The Need for Speed?
Debating Conventional Prompt Global Strike

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Moderator:
George Perkovich,
Vice President for Studies and Director of the Nuclear Policy Program,
Carnegie Endowment for International Peace

Speakers:
James Acton,
Senior Associate,
Carnegie Nuclear Policy Program

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GEORGE PERKOVICH: Good afternoon. My name's George Perkovich. I'm vice president for studies here at the Carnegie Endowment. It's my pleasure to welcome you all back to school after summer, first Tuesday after Labor Day. It's a tribute to the topic, I guess, and to James' scholarship that so many of you have turned out on the first day back into the – into the new year.

It gives me a special pleasure to introduce James and to moderate the discussion that’ll follow after his presentation because I think this report – it's really a book – which is available outside, but “Silver Bullet” is a model of scholarship and careful analysis. And when you read it, I think you’ll find that it’s by far the most exhaustive public treatment of the topic, which is basically – goes beyond the label of conventional prompt global strike, but looking at possible conventional capabilities that the U.S. could consider developing and analyzing these from a technical perspective, from a functional perspective, looking at tradeoffs in a way that’s much more detailed and careful than exists in the public domain.

And what I especially admire about it and what I think you will too when you read it too is that James is looking at it in kind of an open-minded way, so he’s not making an argument for or against the concept or particular applications but actually looking at the different options that have been proposed and then kind of describing what would technically be required and what technology does exist and what the trade-offs might be so that you’re left, when you – when you finish, I think being exposed to a very careful and rigorous analysis, which probably won’t lead you to a clear conclusion what you think one way or the other but will give you a sense of the very important trade-offs involved, the additional information that would be necessary to make a sound decision. And to my mind, that’s what excellent analysts should do for you, those – or the kinds of tours on which they should take you through a topic. And so it’s with great pride that I personally at the – and that the institution is associated with this report. It really is an excellent piece of work.

I will not delay us longer from James and his presentation of the basic outlines of the report. I should say James is a senior associate here at Carnegie. He brings a – not unique in the sense that he has predecessors throughout in strategic affairs who have a scientific background – he’s a physicist from Cambridge University, so he has a scientific, technical background and capacity, but then for the last number of years has been working on arms control and strategic issues, so that
blend of technical capability, kind of historical analysis and strategic understanding I think also helps inform this report in ways that are very important.

So James, let me turn it over to you, and then we’ll have a discussion. Thanks.

JAMES ACTON: Well, thank you, George. There’s a huge number of people who I should thank for help with the report, and I’m certainly not going to list everybody now. The three organizations that I would just like to single out for thanks are the three organizations that contributed funding to this report. And so my genuine thanks to the John D. and Catherine T. MacArthur Foundation, who provided primary support for this project, and also the William and Flora Hewlett Foundation and the Carnegie Corporation of New York.

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Let me start – I’m going to try and talk for about 14 minutes or so, and then I very much look forward to having a conversation with you. Let me start by talking about why now is now the right time to be discussing conventional prompt global strike.

And it’s in fact an anniversary this year. It’s 10 years since the U.S. military issued a so-called mission need statement. That is a statement which identified the need for a new capability – in this case, high precision conventional weapons capable of striking targets around the globe within, quote, minutes or hours. And ever since that mission need statement was issued, this has been a formal part of U.S. policy to acquire these capabilities.

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We had a national debate – I say “we” had a national debate; I wasn’t living in the United States in the mid-2000s when this national debate took place. But in the mid-2000s there was a national debate about conventional prompt global strike. And that was triggered by the decision of the Bush administration to seek funding from Congress to take nuclear warhead off Trident missiles, which are the sea-based leg of the U.S. deterrent, and to replace those warheads with conventional weapons.

And that sparked a very lively, quite high-level, actually, national debate, where a number of congressmen and –women took parts in this debate. And back then the crux of the issue was something called warhead ambiguity. The concern was that Russia or possibly China in the future would see the launch of one of these weapons and mistake it for a nuclear weapon and launch a nuclear response.
Now, since the mid-2000s a tremendous amount has changed. There has been now almost a decade of research and development into very different technologies from those that were the – considered by the Bush administration back in 2006, 2007. The focus of threat perceptions for military planners within the U.S. has changed. The mid-2000s, shortly after the September 11th attacks, terrorism was perhaps the primary focus. Today the U.S.’s threat perception is moving back to state-sponsored threat, Chinese anti-access aerial denial capabilities, the spread of nuclear weapons, the spread of anti-satellite weapons. The fiscal environment has also changed drastically since the mid-2000s. Many of these new technologies that are being discussed are much more expensive than the conventional Trident system was, and it’s coming at a time of severe downward pressure on the defense budget.

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So for all of those reasons – changes in technology, changes in the fiscal environment, changes in the nature of the threat – and, most importantly, because the Obama administration has indicated that it wishes to actually move from research and development to acquisition – that is, to actually buy one of these systems in the not-too-distant future – it seems to me that it’s worth examining the whole concept of conventional prompt global strike.

Now, let me tell you to start with what this report is not. And this something that George has already mentioned. This report is not an argument for or against acquiring conventional prompt global strike. It’s not an argument against or for any particular conventional prompt global strike system.

What it does aim to do is to raise a series of issues that I think haven’t considered – haven’t had adequate consideration. And almost all of the recommendations it makes are process-oriented. That is to say, it’s about making suggestions about how the U.S. can get this decision right.

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And let me start by pointing out what the national academies said in the report that was mandated by Congress back in 2008. The national academies actually endorsed the idea of the conventional Trident modification. But what it said is that any longer-term, more versatile option would be a far more expensive national investment that the committee believes must be put into the broader context of the nation’s strategic strike policy and national security strategy, end quote. All of those systems that we’re considering today are exactly those more expensive, longer-term, more versatile potions. And what I think is missing from the debate about conventional prompt global strike is the big picture of the nation’s strategic strike policy and national security strategy.
And so what I want to do today is just highlight four key issues that I think are missing from the debate: Firstly, a lack of clarity about the role for these weapons; secondly, a lack of discussion about the military benefits and weaknesses of conventional prompt global strike systems versus the nonprompt alternatives; thirdly, a lack of attention that’s being paid to enabling capabilities – that’s the stuff that actually makes the weapons work – and fourthly, the full range of international ramifications.

