveness, and credibility of our extended deterrent relationships with allies are affected by nuclear weapons and delivery system modernization efforts in Russia and China when compared with our own here in the United States?

Dr. SCHNEIDER. Yes. Some of our allies are very concerned about the Russian and Chinese threat. Others are concerned about Iranian and North Korean nuclear capabilities. They will become increasingly concerned as their capabilities increase and the modernization asymmetry grows. To characterize the minimal changes we are making in our delivery systems as "modernization" is not realistic when we are not generally enhancing military capabilities which are potential adversaries are doing all the time. Irrespective of how reluctant our allies are to develop their own nuclear deterrent capabilities, I believe at some point they will be tempted to develop nuclear weapons due to limitations in our deterrent, extended deterrent and damage limiting potential.

We do not have the right types of nuclear weapons for effective extended deterrence and current policy precludes any changes in our posture. Our deterrent force is aging and "modernization" efforts are generally not increasing our military potential. Our potential enemies are not doing the same. To quote then-Secretary of Defense Robert Gates, "Currently, the United States is the only declared nuclear power that is neither modernizing its nuclear arsenal nor has the capability to produce a new nuclear warhead."

Mr. TURNER. Dr. Lewis said in his opening remarks that in his opinion, "Russia and China could not, however, develop new nuclear weapons with yields that I would consider militarily significant without conducting tests large enough to be readily detected." Do you agree that Russia and China cannot conduct militarily significant nuclear weapons tests without being detected? What, if anything, do open sources indicate China and Russia are doing in the nuclear testing arena? Are they complying with the terms of the Comprehensive Test Ban Treaty? What are the implications of this to the U.S. and our allies?

Dr. SCHNEIDER. No. There is extensive evidence that both Russia and China are deploying new and improved nuclear weapons. Their leaders say this. In 2005, Russia's Defense Minister Sergei Ivanov said, "*New types* of nuclear weapons are already emerging in Russia." Colonel General Vladimir Verkhovtsev, then-chief of the Defense Ministry's 12th Main Directorate which handles Russian nuclear weapons, said Russia is deploying "***new nuclear weapon*** complexes . . . . ***that possess improved specifications and performance characteristics*** . . ." (Emphasis added). In April 1999, then-Security Council Secretary Vladimir Putin said that the three Presidential decrees signed by Yeltsin "concern the development of the whole nuclear weapons complex and the endorsement of the concept of the ***development and use of strategic nuclear weapons.***" (Emphasis added). Nikol Voloshin, a senior official of the Ministry of Atomic Energy, revealed in June 2001 that work was nearing completion on a warhead for the Topol-M (SS–27), while "At the same time modernization is proceeding on the other warheads." The SS–27 warhead is clearly a new design because as Colonel-General Nikolay Solovtsov and Lieutenant General

Vitaliy Linnik, Head of Armament and Deputy Commander of Strategic Missile Troops both have stated, the SS–27 warhead has an "enhanced-yield charge" or "an increased yield." To increase the yield of a thermonuclear weapon it is necessary to redesign the secondary. Ivanov stated that the SS–27/RS–24 MIRV warhead was a "new warhead" and that it is the same warhead being used on the Bulava 30. In September 2003, Lev Ryabev, Deputy Atomic Energy Minister, stated that young Russian scientists are "doing real things" with the goal of "keeping and improving of Russia's nuclear arsenal."

A declassified August 2000 CIA Intelligence Memorandum concluded that, "Judging from Russian writing since 1995 and Moscow's evolving nuclear doctrine, new roles are emerging for very-low yield weapons—including weapons for tailored radiation outputs." On April 29, 1999, President Yeltsin reportedly ordered Russian development of precision low yield nuclear weapons that could be used for strategic or tactical nuclear strikes.

There are multiple Russian press reports which say Russia now has a new strategic nuclear warhead in the 100-kiloton/100-kilogram range. Some of these and other reports say their best Cold War design was 110–130-kilogram and yielded 50–75 kilotons. The reports of 100-kg warheads are consistent with the throw-weight and nuclear warhead numbers per missile declared for the new Bulava 30 SLBM under the START Treaty. Two Russian generals have said that Russia increased the yield of the SS–27 single warhead. The numerous Russian press reports that both the SS–27/RS–24 and the Bulava 30 will carry 10 warheads would require further improvement of Russian yield-to-weight ratios in small and light warheads. I have traced the report about the SS–27/RS–24 10 warhead capability back to a statement by the Russian Defense Ministry.

Russian nuclear weapons development has not been limited only to increasing yield-to-weight ratios. In November 1997, Viktor Mikhaylov, then-Atomic Energy Minister, stated that Russia was working on a weapon "which penetrate[s] the ground before exploding. I must say that our developments here are at the highest level . . . . Right now we are standing firm." In December 2002, he stated that, "The scientists are developing a nuclear 'scalpel' capable of 'surgically removing' and destroying very localized targets. The low-yield warhead will be surrounded with a superhardened casing which makes it possible to penetrate 30–40 meters into rock and destroy a buried target—for example, a troop command and control point or a nuclear munitions storage facility."

There are Russian press reports that say Russia is conducting hydronuclear testing. The Russian press reported that President Yeltsin's April 29, 1999, decree on nuclear weapons approved "hydronuclear field experiments." Recent Russian press accounts indicate that hydronuclear testing actually began in 1994. In November 2010, Alexei Fenenko of the Russian National Academy of Scientists wrote that over the past 15 years, "significant progress" was made in hydronuclear testing.

Hydronuclear tests that are designed to produce measurable nuclear yields are inconsistent with a zero-yield CTBT or zero-yield moratorium Russia claims to be observing. It is very interesting that then-First Deputy Minister for Nuclear Energy Viktor Mikhaylov, on April 29, 1999, wrote about the importance of hydronuclear testing to maintaining the nuclear arsenal. He stated: "No state will be able to create nuclear weapons for the first time based solely on hydronuclear experiments . . . But developed traditional nuclear powers can use hydronuclear experiments to perform tasks of improving reliability of their nuclear arsenal and effectively steward its operation. All countries indirectly gain here inasmuch as the risk of nuclear accidents is lowered. Determining the limits of 'authorized activity' is no simple process and only professionals can direct it correctly." In July 2001, Mikhaylov said that, "The fact is that the developed, traditional nuclear powers, using hydronuclear experiments, can perform the task of improving reliability of the nuclear arsenal and effectively track its operation while reducing the risk of possible accident."

These official statements clearly suggest that Russia was conducting hydronuclear explosions and that Mikhaylov wanted to keep this activity under the complete control of the Nuclear Energy Ministry for obvious reasons. Why else should Mikhaylov be talking about the importance of hydronuclear testing when it was prohibited by the Comprehensive Test Ban Treaty and the testing moratorium Russia was claiming to observe? Such disregard for political commitments and legal obligations would be consistent with past Soviet behavior and the Russian actions documented in the Department of State's August 2005 report on adherence to arms control agreements, which recorded a continuing pattern of Russian treaty violations. Such tests would be useful for the development of new nuclear weapons.

Numerous declassified, but unfortunately heavily redacted, Clinton administration CIA intelligence reports discussed possible Russian nuclear testing and whether it was related to the development of new warheads. One declassified CIA report con-

cluded that "hydronuclear (low-yield) experiments . . . are far more useful for Russian weapons development" than subcritical tests. At a minimum, these reports indicate that the CIA took this possibility very seriously.

