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SECURITY CHALLENGES DURING A TIME OF TRANSITION

THE 21ST CENTURY DEFENSE INITIATIVE'S
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FELLOW RESEARCH SYMPOSIUM

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PARTICIPANTS:

Welcome and Introduction:

PETER W. SINGER
Senior Fellow and Director, 21st Century Defense Initiative
The Brookings Institution

Opening Remarks:

THOMAS E. RICKS
Author, *The Generals: American Military Command from World War II to Today*
Senior Fellow, Center for a New American Security

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Moderator:

LIEUTENANT GENERAL JAMES M. DUBIK (Ret.)
Senior Fellow
Institute for the Study of War

Panelists:

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Federal Executive Fellow, The Brookings Institution
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COMMANDER SCOTT T. FARR (USN)
Former National Security Fellow, Harvard University
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U.S. Coast Guard Fellow, RAND Corporation
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PETER W. SINGER
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CAPTAIN BRIAN PENOYER (USCG)
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National Security Visiting Fellow, Stimson Center
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P R O C E E D I N G S

MR. SINGER: I'm Peter Singer, Director of the new Brookings Center for 21st Century Security and Intelligence, and it's my great pleasure to welcome you to this session, which is actually the first of our new center that launched as of 9:00 a.m. today.

The Center, or 21CSI, as we're already calling it, because we've got defense folks and we have to use our acronyms, it was created to address the key issues that will shape security policy in the coming decades. The center will bring together work on everything from defense policy, to arms control to cyber security to intelligence community issues and what we're going to try and do is seek not just to explore the new policy challenges that are emerging, but also how they cross between traditional fields and domains.

And it's with this mission in mind that we couldn't be more excited about this conference today. This is an event that will connect the dots in multiple ways, linking the research world with the policy world, but also bringing together so many of these different areas that are so important to understanding the theme of this conference: security challenges in an age of transition.

Now, a little bit of background for those of you who are new to the Fellows program. Like a number of other think tanks out there, whose members will be represented at sessions today, Brookings hosts the Federal Executive Fellows Program. These are officers from all of the services and several government agencies who spend time conducting independent research on issues faced by the national security community today.

Now, it's important for me to note, especially for the media that are in attendance, that the research and the policy recommendations that come out of it, as well as the statements that are being made by these officers here today, are not about espousing official policy, rather, this is a research symposium intended to provide a greater awareness of the valuable research work that these leaders are producing on cutting edge issues, in particular on topics or with research approaches that the regular bureaucracy is often finding a difficult time to deal with. That's why the topic of this symposium is so apt.

We're going to feature research on topics that range from cyber to nuclear issues with North Korea. Now, what is striking is that while all of these are in the news, literally, today, the fellows that you're going to see present chose these topics to conduct research on them back in the fall and it shows both their foresight but also how issues evolve.

At each of these panels, military fellows presently serving at think tanks or universities from across the nation will present the research that they've carried out over the last years. In essence, what we're all about to enjoy is an event organized by military officers, designed to highlight some of the best research being conducted by military officers today.

Now, before we get to that part of it, I have another task, which is to hit the logistic side of things. First, you'll notice in the schedule that we've built in breaks between the panels where you'll be able to get up, stretch your legs, grab some coffee or snacks or the restrooms in the back, so feel free to use those, but during the sessions we hope that you'll stay seated.

Second, after the 12:30 speaker, we'll have a buffet lunch provided in the Saul/Zilkha Room, which is just over there, and what we're going to ask you is that after you get your food, you come back in this room so we can move on to the next panel. So, it's an eat-at-your-seat kind of session.

And finally, a protocol issue, during the Q&A session we ask that you wait for the mic to come to you, that you stand and introduce yourself, and at this symposium, at least, every question ends with a question mark.

Now, with all of that out of the way, I'm delighted to welcome our opening speaker, and it's not him, but we are going to hear some thoughts, I think, that will link to the General.

Tom Ricks is Senior Fellow at the Center for New American Security and a contributing editor at *Foreign Policy* magazine where he authors the *Best Defense* blog, which is a must read locale on the web for national security issues.

Before joining CNAS, he covered the U.S. Military for *The Washington Post* and before that *The Wall Street Journal*, reporting on U.S. military operations from all the corners of the world -- Somalia, Haiti, Korea, Bosnia, Kosovo, Macedonia, Kuwait, Turkey, Afghanistan, and Iraq, including earning a Pulitzer, which is, I think, interesting to this topic today, for his series on new demands on the U.S. military in the 21st century.

He's also the author of a number of award-winning books on the military including, most recently, *The Generals: American Military Command from World War II to Today*, in which he explores the military values, strategic thinking, and leadership that has shaped the service of today.

So, as I'm sure all of you have figured out in terms of our thinking of inviting Tom to join us, for a conference that brings together top research and writing, cutting edge defense issues, and a crowd full of likely future flag officers, you couldn't do any better than to have Tom Ricks join us. He's just about as great a fit as you could find. So, Tom, thank you.

(Applause)

MR. RICKS: Good morning. For the people who are standing up in back, there are seats open up in front here, but if you want to stand up, go ahead.

Can you all hear me in the cheap seats? Great. Okay.