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Before I do that, let me – let me comment very briefly on the technology. The goal of conventional prompt global strike is usually described as developing high-precision conventional weapons capable of reaching a target anywhere in the world within one hour. That description, while it’s often repeated, is an increasingly inaccurate description of the technology under development. In the most recent budget request by the president, funding for the one global range system that was under development was very, very heavily reduced. And the focus of the program is now on regional systems or intercontinental systems but certainly not global systems.

In fact, there’s three basic technologies. And, you know, you can – you can find a lot more about the technology in the systems in the report, but let me just highlight the three basic technological approaches.

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First is you can take a ballistic missile, replace the – or developing new one, stick a conventional warhead on top, and this thing goes through a standard ballistic trajectory, up into space, back down again. And at the very, very end of its flight, when it re-enters the atmosphere, you can add a pair of flaps onto the re-entry vehicle that can steer it onto its target.

Second option, which is the current favored option by the Pentagon, are so-called boost-glide systems. These are hypersonic gliders, a bit like super-evolved paper airplanes, if you like, that are capable of gliding 20 times the speed of sound in the upper atmosphere. And these would be launched into the upper atmosphere by rockets and then glide for potentially thousands of kilometers purely under their own steam.

And the third option are hypersonic cruise missiles. These are a bit like normal cruise missiles. They kind of – they have aerodynamic lift. They’re powered throughout their flight. But they’re just a lot of faster. This is actually a bureaucratically separate effort from conventional prompt global strike. It’s a different funding stream. It’s different people. But it’s a similar goal.
Finally, I'm not going to talk about this today, but I just flag it up in the report, that Russia and China are both very interested in these technologies for themselves and are developing them as well.

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So firstly, of the four big points I want to make today, firstly, there is a lack of clarity about the possible roles for conventional prompt global strike. There are, in fact, four different ideas that have been publicly floated by U.S. officials about what this technology could be used for. First is the counternuclear mission. This is essentially denying a new proliferator, not Russia or China, a new proliferator the ability to use its nuclear arsenal going after other countries’ nuclear weapons. Secondly, countering anti-satellite capabilities. And this is a mission that is maybe not exclusively but very largely focused on China. Thirdly, defense suppression. That is, countering advanced defensive systems, generally known as anti-access aerial denial capabilities. And this mission is mostly about China but by no means exclusively about China. And finally, the counterterrorism mission.

The Pentagon has not yet made any doctrinal decision about what these weapons would be used for. And this is a problem in my mind because all of these different missions have quite different requirements. One weapon can’t necessarily service all of these different missions.

One distinction that hasn’t been made that I think is critical is the difference between promptness and surprise. Promptness is getting a weapon from me to the target very quickly. Surprise is the target not knowing that the weapon is on the way until it’s too late to do anything about it. And surprise is neither a necessary or a sufficient condition for promptness. Let me explain that a bit more.

A stealthy weapon could take hours to get to the target but it could surprise an adversary. A fast weapon, even if it moves very quickly and just takes an hour to cross a long distance, if an adversary can detect on launch that actually might not be good enough for surprise.

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So promptness and surprise are two conceptually separate attributes and this distinction between them hasn’t been made. And this distinction is important. Let’s say that the United States becomes worried that China is about to preemptively attack U.S. satellites. In that scenario surprise would be critical.
So the U.S. decides that China is about to start attacking U.S. satellites and the U.S. wants to preemptively take out Chinese anti-satellite capabilities. In that scenario, surprise would be critical. If China decided that — you know, if China knew that U.S. weapons were on the way it might use those anti-satellite capabilities before the U.S. could knock them out, so surprise would be critical.

Promptness I think would not be so critical. Any time the U.S. could ever imagine attacking China would only have been after a prolonged crisis lasting days or — much, much more likely — weeks or months. So whether or not weapons took one hour to reach their target or eight hours to reach their target wouldn’t be so important.

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Now, you know, as a counterpoint, consider that North Korea has used nuclear weapons and the U.S. wants to stop North Korea from using any more. You know, promptness would be critical in that scenario. Reducing the time that the U.S. weapons took to arrive from eight hours to one hour could save a lot of lives. But North Korea would surely be expecting an immediate U.S. response so it would be very, very hard to get surprise in that circumstance.

Also, the defenses would be different in those circumstances. China would have incredibly strong defenses that might be difficult to penetrate. North Korean defenses would be much softer. The ranges of weapons required would be much longer in China than North Korea.

So for these reasons, you know, these distinctions between missions tend to be lost when officials and analysts talk about, in very abstract terms, using Conventional Prompt Global Strike to threaten high-value, highly defended, distant, fleeting targets. Different missions have different requirements and that’s the place where a strategic acquisition process should start from.

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And so the kind of recommendations that flow from this are that the Department of Defense, if it’s not already doing so, should adopt a scenario-based approach to Conventional Prompt Global Strike acquisitions. And there were senior officials in the Bush administration who actively said, you know, we are thinking about this in abstract capabilities terms. We don’t think it’s helpful to think about specific scenarios. I mean, I think Congress should continue to push the administration on articulating what the military rationale for these weapons are.

The second point that I want to make is different Conventional Prompt Global Strike weapons are not all an equally good way of achieving the same military ends. They all have
distinctive strengths and distinctive weaknesses, and which weapon is best in some sense depends on the scenario. Let me make this a bit more concrete for you.

One of the challenges – one of the reasons why the U.S. is interested in Conventional Prompt Global Strike is to defeat advanced defenses such as air and missile – air and missile defenses. There’s also GPS denial, where an adversary tries to stop the weapons receiving GPS signals. That’s something I discussed in the report but I’m not going to discuss today.

Now, one thing U.S. adversaries might try to do is the very important high-value targets that CPGS might be used to threaten might be protected with advanced air and missile defenses. Trying to defend large areas with air and missile defenses is going to be very, very hard. Trying to defend localized high-value targets is more plausible.