As stated in my prepared statement, the Russian Atomic Energy Ministry has said that hydronuclear testing improves both the reliability and safety of nuclear weapons. It also revealed that the Soviet Union had conducted 89 atmospheric hydronuclear tests until 1989. I do not believe we can assume that hydronuclear tests are the only thing that the Russians are now doing simply because that is what is reported in the Russian press. The verification threshold of the CTBT is high enough to permit testing of sufficient yield to develop new strategic as well as new tactical nuclear weapons.

Any covert Russian nuclear testing significantly increases the threat to the U.S. and our allies.

Mr. TURNER. Do you believe a potential U.S. minimum deterrence posture, whereby we maintain a small number of nuclear warheads and threaten retaliation against enemy cities if attacked, is credible? Why or why not? How would such a posture by the U.S. affect our extended deterrent and efforts to prevent proliferation of nuclear weapons?

Dr. SCHNEIDER. No. As then-Under Secretary of Defense Walter Slocombe told the Senate Armed Services Committee in 2000, we do not target cities. Even if we changed our policy, I don't believe that massively disproportionate threats are an effective deterrent since we are likely to be self deterred from such action and our adversaries know this.

Allied governments that are worried about their security will be concerned about minimum deterrence because it minimizes deterrent credibility, maximizes collateral damage and minimizes damage limiting capability. It is impossible to substitute effectively conventional capability for nuclear deterrence because of the vulnerability of conventional weapons to nuclear EMP and their extremely inadequate capability against hard and deeply buried facilities. As Margaret Thatcher once observed, every town in France has a monument to the failure of conventional deterrence.

Mr. TURNER. The Obama Administration is currently conducting a 90-day "NPR Implementation Study," which will likely result in changes to U.S. nuclear weapon employment guidance. According to senior administration officials, including President Obama's National Security Advisor, Tom Donilon, it could also set the stage for unilateral reductions in U.S. nuclear forces. How would unilateral U.S. reductions or changes to the employment guidance be perceived by leaders in Russia and China? Do you believe we have sufficiently certain information on the nuclear forces and policies of China and Russia to enable unilateral U.S. reductions or major shifts in employment policy without undue risk?

Dr. SCHNEIDER. I think Russia and China would interpret minimum deterrence as enhancing the value of their nuclear capabilities. I suspect we would see even more nuclear threats from Russia and China. Russia would clearly have nuclear superiority and China would have an easier option to achieve it. While there are always limitations in our intelligence about Russia and China, I think their basic attitudes toward nuclear weapons are clear and minimum deterrence would translate into minimum security for the U.S. and our allies.

Mr. TURNER. The open-source information available on Chinese nuclear forces, strategy, and production is extremely limited. China claims this deliberate "opaqueness" and the associated uncertainty is needed to ensure the effectiveness and survivability of their so-called "minimum deterrence" force. Our forces are reasonably transparent, particularly with President Obama's decision to release numbers on the size of our nuclear stockpile and data exchanges related to the New START Treaty. a. What is your assessment of China's deliberate policy of opaqueness on its nuclear forces? b. If we continue making further reductions on the "path to global zero", at what point does China's opaqueness reach a critical line, where we cannot continue to reduce our forces without unacceptable risk? c. What are—or should be—the impacts of this opaqueness on the nuclear strategies of the U.S. and other countries?

Mr. FISHER. China has been fairly consistent and consistently hypocritical. China bewails the nuclear weapons excesses of the United States and Russia but refuses to take even initial steps toward transparency for its nuclear forces that could set the stage for subsequent dialogue that could lead to stability. China's consistent effort to put the burden on others to reduce their nuclear weapons certainly raises suspicions about what they are doing for their own nuclear capability. Given China's potential to arm new DF–5 versions and the "DF–41" ICBMs with multiple warheads, it is even more important that the U.S. not reduce its nuclear arsenal to pursue some ideological "path to global zero" that China does not show any sign of agreeing with. Reductions already made by the Administration are unwise given

China's potential to increase its nuclear arsenal and further U.S. reductions would only compound this error.

Mr. TURNER. China says that it maintains a minimum deterrence posture designed to deter nuclear attacks on its homeland. But China is also known to be seeking military capabilities to expand its sphere of security influence beyond its borders. Do you believe China will retain a minimum deterrence posture towards its nuclear weapons as it seeks a greater security role beyond its shores? Under what circumstances might it seek to move toward a more aggressive deterrence posture with higher numbers of nuclear weapons and delivery systems and higher alert levels?

Mr. FISHER. I believe that it is plausible to expect that as China seeks a globally capable conventional military force, it will also seek a much larger "world class" nuclear force. China will build greater numbers of large ICBMs and new SSBNs to deter the U.S., Russia and India. China will quietly welcome further U.S. nuclear reductions as that will reduce the difference to U.S. force levels, adding its ability to deter Washington from defending its interests. I would suggest that a Chinese force of 500 defended warheads would significantly undermine the U.S. extended nuclear deterrent in the minds of our Asian allies. China's nuclear forces will increase further should Japan, South Korea, Vietnam or Australia decide to pursue a nuclear deterrent.

In addition, the United States needs to devise its own public definition about what comprises a "minimum" nuclear deterrent. China may have ideas that 200 to 300 warheads could still constitute a "minimum" deterrent compared to the nuclear forces of Russia and the United States. But it is not clear that Japan, South Korea, Australia, Vietnam and Taiwan, all states with the potential to pursue their own nuclear deterrent, will also view such Chinese warhead numbers as a "minimum" level.

Mr. TURNER. Do you believe that the nature, effectiveness, and credibility of our extended deterrent relationships with allies are affected by nuclear weapons and delivery system modernization efforts in Russia and China when compared with our own here in the United States?

Mr. FISHER. Today, based on what is known about China's nuclear forces, U.S. extended nuclear deterrence is credible, but not as credible as when U.S. naval forces had access to secure submarine launched nuclear LACMs. North Korea's reported development of a mobile ICBM to complement their mobile IRBMs only increases the need for a U.S. secondary or tactical nuclear deterrent in Asia. With the retirement of the TLAM–N and the decision to rely on aircraft delivered tactical nuclear weapons, this element of the U.S. deterrent is now vulnerable to North Korea's and China's expansive air defenses. Furthermore, if forced to use ICBMs or SLBMs to counter a North Korean long range missile strike, the U.S. increases the risk that China or Russia will misinterpret the U.S. move and potentially launch their own nuclear missiles. In addition, should the PRC succeed in increasing its warhead levels to 500, and a BMD system to defend them, that would significantly undermine the credibility of the U.S. extended nuclear deterrent in the minds of Allied leaders in Asia.

Mr. TURNER. Dr. Lewis said in his opening remarks that in his opinion, "Russia and China could not, however, develop new nuclear weapons with yields that I would consider militarily significant without conducting tests large enough to be readily detected." Do you agree that Russia and China cannot conduct militarily significant nuclear weapons tests without being detected? What, if anything, do open sources indicate China and Russia are doing in the nuclear testing arena? Are they complying with the terms of the Comprehensive Test Ban Treaty? What are the implications of this to the U.S. and our allies?

Mr. FISHER. I believe that measures being taken by the U.S. to use advanced computer techniques to help verify or even design new nuclear weapons are also techniques being sought by Russia and China. As for China, we know little about what passes for sufficient nuclear testing. China may accept a lesser degree of testing for a new weapon design.

Mr. TURNER. Do you believe a potential U.S. minimum deterrence posture, whereby we maintain a small number of nuclear warheads and threaten retaliation against enemy cities if attacked, is credible? Why or why not? How would such a posture by the U.S. affect our extended deterrent and efforts to prevent proliferation of nuclear weapons?