Now, although CPGS weapons travel fast, they don’t necessarily travel fast enough to make life for point defenses very hard. As early as 1998 the National Academies was – sorry, 1998 the National Academies were saying that hypersonic cruise missiles will potentially be vulnerable to point defenses. Boost-glide systems, these hypersonic gliders that I’ve been talking about, they start at extremely high velocities, you know, 20 times the speed of sound, but after traveling through the atmosphere at – you know, for thousands of kilometers, they slow down. And typically they might arrive at their target at the speed of the medium-range ballistic missile.

Now, point defenses against medium-range ballistic missiles are not easy, but they’re not unimaginably difficult either, and especially over the time scale that we have to think about here with CPGS procurement, 20 or 30 years, point defenses against that kind of speed is not so daunting.

By contrast, you know, intermediate range ballistic missiles would probably be the most survivable against advanced defenses. However, these kinds of weapons are vulnerable to other countermeasures. You know, I’ve mentioned some missions for Conventional Prompt Global Strike require surprise. Well, one way an adversary can try and mitigate surprise is via early warning radars that, you know, for instance, Russia and China have.

Ballistic missiles are particularly easy to detect with early warning radars, whereas boost-glide weapons are much harder to detect early with early warning radars. So depending on which countermeasures potential adversaries adopt, some Conventional Prompt Global Strike systems are
best against some countermeasures and could be ineffective against others. But the weapons that are best in one scenario can be weakest in another scenario.

We don’t, however, just need to compare different weapons – Conventional Prompt Global Strike weapons against one another. We also need to compare them against non-prompt alternatives. And the key non-prompt alternative is often stealth technology. Stealth is potentially a good way of evading advanced early warning systems, of penetrating advanced air defenses.

Now, I certainly don’t have the clearances to know or to be able to make even an educated guess about whether, over the next 20 or 30 years, stealth or speed will be the best way of penetrating advanced defenses. But I do think that this is a critical issue that needs to be taken into account in internal analyses.

You know, at a time when there was a lot more money available, I think it was more tenable to say that all different military options, all different alternative ways of solving the same problem should be investigated. At a time of fiscal austerity I think it’s necessary to prioritize the option that carries the least risk of failing to fulfill military goals.

None of these options have no risk. The question is comparing risk. And so one thing that I suggest that the Department of Defense do is analyze the relative effectiveness of Conventional Prompt Global Strike and non-prompt alternative for these missions. The effective countermeasure is a crucial part of this analysis, as are weapon costs. You know, if non-prompt weapons are a lot less expensive than prompt weapons, you can bring a lot more non-prompt weapons to bear against any particular target.

The third issue I want to talk about today is enabling capabilities. Enabling capabilities are what make weapons systems work. These include intelligence, surveillance, reconnaissance for locating targets; command and control for authorizing a strike; and battle damage assessment for assessing whether or not weapons have actually had the desired effect on the target.

From the point of view of enabling capabilities, perhaps the single most challenging target out there are mobile targets like mobile missiles. Many potential targets for Conventional Prompt Global Strike are mobile. Almost all of nuclear-armed ballistic missiles, the potential targets for Conventional Prompt Global Strike, can move. They’re mobile. China’s anti-ship ballistic missiles
are mobile. Some of China’s anti-satellite weapons are mobile. Terrorists obviously are also mobile, but they’re not missiles and there’s different issues associated with them.

Now, it’s no coincidence that potential U.S. adversaries are investing very heavily in mobile capabilities, precisely because they’re extremely hard to kill. The United States famously discovered this in the 1991 Gulf War against Iraq when the U.S. did something called “the great Scud hunt,” attempting to hunt down Iraqi mobile Scuds. In 1,460 sorties against mobile Scud-related targets, the United States achieved a grand total of zero confirmed kills. And that’s how difficult these targets are.

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Now, U.S. capabilities to attack mobile missiles have improved immeasurably since that – or very significantly, let’s say. And today the most defective means that the U.S. would have of tracking mobile missiles – locating and tracking them – would be through aircraft, manned and unmanned, operating from within the theater. JSTARS, the radar-based airplanes, are a good example of this. UAVs may very well play a role in this.

But it doesn’t make much sense to use aircraft operating from within the theater to provide targeting information for very long-range weapons, because if aircraft can survive in the theater, you know, if they can beat whatever air defenses there are, why not just outfit those aircraft with missiles, because then they would be a lot closer to where the targets were, so they would actually be more effective at hunting down mobile targets, and it would be a lot cheaper than developing Conventional Prompt Global Strike.

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So the existing U.S. surveillance capabilities for hunting down mobile targets are not really very suitable for targeting data for Conventional Prompt Global Strike. The surveillance system that would make a lot of sense for Conventional Prompt Global Strike would be space-based radar. If aircraft could not survive in the theater because they were being shot down, and the U.S. had a globe-spanning array of space-based radars that were capable of locating mobile targets from a distance, that would make a lot of sense.

Now, the U.S. has some space-based radars at the moment but not nearly enough to provide continuous coverage. And over the past 15 years there has been various acquisition plans to develop a globe-spanning constellation of space-based radars. But every one of these has been cancelled, and the cost of these satellites, a constellation of these, is perhaps an order of magnitude more than the cost of CPGS weapons.
And if you read, for instance – so, you know, so that's an example of, to my mind, a clear deficiency is existing U.S. enabling capabilities. And the Government Accountability Office, for instance, has called upon the Pentagon to conduct a study into enabling capabilities. The Pentagon issued a non-concurrence concurrence, which is where you concur with that recommendation, then explain why you’re not going to do it, or at least you’re going to do it in a completely different from to one that was suggested. And so I worry that enabling capabilities are being left out of the acquisition process.

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The fourth issue that I want to flag up today: the international ramifications. Sorry – sorry, one last thing on enabling capabilities, which is, I think, the – this is a good area for congressional involvement. And I think that Congress should require the administration to conduct a study on needed enabling capabilities with costed plans to fill all those gaps. And this needs to happen before CPGS acquisition.

The final issue that I want to flag up today that's missing is the full range of international ramifications about Conventional Prompt Global Strike. One international ramification – warhead ambiguity – has attracted all of the attention so far. And as a reminder, that's the risk that Russia or China could detect the launch of a CPGS weapon, misidentify it as being nuclear-armed, and launch a nuclear response.

There seems to me one particularly problematic case in which that might arise. China does not yet have advanced early warning capabilities, but if it were to develop them, and if Conventional Prompt Global Strike were used for attacks on China, it seems to me that’s the scenario in which warhead ambiguity would be a particular problem.

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And a lot of the analysis of warhead ambiguity to date is how do you convince Russia that a strike on a third country like Iran wasn’t a nuclear strike on Russia? That’s the easy case. The hard case is how you deal with strikes on the – where the strike is not on a third country; it’s on the country with the advanced early warning capability, like Russia or, much more likely, China.

But, that said, there are benefits and risks to Conventional Prompt Global Strike that aren’t being discussed at the moment. One of these risks Elaine Bunn talked about with Vince Manzo when Elaine was an analyst at NDU. She’s now a deputy assistant secretary of defense. But one thing that she pointed out is that boost-glide systems, which are highly maneuverable, unlike ballistic
missiles – you know, when a ballistic missile is launched you know exactly where it’s going to land, or at least at the end of the boost phase – highly maneuverable boost-glide systems, and to an extent hypersonic cruise missiles, have ambiguity about where they’re going to land.

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Countries observing them can’t know where they’re going to land because they’re maneuverable. So this creates a risk that the United States is targeting another country, but Russia, or in the future China, thinks it’s the victim of the strike. And that could arise – that’s a problem whether or not the observing state correctly identifies the weapon as conventional rather than nuclear.

Another problem is target ambiguity, which is uncertainty about whether the United States is aiming for a conventional target or a nuclear target. The best example of this is Chinese command and control, which has been identified as a possible target for CPGS. China is believed to have a shared command-and-control system for its conventional ballistic missiles and its nuclear-armed ballistic missiles.

If, in a deep crisis or a war over Taiwan, the United States attacks that command-and-control system for the purpose of denying China control of its conventional ballistic missiles, Beijing may think that the U.S. is going after its nuclear weapons and is trying to deny China command and control of its nuclear arsenal, and that could be high escalatory.

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There is also the classic problem of crisis instability. That is, if China or Russia or another state believes that Conventional Prompt Global Strike could take out less strategic weapons – by which I mean not just nuclear weapons but anti-satellite weapons – they could have an incentive to use those weapons first.

On the other end of the scale I think there are genuinely persuasive arguments for why Conventional Prompt Global Strike could enhance deterrence. The very fact that war with these weapons could be unpredictable and dangerous can raise the cost of war and enhance deterrence. Moreover, I think there is preliminary but reasonably persuasive evidence that China and Russia and other states think these weapons would be extremely effective, which may also lead them to enhanced deterrence.

In short, there’s a paradox here, if you like: Conventional Prompt Global Strike may make war less likely, but should war occur it could make escalation much harder to control. If you look at
the White House report on Conventional Prompt Global Strike that it sent to Congress pursuant to
the Senate’s ratification for New START, only one risk was mentioned: warhead ambiguity. And I
think that Congress should be asking the administration for a report on the full range of risks of
Conventional Prompt Global Strike.

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Now, in terms of reducing the risk, mitigating these risks, the Obama administration has
stressed unilateral measures of risk reduction. And in particular it’s made a big deal about boost-
glide systems. It said boost-glide systems don’t have ballistic trajectories. So an adversary – a
potential adversary could tell that weren’t a nuclear-armed ballistic missile, and that would reduce
warhead ambiguity.

I think that argument is correct as far as it goes, but there are other risks with boost-glide
systems. You know, one risk that I’ve already discussed is their trajectory is unpredictable. Another
risk is that their trajectory is unobservable after the boost phase. If you’re Russia – or China after
developing early warning capabilities, satellite-based early warning capabilities – you will see the
launch of a boost-glide weapon. The kind of boosters that are used to launch boost-glide weapons
are exactly the kind of boosters that satellite-based early warning is optimized to detect.

But what then happens is the boost – the boost-glide vehicles fly much, much lower than
ballistic missiles. In fact, they fly underneath early warning radar. So what you see is not a – is not a
weapon flying in a nonballistic trajectory. What you actually see is nothing at all. So you detect the
launch and then you don’t detect the flight of the vehicle because it’s flying underneath early
warning radar.

It’s not at all clear to me that this is significantly less risky than weapons on ballistic
trajectories that have predictable trajectories and observable trajectories, because they fly very high
and can be detected by – monitored by early warning radar throughout the whole time.

In fact, you know, there’s clearly no Conventional Prompt Global Strike technology that is
ideal, no Conventional Prompt Global Strike technology that has every attribute you would want it
to have. So trade-offs become inevitable, and these have not been adequately explored, in my
opinion.

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So I conclude that a much more effective way of reducing the risks than unilateral and
technical measures is cooperative confidence building. Some risks can be mitigated with cooperative
confidence building. You know, the risks associated with deciding to do strikes on China are very, very hard to mitigate cooperatively, if at all, but some risks can be mitigated. And let me just make three very, very brief points here about cooperative confidence building.

First, Russia and China are not primarily worried about warhead ambiguity issues. Their primary concern is about the survivability of their forces, and that’s probably the most important area for confidence building. And indeed, they’re not purely or even primarily focused on Conventional Prompt Global Strike; they’re also focused on nonprompt capabilities such as cruise missiles and gravity bombs. And I think confidence building has to be done holistically, not narrowly limited.

Second, I think a lot can be done with narrowly focused confidence building measures: inspections so that Russia and China can be confident that Conventional Prompt Global Strike weapons don’t have nuclear warheads, launch notifications, data exchanges, declarations and joint studies. I think there’s a huge amount that can be done here. I think there is a very strong argument for making conventional prompt or Conventional Prompt Global Strike weapons accountable in a future arms control treaty. The prospects for any other arms control treaty are extremely bleak, however, so I’m not going to discuss that too much.

What I would say is, again, there are very, very real trade-offs here between the particular six systems. For instance, Congress has expressed particular concern about basing Conventional Prompt Global Strike missiles on the Ohio-class submarines that are used to carry nuclear weapons and are used to carry cruise missiles as well in a modified form.