Mr. FISHER. I do not believe the U.S. has the option both to pursue realistic "minimum deterrence posture" and to preserve its security and freedom. It can have one, but not the other. China would take a U.S. decision to pursue a minimum nuclear deterrent posture as a license to invade Taiwan, enforce its territorial claims in the East China Sea and impose military control over the South China Sea. Such a U.S.

decision would also pitch China into an even higher paced general military buildup in order to accelerate its quest for global military dominance to displace the United States. After doing so China would then seek a series of confrontations with Washington to develop a system for American subordination to China's dictat.

Mr. TURNER. The Obama Administration is currently conducting a 90-day "NPR Implementation Study," which will likely result in changes to U.S. nuclear weapon employment guidance. According to senior administration officials, including President Obama's National Security Advisor, Tom Donilon, it could also set the stage for unilateral reductions in U.S. nuclear forces. How would unilateral U.S. reductions or changes to the employment guidance be perceived by leaders in Russia and China? Do you believe we have sufficiently certain information on the nuclear forces and policies of China and Russia to enable unilateral U.S. reductions or major shifts in employment policy without undue risk?

Mr. FISHER. I do not believe that the U.S. has sufficient information about China's nuclear forces to take the decision to pursue unilateral nuclear reductions. To pursue new unilateral U.S. warhead reductions without verifiable data on China's nuclear order of battle, its nuclear modernization plans, its real nuclear doctrine, its plans for missile defenses and its plans for outer space warfare, would severely damage American national security.

According to open reports, a new study by Dr. Phil Karber of Georgetown University on China's expansive, possible 5,000km long network of tunnels, undermines confidence in the open reporting by the Department of Defense about China's current nuclear missile numbers. While this report does not suggest an actual new estimate, the sheer size of the tunnel network devoted to hiding China's nuclear missile arsenal strongly suggests Chinese missile numbers may handily exceed open DoD estimates. Until such a time that China decides to provide verifiable assurance that its missile numbers are close to open U.S. estimates, the United States should not be considering further unilateral reductions in U.S. warhead numbers.

Mr. TURNER. Russian leaders have been talking about deploying by 2018 a new, heavy, silo-based intercontinental ballistic missile (ICBM) that will carry multiple independently targetable re-entry vehicles (i.e., it will be "MIRV'd"). Some experts indicate this system would greatly detract from crisis stability, because its fixed location makes it vulnerable and Russian leaders would face a very short "use-it-or-lose-it" decision timeframe. Why is Russia contemplating deploying this system? What are the benefits to Russia? What, if anything, should be the U.S. response if Russia deploys this system? How should this decision by Russia impact U.S. decisions about our nuclear force structure and policy?

Dr. LEWIS. Among Russian defense entities, there appears to be a debate about the need for new liquid-fueled ballistic missiles. The process leading to the award of a contract appears to reflect internal politics among Russia's design bureaus more than any specific strategic rationale. As such, the long-term commitment of the Russian leadership to a new liquid-fueled Heavy ICBM remains uncertain.

New Russian Heavy ICBMs, if based in vulnerable fixed sites, may undermine strategic stability by exacerbating Russian fears about the survivability of their forces during a crisis with the United States. The United States should seek to prevent or curtail deployment of such missiles through arms control negotiations.

That said, the main Russian concern appears to be the vulnerability of its leadership and command and control system to a "decapitating" first-strike that denies Russia the ability to retaliate against a nuclear attack. Managing fear in Moscow about the viability of its command and control system remains, in my view, the most important path to enhancing strategic stability. The United States should continue to invest in command, control and communications capabilities to maximize a U.S. President's decision-time in a crisis, as well as continue to engage Russian leaders on measures to reassure them that the United States does not seek a decapitating first strike against the Russian Federation. The United States has never sought such a capability and it is not in our interest for Russian leaders to be confused about that fact.

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## QUESTIONS SUBMITTED BY MS. SANCHEZ

Ms. SANCHEZ. Should U.S. modernization of its nuclear weapons be tied to Russian or Chinese modernization? Why/why not? How does the effectiveness of Russia and China's nuclear deterrent compare to ours? And given what we know of the different models for maintaining nuclear weapons, would you trade our nuclear weapons for China's or Russia's?

Dr. SCHNEIDER. Yes, although we should also modernize to deal with rogue state threats in the most effective manner. As then-Secretary Gates stated in 2008,

"There is no way to ignore efforts by rogue states such as North Korea and Iran to develop and deploy nuclear weapons or Russian or Chinese strategic modernization programs."

Russia already has nuclear superiority due to its 10-to-1 advantage in tactical nuclear weapons. As former Under Secretary of Defense Ambassador Robert Joseph put it, we are now "Second to One." There is no way we can freeze the capability of our strategic missiles at the technical level we achieved between 1970 and 1990 without the Russians pulling ahead (which seems already to have happened) in most areas, with the exception of perhaps SSBN quietness and stealth levels.

Even without U.S. unilateral cuts, I believe China will gradually reduce the gap in numbers and technology and eventually pull ahead, if we stand still. There are many reports in the Asian press of Chinese plans to MIRV their new strategic missiles extensively, although no time frame is given. Despite inferior technology, China now has extensive regional missile capability with near precision accuracy. This Chinese advantage is going to grow simply because they are introducing new and improved missiles and we are doing nothing to improve accuracy. The Chinese, according to *Aviation Week,* are developing a 4,000-km range ballistic missile with a nuclear capability.

Russian and Chinese strategic nuclear forces would not be suitable for the U.S. We cannot operate mobile ICBMs, build extensive tunnel facilities because of their cost, live under their standards of safety or match their manpower commitments. It would be useful for the U.S. to have elements of their tactical and theater nuclear capability, but it would have to be an American version of their capability built to our standards.

Ms. SANCHEZ. What role, benefits and risks are there for further nuclear arms control measures given Russian and Chinese nuclear weapons modernization efforts and plans?

Dr. SCHNEIDER. Arms control can only have a positive security impact if it is complied with. The Soviet Union/Russia has a poor compliance record. The lower we go in nuclear weapons, the greater the risk of cheating and the consequences of cheating. New START, with its degraded verification regime, is not a good basis for additional arms control. We need the restoration of a slightly modified START telemetry regime and the restoration of continuous monitoring of mobile ICBM production. The New START warhead counting regime needs major surgery so that we can accurately count deployed warheads.

Despite its arms control rhetoric, I see little indication that the Obama administration is pressing Russia on future arms control, which Russia does not want. Indeed, according to Sergey Karaganov, Dean of the Faculty of the Moscow World Economics and Politics at the National Research University-Higher School of Economics, "For the time being, in order not to lose what has been achieved, the White House . . . refrained from pushing for the beginning of negotiations on reducing nonstrategic or tactical nuclear weapons in Europe, in which Russia is many times superior in terms of numbers. This is why Moscow does not want these negotiations." Press reports concerning high level meetings in 2011 talk almost completely about the Russian missile defense agenda. Obama administration statements concerning future negotiations about tactical nuclear weapons do not talk about negotiations any time soon. Nor are they talking about fixing the problems with START. They generally talk about "transparency" rather than "verification." One statement by NSC Arms Control Coordinator Dr. Gary Samore sounds like they are thinking about transparency rather than limits on tactical nuclear weapons.

Statements by administration officials about unilateral reductions make no sense if the administration plans near term arms control negotiations concerning its announced agenda—further reductions in strategic nuclear forces and limits on tactical nuclear and non-deployed nuclear weapons of all types. Moreover, there is an obvious disconnect between this agenda and the lack of limitations in New START on non-deployed mobile ICBMs which is one of the main cheating threats.