But there’s one huge advantage of basing Conventional Prompt Global Strike weapons on these submarines, which is they’re already part of an arms control regime. It’s very easy to go and inspect Ohio-class submarines. If you base Conventional Prompt Global Strike weapons on Virginia-class submarines, on surface ships, you have the big advantage that they’re not collocated with nuclear weapons but the big disadvantage that the Navy is going to be pretty resistant to inspections of Virginia-class submarines or surface ships. So again, there are very, very, very real trade-offs here.

As I say, I’m very much looking forward to having a conversation with you on these questions. Let me make one remark in conclusion, which is this is a really difficult decision, whether to acquire Conventional Prompt Global Strike, and if so, which systems to acquire.
I don’t know whether I have – you know, as I – I’m kind of genuinely agnostic about the program. If you’re not agnostic I don’t know whether I’ve changed your mind today. That wasn’t my goal. What my goal was is to try and convince you that the full range of relevant issues are not being adequately discussed at the moment. And I hope that that’s the one thing that I have been able to persuade you of, is this is a much, much bigger, more complex and multifaceted decision than the one issue of warhead ambiguity that’s really dominated the debate to date.

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Anyway, thank you very much for your attention. I very much look forward to having a conversation. (Applause.)

MR. PERKOVICH: Thanks, James. That was a terrific summary. You should still read the report, but he summarized it very well.

What we’re going to do now is ask those of you who have a question or want to make a comment to raise your hand. We have colleagues who will bring a microphone to you. And then I would ask you to identify yourself so that the colleagues in the audience and James will know who you are.

There’s a lady here, and then the gentleman on the end there, yeah, Amber, just as backup, yeah. He’s right there, ma’am.

Q: Thank you. My name is Eska Anamyoka (ph). My question is very simple: Were chemical weapons affecting your strategy?

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MR. PERKOVICH: I didn’t understand. Can you –

MR. ACTON: So I think –

MR. PERKOVICH: I didn’t understand your question.

Q: Chemical weapon.

MR. PERKOVICH: Chemical weapon?
Q: Yes, like the Syria, et cetera.

MR. PERKOVICH: She’s asking the relevance of what – you’re talking about prompt goes right to the problem of chemical weapons, if I understood you correctly.

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MR. ACTON: Both the Bush and the Obama administrations have sometimes talked about a counter-WMD role for Conventional Prompt Global Strike, so not just going after another country’s nuclear weapons but going after chemical or biological weapons as well.

That hasn’t been talked about much, and I don’t find that a terribly persuasive role, for exactly the reasons that the Obama administration, at least as public discussion suggests, is not considering hitting chemical stockpiles in Syria, because if you start hitting chemical stockpiles you can disperse those stockpiles.

And I think the problem would be even truer than Conventional Prompt Global Strike than with other conventional weapons, because with Conventional Prompt Global Strike we’re talking about a smaller capability. So you would be bearing much less ordnance against the target. If you really wanted to go after biological weapons or chemical weapons – and I’m not saying it’s a good or bad idea; I’m talking purely in military technical terms here. If you really wanted to go after those targets, you would want to use a lot of ordnance to destroy as much of the material as you could.

And it’s generally regarded as being dispersal is inevitable, but you would want to use as much explosive as you could and Conventional Prompt Global Strike is not the weapon system to do that. So I know it’s very topical at the moment but I really don’t see CPGS weapons 10 years down the line of having a role to play in another Syria-type situation.

MR. PERKOVICH: Right here.

Q: Seyom Brown. I’m with the American Security Project here in Washington, D.C.

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My question is related to this lady’s question in some way. Part of the impetus and the rationale for conventional global strike is, at least implicitly, if not always explicitly – to be consistent with President Obama and the administration’s desire to reduce the role of nuclear weapons for strategic tasks, not only for tactical and lesser-than-strategic attacks even for deterrence, even for nuclear deterrence. And this shows up in the president’s new guidance on nuclear employment to
the U.S. military in which the military is enjoined to pay a lot more attention to conventional
strategic operations and also to discard countervalue targeting – namely, against population centers –
and to re-emphasize counterforce targeting.

Now this is all embedded in this basic orientation of reducing the role of nuclear weapons.
Does this come up in your own analysis or in your own conversations with people who are pushing
for this particular weapon?

[00:46:30]

MR. ACTON: Sure. I mean, there’s a series of very, very deep questions there, and I’m
certainly not going to have a chance to get to all of that. Essentially, the (whole ?) of Chapter One
of the report discusses the conceptual history of the program, does the Obama administration want
to replace nuclear weapons with conventional weapons?

Let me – let me say a couple of words briefly about that but, you know, I encourage you to
look at the report which deals with these questions in much more depth. Doctrinal statements are
extremely cryptic. I often think that when we’re reading Chinese doctrine, for instance, it tells us a
lot – the person who analyzes the doctrine, it tells us a lot more about them than it does about what
the Chinese government is thinking on any particular (issue ?). And there’s lot of – you know, the
statements that have been made about reducing the role of nuclear weapons with conventional
weapons can be read in lots of different ways.

My understanding from trying to read those statements holistically and from trying to –
speaking to people is when General Cartwright was chairman of – was commander of Strategic
Command and vice chairman – then vice chairman of the Joint Chiefs, he was clearly very much in
favor of substituting nuclear for conventional weapons.

[00:47:53]

MR. PERKOVICH: The other way around.

Q: The other way around.

MR. PERKOVICH: Substituting conventional –

MR. ACTON: Conventional weapons – sorry, using nuclear weapons as a substitute for
conventional weapons – using conventional weapons as a substitute for nuclear weapons.
MR. ACTON: And, you know, he was very interested in deeper reductions by conventional substitution. I think he was very much an isolated voice on that question, and I think what the Obama administration is interested in today is kind of two things. Firstly is scenarios in which it warrants that the use of nuclear weapons would not be credible, which is not scenarios involving counterforce exchanges with Russia. It’s Iran, it’s North Korea, it’s anti-satellite weapons. Developing nuclear alternatives.