Ms. SANCHEZ. What impact would the Comprehensive Test Ban Treaty (CTBT) have on stemming nuclear weapons modernization, particularly for China? And what are Russia and China's positions on the CTBT?

Dr. SCHNEIDER. The CTBT is not impacting Russia or China, both of which are extensively modernizing their nuclear forces. There are reports that both Russia and China are engaging in hydronuclear testing.

In the 1990s, the Russian Atomic Energy Ministry, in a report in which then-Atomic Energy Minister Viktor Mikhaylov personally participated in drafting, said that Soviet hydronuclear tests "played an important role in the analysis of the safety and ***reliability of nuclear weapons.***" (Emphasis added).

The detection threshold for decoupled nuclear tests and tests conducted in salt mines is too high to prevent covert testing that can allow the development of new

advanced nuclear weapons. I would recommend that the Committee review the recent NIE on the CTBT and compare it in detail to the comparable assessments made in the NIE written during the Clinton administration. I would also recommend that the Committee obtain classified briefings from the National Laboratories concerning what is possible at various testing yields for nuclear weapons development.

A 2002 National Academy of Sciences report concluded that, with a fully functional International Monitoring System, "an underground nuclear explosion cannot be confidently hidden if its yield is larger than 1 or 2- kt." It said that cavity decoupling had achieved a signal-reduction factor of 70 in a 400-ton yield. A January 2001 study by Dr. William Leith of the U.S. Geological Survey concluded that, "In thick salt deposits and domes, it is feasible to construct cavities of sufficient volume and dimensions for full decoupling of an underground nuclear explosion larger than 10 kt . . . . Above 10 kt, the resulting seismic event . . . might be detected, and located by the fully-functioning CTBT International Monitoring System (the southern hemisphere, this threshold will be higher) . . . . [S]uitably thick salt deposits are present in many naturally-seismic regions that are also areas of nuclear proliferation concern (e.g., Iran, Iraq, Syria, China, Russia) . . ." Dr. Leith also concluded that: "At yields less than about 1 kt, any country desiring to decrease the seismic signal from a small underground nuclear explosion can do so by detonation in a deep, moderate-size, elongated cavity mined in high-strength, low porosity rock (e.g., granite) or, if available, in salt. The construction of such a cavity is not limited by the available mining technology, based on numerous examples of underground construction at depth, worldwide . . . . With careful site selection, the decoupled event would not be large enough to be detected seismically, for broad areas of most countries."

CTBT verification involves monitoring more than known test sites. A September 2001 study by Vitaly V. Adushkin and William Leith reported that the Soviet Union conducted 117 nuclear tests outside of nuclear weapons test sites. In 1999 Principal Deputy Atomic Energy Minister Viktor Mikhaylov revealed that nuclear tests had been conducted in 16 areas of the U.S.S.R. Indeed in one of these tests, "Soviet scientists set off a nuclear blast in 1979 next to a Ukrainian coal mine, then sent thousands of miners back to the shaft a day later without telling them," and that Soviet "officials had disguised the incident by staging a civil defense drill and evacuating the town's 8,000 residents, most of whom were miners." While Russia could not do this today in an inhabited area, Siberia is a very large place and largely unpopulated.

Dr. Paul C. Robinson, then-Director of the Sandia National Laboratory (SNL), in 1999 Congressional testimony on the CTBT stated that he was "concerned by the erroneous claims" that the CTBT "prohibits the United States or any other nation from deploying new nuclear weapon designs or adapting existing nuclear explosives for new warheads." The main failure mechanism in a thermonuclear weapon is the primary, which if it delivers inadequate yield, will result in a dud. Covert nuclear testing undetectable under the CTBT can be used to develop and certify new primaries. Even the pro-CTBT 1995 JASON report concluded that:

> For the U.S. stockpile, testing under a 500 ton yield limit would allow studies of boost gas ignition and initial burn, which is a critical step in achieving full primary design yield. The primary argument that we heard in support of the importance of such testing by the U.S. is the following: the evidence in several cases and theoretical analyses indicate that results of a sub-kiloton (~500 tons) test of a given primary that achieves boost gas ignition and initial burn can be extrapolated to give some confidence in the yield of an identical primary with full boosting. Therefore, if a modified or remanufactured primary is introduced into the stockpile in the future to correct some aging problem, such tests on the modified system would add to confidence that the performance of the new primary is still adequate.

Much higher yield tests than 500-tons yield can be conducted without detection with decoupling, testing outside of known test sites or in SALT mines. There is also the possibility of covert tests conducted at sea to hide the nationality of the test or in deep space. These higher tests would have still greater implications for weapons development.

In October 1999 *The New York Times* reported that, "In a new assessment of its capabilities, the Central Intelligence Agency has concluded that it cannot monitor low-level nuclear tests by Russia precisely enough to ensure compliance with the Comprehensive Test Ban Treaty . . ." Senator Richard Lugar (R–IN) concluded that, "I have little confidence that the verification and enforcement provisions will dissuade other nations from nuclear testing." During the 1999 CTBT debate, then-

Sandia National Laboratory (SNL) Director Dr. Paul Robinson stated that, "unfortunately, compliance with a strict zero-yield requirement is unverifiable" and, "If the United States scrupulously restricts itself to zero yield while other nations may conduct experiments up to the threshold of international delectability, we will be at an intolerable disadvantage."

Russia and China support the CTBT. If they are covertly testing as press reports say, it gives them a substantial advantage.

Ms. SANCHEZ. Understanding the Chinese and Russian current and planned modernization efforts, should the U.S. change its current nuclear posture and policy, including numbers and targeting? Why, why not?

Dr. SCHNEIDER. I believe we must modernize each leg of the TRIAD. I would accelerate efforts to develop the new nuclear cruise missile because of the defense penetration and sustainment problems with the existing ALCM. I believe that some B–61s should be given glide bomb capability to better counter advanced defenses. We need to start work on new large solid rocket motors in order not to lose design capability and be able to replace our ICBM force in 2030. I would also look at ways to upgrade our missile accuracy at modest cost. Creating a sub-strategic capability for our Minuteman ICBM and Trident II, similar to the U.K. sub-strategic Trident capability, is possible at extremely low or zero cost if done as part of a life extension program.

I would not make any unilateral cuts in our nuclear capability. Cuts will increase the prospect of China deciding to match us in numbers and make the implication of the Russian nuclear advantage worse. Indeed, if we are going to attempt to achieve a new arms control agreement with Russia, this is the worst possible thing to do from the standpoint of negotiating leverage. Russia will see unilateral nuclear cuts as enhancing its leverage concerning nuclear threats and they will have no incentive to agree to limits on tactical nuclear weapons.

I would not change existing targeting guidance just for arms control purposes. Changes that make sense on their own merits are a different issue. I do not support targeting cities simply because it takes fewer nuclear weapons to destroy them than our existing targeting strategy. I believe targeting cities for the purpose of killing civilians is morally bankrupt and inconsistent with humanitarian international law.

Ms. SANCHEZ. What drives and constrains current Chinese and Russian nuclear weapons modernization efforts?

Dr. SCHNEIDER. Russia sees nuclear weapons as central to its security because of conventional weakness, the military effectiveness of nuclear weapons and it is the only basis for claiming that Russia is a great power. I am concerned that Russia views nuclear threats as a means of preventing NATO actions like Allied Force in Yugoslavia. It is clear that Putin would have reacted very differently to Libya. During his first presidency, Putin did not have nuclear superiority. He now has it. I am concerned about how he may use it.