So the president is presented with a nuclear option and a conventional option and can choose which one to have. And my interpretation of the line that conventional weapons – sorry, nuclear weapons cannot completely substitute for conventional weapons is that there are still going to be nuclear plans there, there would just be choices of nuclear or conventional that will be presented to the president, and those will be scenarios in which the use of nuclear weapons might lack credibility, so they’re not scenarios that are going to help you to draw down numbers massively.

Secondly, if the U.S. retains conventional dominance, then it doesn’t have to have nuclear weapons as a hedge against losing conventional superiority. And conventional prompt global strike could have a role to play insofar as it can help defeat Chinese anti-access air denial capabilities. But again, that’s probably not going to allow the U.S. to draw down nuclear numbers very much. So that’s my interpretation of what all of these different doctrinal statements mean. But, you know – and I can if there’s one section of the paper I collect all of these statements, but as I say, you know, these are – these are cryptic and they can be interpreted in lots of different ways.

MR. PERKOVICH: Next round. The gentleman in the back right behind the camera there. There you go.

Q: Thank you very much, George. Justin Anderson, SAIC. And James, I wonder if I could press back a little on your first recommendation on scenarios-based analysis or assessments. And the reason why is it occurred to me as you were speaking that if we had had scenarios-based assessments of the cruise missile a generation ago, we might not actually have the cruise missile because at that time, many of the scenarios for which it was later used weren’t considered, and also there were folks even within the defense establishment that said why can’t the same thing be done with existing capabilities, you know, better or cheaper, and it was quite a debate.
So I wonder if you could explain a little further why a scenarios-based assessment, especially given that it’s the scenarios we don’t consider that usually lead us to have to consider a new capability of some kind to explain your logic behind why we should engage in that sort of an assessment vis a capabilities-based assessment for considering something like the CPGS. Thanks.

MR. ACTON: Sure. This – I think – I think we could get into a very deep philosophical debate here about scenarios-based versus a capabilities-based assessment. But let me – let me briefly argue two things.

There’s kind of two arguments that I’ve painted today. Firstly is that different CPGS missions have quite different weapon requirements associated with them, that going after a terrorist in the hills of Afghanistan has very different requirements from going after Chinese anti-satellite capabilities and et cetera. And second, that CPGS weapons are all different from one another, that they have different strengths and different weaknesses. Those two things taken together imply to me that if you don’t look at this in the scenario-based way, there is a high risk of buying very expensive weapons that are not found to be very useful because they just don’t have the capabilities of dealing with the specific scenarios in which you’d want to use them.

Now, you know, in general, can you push scenario-based assessment too far? Of course, you can, but I think – I think at a time of fiscal austerity, focusing resources on the threats you think are most likely to arise and on the most effective way of combating those threats is the most strategic way forward.

Let me – let me just give a very brief shout-out because, you know, another paper that I think kind of makes this point very eloquently is Dennis Gormley’s paper; Dennis is here today. He wrote a fantastic paper for Air Free about U.S. conventional superiority and its implications for disarmament, and there’s a very interesting section in that paper kind of discussing technologically driven programs versus strategically driven programs. And so I – you know, I’d also give out a shout-out to Dennis’ analysis of this question as well.

MR. PERKOVICH: All right. Thanks James. This gentleman right here.

Q: James Sang (sp). Two technical questions. One, given the –

MR. PERKOVICH: Please introduce yourself.
Q: James Sang (sp).

[00:53:38]

MR. PERKOVICH: Oh, you did. I thought you were saying, oh James, thanks. (Laughter.)

(Cross talk.)

Q: Two technical questions. One, since you pointed out there are a wide range of missions, could you say something about the demands on accuracy for conventional – especially using conventional warheads? And two, can you say something about how – what the state-of-the-art is, if you assume that you can’t use GPS?

MR. ACTON: I think two great and very important questions. On accuracy, it obviously depends critically on what the target is and how hard that target is.

Now, there’s different kinds of conventional – of warheads you could stick in conventional prompt global strike weapons. If you’re talking about, for instance, going after mobile missiles, you would probably go after that with what’s called flechettes. These are metal fragments that you put a little bit of explosive in, and as the weapon comes in, the explosive explodes and disburses the fragments over a wide area.

I’ve done some calculations, they’re very approximate calculations that I’ll publish in a technical paper that will follow up in which under a very optimistic set of scenarios I think you might be able to destroy a mobile missile within a radius of 100 meters. That’s optimistic, but that, I think is the right order of magnitude. Of course, your target location error, whether you can detect the position of a mobile missile to within 100 meters is the critical question.

At the other end, if you’re going after hard and deeply buried targets and it’s a small underground target, you might just have, you know, two, three, one meter of error. You know, it does depend very sensitively on the target.

[00:55:21]

Second issue that was raised is GPS denial. All of the candidate CPGS weapons systems would primarily rely on the global positioning system, on GPS, for navigation, creating the possibility – and this is a much, much bigger issues than just CPGS – but what happens if an adversary successfully jams the U.S. GPS signal? You kind of have two alternatives. The first one is
to integrate an inertial navigation system, and an inertial navigation system is what you use in nuclear-armed ballistic missiles, it doesn’t need external signals.

It’s not accurate enough for conventional prompt global strike over thousands of kilometers, it might be accurate enough to take over at the end of the flight. Very, very hard to assess from the unclassified where that is. The National Academy study in 2008 was very optimistic about backup inertial guidance. The defense – a Defense Science Board report in 2009 was much less optimistic about the feasibility of doing that. Don’t have the clearances to know the answer.

[00:56:29]

The other possibility is to use some kind of terminal sensor, like an infrared sensor or a visual sensor, but something to detect the position of the target. That’s all – that’s much harder. You have problems both the weight of inertial – sorry, terminal sensors, but also something called target signature stability – sorry, temporal – the temporal stability of the target. Does – you know, how do you train the terminal guidance system to recognize the target.

So – again, this is one of those issues that the options that are available are out there in the public domain, very, very hard to assess where the state of inertial backup guidance is.

MR. PERKOVICH: And this relates to the enabling question that you talked about earlier of all – background – enabling capabilities that would be required to integrate with whatever system that –

MR. ACTON: I mean, GPS is a classic example of an enabling capability.

MR. PERKOVICH: Right. Jennifer and this lady here, in that order. And then we’ll go back – I missed people in the back. Yeah.

Q: Thank you very much, Jim. Jennifer Mcbee (sp). You mentioned at the beginning that Russia was interested in this but, I mean, from what I’ve understood, Russia uses it along with missile defense and a number of other things as to why they don’t want to do further arms control at the moment. I wondered if you could explain that a little more.

[00:57:53]

MR. PERKOVICH: Go ahead and take that and we’ll come –
MR. ACTON: Sure, OK. My point at the beginning was, you know, Russia appears primarily interested in hypersonic cruise missiles. Mr. Rogozin in particular has been very, very vocal in urging Russia to develop hypersonic cruise missiles. He’s even talked about a hypersonic manned bomber, but I think that’s more a fantasy than a – than a serious plan, and the Russian chief of the General Staff recently – and for the first time to my knowledge it was the first public mention of talking about developing boost glide systems – conventional – conventional boost glide systems. Russia’s been interested in the nuclear applications for a while.

[00:58:40]

I wasn’t implying that because Russia was developing those systems it was uninterested in further arms control. I think you’re exactly right that Russia is – it’s hard to convince Russia to be interested in arms control right now for a range of issues. I mean, you know, I think the fundamental issue is just U.S.-Russia relations are pretty poor at the moment.

Ballistic missile defense is the number one Russian issue, the number two Russian issue, though, I think is conventional strategic capabilities. And conventional strategic in the Russian terminology incorporates more than just conventional prompt global strike. So I think this will be a big issue in arms control if it starts. I think there are arms control solutions here.

[00:59:29]

The interesting thing will be, though, if Russia does pursue these systems seriously, will it want to limit its own systems via arms control because, you know, if Russia is pursuing these systems, it would have to agree to limit both sides’ systems or neither sides’ systems.

I mean – you know, I could – I talk a lot about arms control in the – in the piece, but right now, you know, the prospect – I’ve got to be honest about it, the prospects for another round of U.S.-Russia arms control are extremely bleak right now, so I think I’ll hold off right now going through all of the details of the implications thereof.

MR. PERKOVICH: When you say – just to elaborate and then I’ll come here – that the greater challenge actually than Russia will be China in terms of kind of addressing or reassuring Chinese concerns and maintaining –

MR. ACTON: Right.
MR. PERKOVICH: – a kind of stability with China, because in many ways the capabilities and missions that are envisioned here are threatening to China in ways that they’re not so threatening to Russia.

[01:00:38]

MR. ACTON: I think that’s exactly right. I mean, I find the China angle to CPGS much sort of more interesting than the Russia angle. As George says – you know, again I stress this – the Pentagon has not made any doctrinal decisions, as far as I can tell, about what CPGS will be used for, but two of the possible missions are very China-focused.

China’s nuclear forces are much smaller than Russia’s nuclear forces and much less survivable, and the Chinese are a hell of a lot more serious about developing this technology than the Russians are. I mean, the Chinese DF-21D anti-ship ballistic missile is a CPGS-like system. It’s a terminally guided ballistic missile designed to go after U.S. aircraft carriers, other naval targets.

And if you read – I know it’s not called Chinese Military Power anymore – the annual report on Military and Security Developments Involving the People’s Republic of China, that assessed, unambiguously for the first time this year, that China is developing terminally guided intermediate-range ballistic missiles. There were ambiguous hints of that in previous reports but this year was unambiguously China is developing terminally guided intermediate-range ballistic missiles.

So for all of those reasons, you know, I think the China angle – there’s a lot more going on there. There’s both – you know, I think there is, over the longer run, opportunity for reciprocal confidence building with China on this front, which I think is a very valuable thing to pursue. There’s also much greater possibility I think of instability arising in China scenarios than Russia scenarios.

[01:02:18]

MR. PERKOVICH: All right, thanks.

Yes, ma’am?

Q: I’m Audrey Kurth Cronin from George Mason University.

Following your argument that we should have more scenario-based kind of thinking about CPGS, I don’t understand the scenario under which it would be useful against nonstate terrorists. Every terrorist organization that can do the United States harm has learned, under the withering
glare and attack of drones as well as special operations, that they should not gather together in one place and that they should be very careful about how they communicate.

[01:02:48]

And the biggest problem when it comes to counterterrorism has been a lack of good information more than a lack of good means. So how does CPGS help us in any way whatsoever with respect to counterterrorism?

MR. ACTON: The argument – it’s a great question. The argument that has been advanced, including by the National Academies, is this: Imagine a highly reliable source that tells us that a key terrorist will be at such and such a place in half-an-hour and is only going to be there for an hour. We need a weapon that’s capable of getting to wherever that terrorist is within an hour-and-a-half. So it’s where you have this magic nugget of intelligence that comes along and, you know, needs acting on immediately.

I think reading the report you – it’s pretty clear I’m skeptical of this rationale. As you say, you know, historically information acquisition for terrorist attacks has been slow and gradual. And, you know, the fact that, you know, the number-one terrorist was killed with boots on the ground, you know, suggests that you may have strategic warning. On the other hand, other analysts have made the argument that, you know, you can’t know what’s going to happen; it’s possible a scenario will arise.

[01:04:13]

So my policy suggestion is this: Why don’t all of the U.S. agencies involved with counterterrorism go back through all their records and find out if there have been any historical occasions on which the United States would have been able to kill a key terrorist if it had fast enough weapons. And if, you know, there are classified examples of that, and you can go to the president and go, you know, here are three examples from the last 10 years of where, if we have this capability, we would have been able to get a high-ranking terrorist, that’s pretty significant. And if the counterterrorism agencies can’t identify any such examples, that’s pretty significant too.

But unquestionably, you know, there are real challenges, you know, verifying that – you know, even if this magic nugget of intelligence did arrive, you know, you’d have to verify. You’d have to verify the target. You’d have to do the collateral damage assessments. Again, it’s a really difficult mission for enabling capabilities, and very different enabling capabilities from, you know, satellites to track down dispersed mobile missiles.
MR. PERKOVICH: Thank you.