The main constraining force on Russia is lack of an economy that can support Soviet style strategic forces. The main constraining force on China is inferior technology.

I believe that China sees nuclear weapons as part of its overall deterrence and warfighting capability. This is dangerous because of Chinese claims concerning Taiwan and China's declared willingness to pay "any price" to prevent Taiwanese "independence." This is the only international confrontation involving nuclear weapons where a nation claims sovereignty over the entire territory of another nation. The "one China" rhetoric aside, China does not control Taiwan and can only do so by military force or the threat of military force. China is increasing its military budget more each year than the entire Taiwanese military budget. U.S. arms sales policy toward Taiwan, particularly our unwillingness to sell the F–16, is making war more likely.

Ms. SANCHEZ. How much insight do we have into China's nuclear program and what can be done to increase Chinese transparency about its nuclear program?

Dr. SCHNEIDER. Not as much as we would like. China is very secretive and practices a great deal of deception.

The principal Chinese nuclear weapons organization, the Chinese Academy of Engineering's Institute of Physics, employs 8,500 professional technical staff members. Yu Min, described by *Xinhua* as the "architect of the country's first H-bomb," claims that China's key nuclear capabilities are "on a par with the United States and the former Soviet Union." Xue Bencheng, one of the most important scientists involved in the development of China's neutron bomb, stated that the July 1996 Chinese nuclear test was "a great spanning leap" because it solved the problem of nuclear weapons miniaturization.

According to Vyacheslav Baskakov and Aleksandr Gorshkov, Russian military journalists: "Specifically, it [China] will succeed in making the shift from its current

megaton-class nuclear ordinance to a level of hundreds and tens of kilotons, thereby increasing the effectiveness of available forces and weapons, flexibility of use in various circumstances and combat situations on both a strategic and tactical level. For example, it is believed that the yield of the strategic nuclear warheads with which Chinese ICBM's are now equipped will decrease from 1–4 megatons to 250–650 kilotons each. The yield of tactical and operational-tactical nuclear warheads, according to expert assessments, will total from 90–100 kilotons each."

There are convincing reports that this recent progress has not been entirely indigenous. "For example, the House Select Committee on U.S. National Security and Military Commercial Concerns with the People's Republic of China, generally known as the Cox Committee, concluded that: The People's Republic of China (PRC) has stolen classified information on all of the United States' most advanced thermonuclear warheads, and several of the associated reentry vehicles. These thefts are the result of an intelligence collection program spanning two decades, and continuing to the present. The PRC intelligence collection program included espionage, review of unclassified publications, and extensive interactions with scientists from the Department of Energy's national weapons laboratories."

A number of heavily redacted CIA intelligence reports on China's nuclear weapons testing have been declassified and made public. They include details that suggest a broad interest in developing nuclear weapons for tactical platforms, modernizing and replacing older warhead technologies. One of them states that, "A nuclear test at Lop Nor in 1990 may be related to development of a warhead for a Chinese short-range ballistic missile." The National Intelligence Daily (NID) in 1993 stated that accelerated Chinese testing expected by 1996 may also be related to "tactical systems to be developed in the future." In September 1995, the NID reported that, "China could be seeking to confirm the reliability of a nuclear artillery shell designed in advance of a nuclear test ban" in order to defend against Russian invasion or an amphibious landing. The device may have been a gun assembled uranium device. The Chinese nuclear tests in 1993 were driven "by its need to modernize its nuclear force, built largely using 1960 and 1970 technology." The NID in 1993 stated that China planned seven nuclear tests, including "testing for new SLBM and ICBMs warheads, by 1996 . . ." In June 1994, the NID assessed that China was developing new nuclear weapons that "may use more advanced concepts such as aspherical primaries and possibly a type of IHE [Insensitive High Explosive]." In 1995, the NID judged that Chinese testing was also aimed at developing "a cruise missile warhead and may involve safety upgrades to existing systems." A Chinese nuclear test planned for 1994 was aimed at "the completion of warhead development for new intercontinental and submarine launched ballistic missiles and the development of technologies to enhance confidence in warheads for an enduring stockpile under a nuclear test ban."

China will not voluntarily agree to transparency measures. Despite its propaganda efforts on nuclear weapons, it has avoided arms control and transparency. Only intense pressure on China has any chance to change this.

Ms. SANCHEZ. Has China ever sought parity with the U.S. and Russia? Why?

Dr. SCHNEIDER. During the Cold War, China did not have the economic or the technical capability to challenge the U.S. or Russia and made no effort to do so. Since the end of the Cold War, China has made a major effort to expand the quantity and quality of its nuclear forces. China can only approach current U.S. levels if it develops advanced delivery vehicles and nuclear warheads. To challenge us, China will need MIRV warheads. According to the most recent Pentagon report on Chinese military power, the PRC may be developing a new road-mobile ICBM, "possibly" capable of carrying a multiple independently targetable warhead (MIRV). This is apparently the missile that is referred to as the DF–41 in the Asian press. *Jane's* reports it may carry up to 9–10 warheads. There are reports in the Asian press that China plans to heavily MIRV its SLBMs—as many as 576 warheads on six submarines, although no time frame is reported. While the Pentagon report on China does not provide unclassified projections of future Chinese nuclear capability, the Republican Senators on the Foreign Relations Committee in the Committee report on New START estimated that the Chinese nuclear force would grow to 500–1,000 weapons in the next decade. In addition to strategic systems, China has a variety of medium and intermediate range ballistic missiles. *Aviation Week* reports that China has announced that its new 4,000-km range ballistic missile will be nuclear capable.

I believe we will see a gradual buildup of Chinese nuclear weapons over the next two decades with the ultimate objective of matching the U.S. in nuclear weapons as well as in all military capabilities. They have the economic capability to do this and our policy is making it easier.

Ms. SANCHEZ. What does China's no first-use and alert posture maintaining nuclear warheads separated from the delivery vehicles tell us about their nuclear policy? Does this matter?

Dr. SCHNEIDER. I do not believe China's "no first use" policy is real. A careful look at the Chinese wording of China's "no first use" policy reveals that it commits them to nothing. As former U.S. military attaché to China, Colonel (ret.) Larry Wortzel has pointed out, "The U.S. has already used nuclear weapons against Japan in August 1945 . . . [thus] if China launched a surprise nuclear attack tomorrow, it would still not be the first nation to use nuclear weapons." The Pentagon report on the Chinese military warns that "there is some ambiguity" over the conditions under which China's No First Use policy would apply, "including whether strikes on what China considers its own territory, demonstration strikes, or high altitude bursts would constitute a first use." I believe this is understated.

The Japanese *Kyodo News Agency* revealed that it obtained classified Chinese documents which say that China "will adjust the nuclear threat policy if a nuclear missile-possessing country carries out a series of air strikes against key strategic targets in our country with absolutely superior conventional weapons . . ." China's U.N. Arms Control Ambassador once said that "no first use" does not apply to Taiwan. Chinese nuclear doctrine has evolved toward "active defense," which has a nuclear warfighting component.

If "no first use" is really Chinese government policy, how does one explain the fact that over the last decade there have been repeated threats from the Chinese military of first use against the United States over the Taiwan issue? According to Andrei Chang, founder and editor of the *Kanwa Defense Review,* a Canada-based publication that specializes in following Chinese military developments reports that "after 1996 China has a number of times attempted to impose nuclear deterrence against the U.S. and Taiwan, both strategically and tactically." Perhaps the most famous recent such threat was made in 1996 by Lt. General Xion Guangkai, then a deputy chief of the General Staff. The general made an implied threat to destroy Los Angeles in the event of a conflict over Taiwan. He was also quoted as saying that to prevent Taiwanese independence, "China was prepared to sacrifice millions of people, even entire cities in a nuclear exchange."

Writing in 2000, academic Ellis Joffe noted that, "A Chinese military publication was more blunt. The United States, it said, will not sacrifice 200 million Americans for 20 million Taiwanese . . ." He added, "They will acknowledge it [the Chinese victory] and withdraw." Another Chinese military journal reportedly said that China had made preparations to "fight a nuclear war with the United States." In February 2000, then-Colonel Zhu Chenghu, then-Deputy Chief of the Strategic Research Institute of Chinese National Defense University, stated that, "China has the capability to launch a nuclear attack against the United States. If the United States tried to interfere in our dispute with Taiwan, it would suffer a powerful blow as a result." In July 2005, Zhu Chenghu, now a Major General and a Dean of the National Defense University, at a meeting for reporters sponsored by the Chinese Foreign Ministry, threatened the destruction of several hundred U.S. cities if the United States used conventional weapons against China in response to a Chinese attack on Taiwan. In an August 2007 interview with Chinese Major General Cai Yuqiu, Vice Principal of Nanjing Army Command College, published in *Ta Kung Pao,* an internet version of a PRC-owned daily newspaper, reported that, "Cai Yuqiu said that he really appreciated the four sentence fight principle by Mao Zedong, i.e., we will not attack unless we are attacked; if we are attacked, we will certainly counter-attack. As to whether we will use nuclear weapons first, the above principle can also be followed. If we have been repeatedly 'attacked,' then there should not be a limit for our counter-attack."

When China announced its "no first use doctrine" in 1964, it simultaneously faced tens-of-thousands of nuclear weapons (with little hope of reducing the disparity to even one hundred-to-one within the foreseeable future) and movement toward a crisis relationship with the Soviet Union. The situation is completely different today. Writing in January 2005, Colonel Wen Shang-hsien of the Taiwanese military reported that after the year 2000 the PRC adopted a nuclear doctrine that allowed for a "a preemptive strike strategy," under which the PRC would use "its tactical nuclear weapons in regional wars if necessary."

Ms. SANCHEZ. How does the development of a Russian mobile heavy mobile ICBM affect strategic stability and our deterrent? And what role might U.S. policy and posture play in Russia's decision to develop a heavy ICBM with MIRV capability?

Dr. SCHNEIDER. Russia is developing a new heavy ICBM which the Russian press says will carry 10 heavy or15 medium sized nuclear warheads. It is not a mobile ICBM but rather will be based in substantially upgraded silos, protected by active defenses and GPS jamming, according to Russian press reports.

Russia is developing the new heavy ICBM for the same reasons it did in the Cold War. The obvious target of the missile is the U.S. ICBM force. Russia's upgraded ICBM silos will be more survivable than existing Russian ICBM silos. However, the silos will be unlikely to be as survivable as the new Russian SS–27 mobile ICBMs. It a very important piece of evidence that Russia is planning for a nuclear warfighting capability against the U.S.

Ms. SANCHEZ. Do you believe Russia will seek to build back up to New START levels if the number of their nuclear warheads and delivery vehicles fall below New START levels in the next few years?

Dr. SCHNEIDER. Russia was below the New START deployed warhead and delivery vehicle limits on the day New START entered into force, according to Russia's first New START data declaration. During the New START Treaty's ratification, Russian defense minister Anatoliy Serdyukov stated three times that Russia was already below the New START limits on both deployed nuclear warheads and delivery vehicles and intended to build up to them. He said: "We will meet every parameter established by the treaty before 2028, while the warhead limits will be met by 2018." Russia's first New START data update declaration, published by the State Department in October 2011, said that they have moved from below the New START warhead limits to above them, an overall increase of 29 warheads.

I believe Russia will make every effort to keep the number of its nuclear warheads as high as possible. I do not believe Russian forces will ever decline to 1,550 operationally deployed strategic nuclear weapons as they were counted in the Moscow Treaty of 2002. Even *ITAR–TASS* admits that they can stay several hundred weapons above the New START limit because of the bomber weapons counting rule which counts a bomber as carrying only one warhead.

Ms. SANCHEZ. Should U.S. modernization of its nuclear weapons be tied to Russian or Chinese modernization? Why/why not? How does the effectiveness of Russia and China's nuclear deterrent compare to ours? And given what we know of the different models for maintaining nuclear weapons, would you trade our nuclear weapons for China's or Russia's?

Mr. FISHER. Inasmuch as both Russia and China have opted to deploy heavy mobile ICBMs to increase their survivability, I believe it is necessary for the United States to increase the survivability of its land based ICBM force beyond reliance on hardened silos. Given the near certainty that China and Russia are going to deploy new heavy ICBMs with multiple warheads, it is imperative for the United States to develop a similar new heavy, mobile ICBM. I would not trade U.S. weapons for those of China or Russia but I do believe that the U.S. can develop and should develop a superior heavy mobile ICBM with adequate local active protection systems.

Ms. SANCHEZ. What role, benefits and risks are there for further nuclear arms control measures given Russian and Chinese nuclear weapons modernization efforts and plans?

Mr. FISHER. Any further U.S. reductions in its nuclear arsenal would be most unwise without a verifiable understanding of China's current nuclear order of battle, its plans for nuclear modernization, its real nuclear doctrine, its plans for missile defenses and its plans for outer space warfare.

Ms. SANCHEZ. What impact would the Comprehensive Test Ban Treaty (CTBT) have on stemming nuclear weapons modernization, particularly for China? And what are Russia and China's positions on the CTBT?

Mr. FISHER. It is my assessment that for any Chinese adherence to a CTBT to be credible that the U.S. would have to insist on access to known and future discovered Chinese nuclear testing facilities. But as I believe that such access will not be granted by China, I therefore have little confidence that a CTBT would inhibit China's nuclear modernization.

Ms. SANCHEZ. Understanding the Chinese and Russian current and planned modernization efforts, should the U.S. change its current nuclear posture and policy, including numbers and targeting? Why, why not?

Mr. FISHER. Given what I know about China's potential nuclear modernization plans, its potential plans for missile defenses and for outer space warfare, I would suggest the following: 1) There be no further reductions in U.S. nuclear warhead numbers, SSBN deployment rates or targeting policies; 2) The U.S. should have the ability to increase its warhead numbers very quickly if China's nuclear warhead count exceeds 300; 3) The U.S. should develop a new heavy mobile MIRV ICBM with active point defenses like rail guns to increase their survivability; 4) The U.S. should develop a new SSBN to succeed the Ohio class; 5) The U.S. should develop active military space combat capabilities to deter China's use of similar capabilities that it is developing.

Ms. SANCHEZ. What drives and constrains current Chinese and Russian nuclear weapons modernization efforts?

Mr. FISHER. China's nuclear modernization and buildup is driven by its desire to become the preeminent global military power during this century. This ambition is constrained by the amount of resources that China can devote to this goal without increasing domestic stability threats to the continuation of the Communist Party dictatorship.

Ms. SANCHEZ. How much insight do we have into China's nuclear program and what can be done to increase Chinese transparency about its nuclear program?