Ed Levine, right there, Wyatt (sp). And then we’ll go next to the gentleman with the beard a few rows back.

Q: Edward Levine, retired gadfly. (Laughter.)

MR. PERKOVICH: No, you’re a gadfly – you are a retired Senate staffer, yeah. (Laughter.)

Q: Well, whatever.

If I understand correctly the conventional wisdom about Prompt Global Strike, it is an extremely expensive niche system, perhaps a niche system precisely because of its expense. I wonder whether you found any indication that, if we developed one or another system, there might be the possibility of economies of scale, which, like the example of the cruise missile, would make it something other than a niche system.

I also wonder whether a reasonable justification for at least slow development is simply to maintain technology dominance, even if you’re never really going to find something that works well enough to field it.

And finally, I wonder whether interesting comparisons can be made to a generation ago when people thought about FOBS.

MR. PERKOVICH: What are FOBS?

Q: Fractional Orbital Bombardment Systems.

MR. ACTON: Fractional Orbital Bombardment Systems.

MR. PERKOVICH: Where was I when that – (laughter).

MR. ACTON: Obviously not paying enough attention.

MR. PERKOVICH: (Chuckles.)
MR. ACTON: OK, economies of scale. Developing a small Conventional Prompt Global Strike capability might be relatively cheap, where “relatively” means only a few billion dollars, for the following reason: If you use retired nuclear missiles – Minuteman II, MX Peacekeeper, Polaris A2, A3, whatever – you have the expensive part of the CPGS system already made. At that point it only comes down to fabricating the glider, or whatever. So you can get to tens of systems relatively cheaply.

[01:07:58]

There are pros and cons of using existing delivery systems that I discuss in the paper. If you want to go to a bigger deployment and you have to design and build a new missile, then all of a sudden the price jumps significantly. At that point, though, then economies of scale can start to kick in. I mean, a hundred weapons – if you have to build a new missile, it’s going to be very expensive per weapon. A thousand weapons – not, I stress, anyone is ever talking about doing something that large for the time being, but a thousand weapons, you know, you then would get huge economies of scale relative to a hundred weapons. The cost per weapon would go down very significantly.

I haven’t actually – I’ve never heard anyone say – it’s an issue I raise in the paper but you are the first other person I’ve heard say that, which is understanding this technology in case potential U.S. adversaries do it is a good reason to keep on research and development efforts. And I agree. I mean, I’m not sure it will be a decisive argument, in my mind, but it’s certainly something there in the factor.

FOBS. During the Cold War, at some glorious time during the late ‘60s and early ‘70s, people started to get very worried about the idea of putting a nuclear warhead into a fractional orbit. So you’d stick it into orbit and it would go part the way around the world and then de-orbit onto the target. And it would be a way of the Soviet Union evading U.S. early warning systems by approaching from a direction that wasn’t covered by radars.

FOBS was – would have been banned for a period of time by SALT II, the Strategic Arms Limitation II, which never entered into force. And nuclear-armed FOBS is arguably banned by the Outer Space Treaty. It is an argument – it is a – you know, it depends on how you interpret particular words, and I’m not going to go into it now.

[01:10:10]
CPGS would not be—fall under the Outer Space Treaty, for two reasons, clearly: firstly because it’s not nuclear, it’s conventional, and the Outer Space Treaty only dealt with weapons of mass destruction; and secondly because unless these things go very, very fast—you know, close to 7,900 meters per second, which is orbital velocity—I think you can argue they’re not in orbit.

So there are differences between the FOBS systems that were being considered and the CPGS systems now. But it’s not often we get a chance to talk about FOBS publicly, so I appreciate the question.

MR. PERKOVICH: And now that you have, I’m not sorry I missed the whole thing. (Laughter.)

Another question? Have we exhausted—no. Yes, right. I promised. Thank you for raising your hand again. I forgot.

Q: I came today just so I could be—(laughter).

[01:11:05]

Q: Stuart Montgomery (sp) from the Center for a New American Security.

You mentioned, I think correctly, that the unpredictability of these weapons can enhance deterrence, but when you enhance deterrence you also enhance risk, which you mentioned. And there is a need to mitigate this risk, and you give some ideas, namely things like possibly arms control but, more importantly, inspections, data exchanges, et cetera.

But how much of this risk is actually created off of how the U.S. targets these weapons? Namely, you mentioned command and control, anti-satellite weapons, and air and ballistic missile defenses. And to an adversary that would seem that there is a larger campaign coming, especially when we look at suppression campaigns against A2/AD systems in the Pacific.

[01:11:45]

MR. ACTON: Yeah. You know, I think—I think that’s exactly right. I mean, firstly I think U.S. targeting policy is only ever going to have a limited effect on adversary or even non-adversaries’ threat perceptions. Like the issue with Russia is, you know, no one is arguing for the use of these weapons against Russia. Russia thinks that it’s all about Russia.
So frankly, whatever the U.S. says about how it targets these systems – and the historical norm is actually to say very little, but even if the U.S. was to kind of publish targeting doctrine the assumption would be that it’s all made up. So, you know, that’s the first issue.

The second issue is, you know, let’s imagine the U.S. uses a CPGS weapon against Iran, and Russia detects the launch and sees it coming roughly in Russia’s direction. Again, because the system would be – you know, because boost-glide systems especially would be unpredictable and unobservable, you know, Russia would only have the U.S. word to go on about where the target was.

[01:12:54]

So, you know, in the final analysis there is no risk-free option with any of this, right? Like, not developing CPGS is risk – is not risk-free. There are risks associated with not doing it. There’s risks associated with doing it.

My goal with this project is not to make any grand conclusion, but it’s to break that analysis up. It’s to highlight all of the different areas of risk associated with both proceeding and not proceeding, and then let, you know, other people argue about how that weights together. That was kind of the biggest service I thought I could provide in writing the report.

MR. PERKOVICH: All right, any others? OK, well, then again let me thank you all for coming and ask you again to thank James for providing the text, which I hope you all will read, that occasioned this event. (Applause.)

(END)