Mr. FISHER. The United States, as well as the rest of the World, has a fundamentally insufficient understanding of China's nuclear weapons program, both for the purposes of pursuing a path to strategic stability with China, and in comparison to the transparency permitted by the United States and Russia. Furthermore, we do not have sufficient understanding regarding China's direct and indirect roles in assisting the nuclear weapons capabilities of North Korea, Pakistan, Iran and China's possible understanding and/or relationship to proxies of these countries, like Hezbollah, that could be used to deliver rogue-state nuclear weapons. Until China decides that far greater transparency about its own nuclear program, or about those nuclear programs that is has assisted, is in its national security interest, very little can be done save to redouble U.S. espionage and intelligence operations targeting China's nuclear weapons sector.

Ms. SANCHEZ. Has China ever sought parity with the U.S. and Russia? Why?

Mr. FISHER. China is waiting for the right time to seek nuclear superiority over the United States. China is well on its way to achieving superiority in conventional weapons over the United States in the Asia-Pacific region. The numbers of aircraft carriers, amphibious projection ships, combat aircraft, and large transport aircraft that I estimate that China is seeking by the 2020s, would require a massive shift in U.S. forces to deter a potential conflict—given a likely continuation of global U.S. military commitments. In nuclear weapons, China does not have to achieve "parity" in order to upend the nuclear balance. A PLA force of 500 defended nuclear warheads would deeply undermine Asian allied confidence in the extended U.S. nuclear deterrent.

Ms. SANCHEZ. What does China's no first-use and alert posture maintaining nuclear warheads separated from the delivery vehicles tell us about their nuclear policy? Does this matter?

Mr. FISHER. It is not clear to me that modern tube-launched and stored ICBMs and SLBMs are deployed *without* their nuclear warheads. Constantly unlocking complex seals on these large tubes, needed to sustain "cold launch" gas pressures, augers against China keeping its warheads "de-mated" from their DF–21, DF–31, DF–31A and future "DF–41" ICBMs. This is also, of course, impossible to sustain for SLBMs at sea. Keeping these newer mobile ICBMs deployed with warheads also reduces their response time, both for offensive and defensive contingencies. Unless this Committee has access to information that the PLA does "de-mate" all of its modern solid fueled tube-launched nuclear missiles, then I would advise that the U.S. not credit China with a "relaxed" nuclear posture suggested by this question.

Ms. SANCHEZ. How does the development of a Russian mobile heavy mobile ICBM affect strategic stability and our deterrent? And what role might U.S. policy and posture play in Russia's decision to develop a heavy ICBM with MIRV capability?

Mr. FISHER. I am much more concerned about China's development of a new large mobile ICBM that most likely will be MIRV equipped. Given China's willingness to release limited imagery regarding this new missile, I also find it very unfortunate that the U.S. government has not revealed more data concerning this missile. The development of this missile could have far more profound effect on U.S. nuclear deterrent requirements because China's far greater effort to remain untransparent about this program. I would urge this Committee to in turn urge the Administration to provide the American people with a far more complete warning about this new missile, to the degree that source protection permits. As previously stated, I believe the advent of new Russian and Chinese large mobile MIRVed ICBMs places great pressure on the U.S. to develop its own new modern mobile ICBM that can also be paired with active defenses.

Ms. SANCHEZ. Do you believe Russia will seek to build back up to New START levels if the number of their nuclear warheads and delivery vehicles fall below New START levels in the next few years?

Mr. FISHER. I do not have a sufficient understanding of Russia's nuclear plans to give a useful answer.

Ms. SANCHEZ. Should U.S. modernization of its nuclear weapons be tied to Russian or Chinese modernization? Why/why not? How does the effectiveness of Russia and China's nuclear deterrent compare to ours? And given what we know of the different models for maintaining nuclear weapons, would you trade our nuclear weapons for China's or Russia's? [Question #15, for cross-reference—ed.]

Dr. LEWIS. The overall balance of deterrence is not sensitive, in my judgment, to the technical details of opposing nuclear forces—particularly not at current levels in excess of 1,000 deployed nuclear warheads, many of which are deployed on submarines that are virtually invulnerable today.

The United States should seek to maintain a secure and credible option to respond to a nuclear attack against the United States, our forces abroad and our allies and partners. Beyond a basic requirement that forces be survivable in large enough numbers to hold at risk those targets judged necessary for deterrence, small technical advantages in nuclear forces confer no political or strategic advantage. Most measures relating to nuclear weapons policy, forces and posture are about reassuring ourselves that we have done enough as good stewards of our strategic forces. These measures have little or no impact on calculations in Moscow or Beijing.

Although the overall balance among all three forces is very robust, I would not trade nuclear forces with any other country. Russian leaders appear deeply concerned about the survivability of their nuclear forces, a situation that I believe no U.S. President could accept. Chinese leaders appear willing to accept levels of numerical inferiority that would compromise current approaches to extending deterrence to U.S. allies and partners. Moreover, the United States retains a more agile and capable industrial base than either country. [Answer to question #15, for cross-reference—ed.]

Ms. SANCHEZ. What role, benefits and risks are there for further nuclear arms control measures given Russian and Chinese nuclear weapons modernization efforts and plans?

Dr. LEWIS. During the Cold War, a bipartisan consensus existed on the need to drive the Soviet Union toward a more stabilizing nuclear weapons posture that did not rely heavily on early use to maintain survivability. Today, we lack a consensus about why further arms control measures are necessary beyond a reasonable assumption that the collapse of this process, along with its verification and transparency measures, would undermine strategic stability and U.S. security.

Russian leaders, as I noted in my testimony, are deeply concerned about their ability to command their nuclear forces during a crisis and fear a "decapitating" first strike by the United States. The United States should place particular emphasis on measures that reduce Russian fears about the viability of their command and control structure. Long-standing efforts by the Clinton, Bush and now Obama Administrations to establish the Joint Data Exchange Center (now Joint Data Fusion Center) to share early warning data with Moscow is one example of a measure that might contribute to stability. The United States might also negotiate an agreement with Moscow to not place nuclear weapons on missile defense interceptors. (The FY2003 National Defense Authorization Act prohibits the expenditure of any funds on the research, testing or development of nuclear-armed missile defenses.)

China is currently in the process of adding new solid-fueled ballistic missiles to its strategic forces. In a serious crisis, according to some training materials for Chinese officers, they intend to place these forces on alert to signal their resolve. As new mobile missiles have become available, this may mean sending road-mobile missiles out into the field and flushing ballistic missile submarines (which are not yet armed with operational ballistic missiles) into the ocean. The United States and China need urgently to begin strategic stability consultations now, rather than during a serious political or military crisis.

Ms. SANCHEZ. What impact would the Comprehensive Test Ban Treaty (CTBT) have on stemming nuclear weapons modernization, particularly for China? And what are Russia and China's positions on the CTBT?

Dr. LEWIS. If China were to ratify and observe the terms of the CTBT, China would probably be unable to develop new nuclear warhead designs small enough to permit placement of multiple warheads on China's new solid-fueled ballistic missiles. This would constrain the size of China's strategic forces, greatly reducing the potential threat to the U.S. and its allies in the region.

Russia has ratified the CTBT. Russia maintains that it is complying with the CTBT, conducting only so-called subcritical nuclear tests at Novaya Zemlya, similar to those conducted by the United States at the Nevada Test site.

Chinese officials privately indicate that they will ratify the CTBT after the United States does. Chinese officials do not publicly describe stockpile stewardship activities, but almost certainly are conducting subcritical tests at the Lop Nor test site.

The United States would likely be able to detect tests above a few hundred tons at either the Novaya Zemlya or Lop Nor test sites, ruling out most nuclear tests. The current test moratorium "locks in" the current Russian practice of remanufacturing nuclear weapons as a basis stockpile stewardship measure and significantly constrains the ability of both Russia and China to modernize their existing nuclear weapons designs.

Ms. SANCHEZ. Understanding the Chinese and Russian current and planned modernization efforts, should the U.S. change its current nuclear posture and policy, including numbers and targeting? Why, why not?

Dr. LEWIS. Today, nuclear weapons play a smaller role in U.S. and allied security than at any time since the end of the Second World War. Our challenge is to align our nuclear weapons policies, forces and posture with this limited role. Neither Russia nor China are modernizing their forces in a way that could, at this time, threaten what is an extraordinarily robust balance of terror.

The overall balance of deterrence is sufficiently strong that the United States could further reduce the number of nuclear weapons, further relax certain readiness requirements, and further "scrub" existing target sets with no risk to national security. The United States should consider such changes to the extent that they may yield cost savings in the current budgetary environment or enhance strategic stability.

Ms. SANCHEZ. What drives and constrains current Chinese and Russian nuclear weapons modernization efforts?

Dr. LEWIS. Russian leaders continue to value maintaining a relatively large nuclear arsenal, both as a deterrent against the United States and a hedge against the growing military capability of China. Russian leaders also appear acutely concerned about the vulnerability of their forces, particularly their ability to command those forces in a crisis.

China is continuing on the modernization path established in the mid-1980s, replacing existing liquid-fueled ballistic missiles with solid-fueled ballistic missiles. China may also modestly expand the total number of warheads capable of reaching the United States, although large increases in nuclear forces do not appear underway. (At the same time, China is rapidly increasing the number of conventionally-armed ballistic and cruise missiles.) China is not currently developing new nuclear warhead designs. China's modernization appears driven by a national commitment to acquire the same types of capabilities, albeit in smaller numbers, as those possessed by the United States and Russia.

Ms. SANCHEZ. In your opinion, what can China or Russia gain by performing sub-kiloton testing? How would this impact their modernization efforts? How would these tests, especially by Russia, impact U.S. deterrent capability?

Dr. LEWIS. I know of no evidence that either Russia or China are conducting so-called hydronuclear tests (which produce a small nuclear yield and would be prohibited under the Comprehensive Nuclear Test Ban Treaty) as opposed to sub-critical tests similar to those conducted by the United States (which do not produce a nuclear yield and would not be prohibited under the CTBT).

Neither Russia nor China would be able to develop new thermonuclear warhead designs of yields above 1–2 kilotons with only sub-kiloton testing. China, in particular, would face difficulty in developing warheads that would allow it to place multiple warheads on a mobile missiles.

Overall, clandestine sub-kiloton testing would pose little threat to the overall deterrent balance—although the United States should not ignore evidence of willfull treaty violations if they should occur. On the other hand, the United States should be careful not to make hasty accusations that later turn out to be false. For example, the Clinton Administration demarched Russia for conducting a clandestine nuclear test in August 1997 that later turned out to be an earthquake.

The United States should seek additional test-site transparency measures, principally with Russia, as part of a concerted effort to secure ratification in the United States Senate and bring the CTBT into force.

Ms. SANCHEZ. How much insight do we have into China's nuclear program and what can be done to increase Chinese transparency about its nuclear program?

Dr. LEWIS. The United States intelligence community appears to have reasonably detailed information about Chinese fissile material production, ballistic and cruise missile development and force structure (bases, brigades, etc.). Declassified U.S. intelligence estimates that China maintains a total stockpile of approximately 200–300 nuclear weapons deployed on ballistic missiles are almost certainly accurate to within an order of magnitude. China has hundreds, not thousands, of nuclear weapons.

Moreover, the growing openness of Chinese society has led to an explosion of information that can assist in tracking the evolution of Chinese strategic forces. Today, the greatest challenge is in sorting the enormous "noise" produced by the a cacophony of Chinese bloggers, hyper-patriots, military buffs and so on who often recycle inaccurate or distorted Western information as their own analysis.

Recent reports that China has more than 3,000 nuclear weapons, which appear to be based largely on an anonymous internet posting, demonstrate the potential pitfalls in this new era of transparency.

An important goal of strategic stability consultations should be specific measures to enhance transparency relating to China's force structure and modernization programs.

Ms. SANCHEZ. Has China ever sought parity with the U.S. and Russia? Why?

Dr. LEWIS. No, Chinese leaders have never sought numerical parity in nuclear weapons or delivery vehicles with either U.S. or Russian strategic forces.

Chinese leaders view technological milestones, not force levels, as the important feature in the nuclear balance, which they regard as extraordinarily robust. Chinese leaders would prefer, for example, to have a smaller number of modern missiles and warheads than an equivalent number of inferior strategic forces.

This reflects a "possession" mentality where Chinese leaders view seek the same capabilities as other nuclear-weapons states, even if they chose to deploy only small numbers or, in the case of enhanced radiation warheads, none at all. Similarly, this emphasis on matching the capabilities of other powers is evident in Chinese efforts to develop a "hit-to-kill" system similar to the U.S. missile defense programs.

Ms. SANCHEZ. What does China's no first-use and alert posture maintaining nuclear warheads separated from the delivery vehicles tell us about their nuclear policy? Does this matter?

Dr. LEWIS. China maintains a very unusual nuclear posture—it maintains a small nuclear force based largely on land-based ballistic missiles kept off alert and with the most restrictive employment guidance (a "no first use" policy). Chinese military textbooks and exercises suggest that Chinese leaders plan to "ride out" a nuclear attack before ordering a retaliatory strike.

There are bureaucratic, historical and cultural reasons for this unusual decision. The simplest explanation is that, unlike Western policymakers, Chinese leaders believe deterrence is not difficult to achieve or maintain. As a result, Chinese leaders have endured a level of vulnerability that neither Washington nor Moscow would accept.

Many American analysts have difficulty accepting that China would willingly choose such a deterrent. They deny that Chinese leaders really have a "no first use" policy or argue that there must be thousands more nuclear weapons hidden somewhere. In fact, Chinese leaders simply think differently about nuclear weapons than their American counterparts.

Radically different Chinese and American views about nuclear weapons complicate strategic dialogue between officials from the two countries and, in a crisis, might undermine strategic stability by reinforcing mutual suspicions. Although leaders from both countries generally acknowledge the need for strategic dialogue and have attempted to establish various fora, the overall level of communication and understanding between the two remains dangerously inadequate.

Ms. SANCHEZ. How does the development of a Russian mobile heavy mobile ICBM affect strategic stability and our deterrent? And what role might U.S. policy and posture play in Russia's decision to develop a heavy ICBM with MIRV capability?

Dr. LEWIS. See Question 15 [answer at top of page 104].

Ms. SANCHEZ. Do you believe Russia will seek to build back up to New START levels if the number of their nuclear warheads and delivery vehicles fall below New START levels in the next few years?

Dr. LEWIS. Russia will be able to maintain the full number of treaty-permitted delivery vehicles under the New START Treaty, unless it retains large numbers of obsolete and vulnerable systems. A reasonable projection for modern delivery vehicles in the coming years is approximately 500.

Russia will, on the other hand, attempt to maintain the full 1550 deployed nuclear warheads. Russia's decision to continue the extensive use of multiple warheads on ballistic missiles may undermine strategic stability.

As a result, the New START Treaty made important progress in driving Russia toward a more stabilizing force posture, but additional agreements would be necessary to further reduce the dangers to the United States. In particular, the United States should seek to resurrect the ban on multiple warheads for land-based ballistic missiles that was lost with the START II Treaty, even at the cost of further reductions in the number of treaty-accountable delivery vehicles.

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