I thought I'd talk for about 15 minutes and then get into your questions and answers, which are the more illuminating part of this sort of session.

The talk I'm about to give you I normally do in about 45 minutes, so we're going to do it real fast. So, fasten your seatbelts.

The first thing I want to talk about is something that speaks to your next billet. I think a lot of you will move into senior positions, you may be flag officers or you may be senior staff officers in Washington dealing with civilians, so a few thoughts about the bureaucracy in Washington.

After that I will get into this guy.

Bureaucracies dislike innovation, no matter what they tell you. Bureaucracies are not good at changing. In wartime, especially, the military bureaucracy will do not what it needs to do, but what it knows how to do. If you want more on that, just Google Komer and *Bureaucracy Does Its Thing*. It's the best thing I've ever read on the military bureaucracy. It's available online and it's Bob Komer's summary of what went wrong in the Vietnam War.

If you want to have some dismal fun, use search and replace and take out Vietnam and put in Iraq. It works as an analysis.

This is not to say that bureaucracies are inept. They are very apt at certain things. Bureaucracies are very good at defending themselves. They are optimized for self-defense, not to represent the interests of their leaders, but to defend the bureaucracy's own interest.

Bureaucracies have an enormous capacity to absorb criticism. It's like punching the Pillsbury Dough Boy.

Bureaucracies can out wait you. Their attitude is generally, we're going to be here four or eight years ago -- this is basically the attitude towards the Executive Branch -- you're going to be gone, we're still going to be here.

And while bureaucracies are very poor at changing, they are very good at adapting the language of change. They're hyper-attuned to buzzwords. You know, you want transformation, fine, this is a Transformational MRE. I was down at Quantico last night, the new buzzword in Marines is "expeditionary", everything is expeditionary. Fine, here's an expeditionary wallet, you know, they will just attach their buzzword to whatever you are coming at them with.

So, how do you handle this? My bottom line is, speak truth to power. Don't be a pain in the ass about it, don't be a burr under the saddle, don't be complaining about the coffee every morning, but when it's important, when it hits your moral center, when that little voice in the back of your head says, this isn't right or something's going wrong here, speak up. Don't speak up because people are going to thank you for it. They're not going to say, "Oh, good, you pointed out we're a bunch of hypocrites. We really appreciate that." They will not thank you for it.

Why do you do it? Number one, so you can look in the mirror in the morning, number two, because, God damn it, it's your duty, it's a matter of self-discipline, you're supposed to do it as a military professional.

George Marshall spoke truth to power, and I want to talk about Marshall especially because George Marshall did not acquire this habit as a Brigadier General. The only way to have the habit of speaking truth to power is to do it every day. It has to be a habit, a habit of moral-centeredness, aspiring to excellence, and you do it respectfully, you do it inside the system if at all possible, you do it alerting your chain of command rather than blindsiding them, but you do it.

In World War I, Major, then, Marshall was the first member of The

Division, as the Army called it because it was the only division they had, that later became the 1st Division and then the 1st Infantry Division, he was the first member of The Division to arrive in France. And he started working on training up The Division.

After a while, General Pershing showed up, the American Commander in France, to see the 1st Division's exercises. He was appalled. They were sloppy, they were not attuned to what was happening at the front, they were slow, commanders didn't know their roles, and so on.

Major Marshall stepped up and said, "You really should stop yelling at General Sibert," the Division commander, "because there are some things you need to know here."

General Pershing was not interested in hearing this and he began to turn away. Major Marshall -- and I don't recommend this as a career path -- Major Marshall reached out and grabbed General Pershing by the right arm and said, "You need to hear this", and he laid out the problems that Pershing had not been aware of but should have been aware of, laid out how far they'd come in a few short weeks without any help from General Pershing.

Pershing was impressed. He fired the Division commander a couple of weeks later, but the next time he came to The Division, he looked up this young major, and pretty soon Marshall was running U.S. troop movements for the entire front, and in fact, planned the movement of half a million troops in and out of the frontlines for the big American offensive in the fall of 1918.

I began thinking about all this in Sicily in the summer of 2005. I was on a staff ride looking at the American, British, and Canadian campaign in Sicily summer of 1943 and one officer was playing General Terry Allen, who, by coincidence, was commander of the 1st Infantry Division in Sicily, and the officer mentioned that Allen had arguably saved the American landings in Southern Sicily in the first 24 hours when he had attacked the Germans before dawn and then had won the culminating battle in the campaign at Troina, the last hinge on the last German defense line.

After winning that battle in August 1943, General Allen was fired by Omar Bradley. Well, I was stunned. I had just come out of Iraq and I said, “Wait a second, they fired one of the most successful division commanders in the first year of the American war in Europe? I just came from Iraq where nobody gets fired for anything, where mediocrity has become a core value. How could this be?”

And a friend of mine, Colonel Bob Killebrew said, “Tom, you need to study George Marshall.” And it was a fateful comment. I spent the next two years immersed in the works of George Marshall, reading his papers, reading the four-volume biography by Forrest Pogue and then the transcripts of all the interviews Forrest Pogue did with Marshall. By the way, the transcripts, the interviews, are much better than the biography. Pogue was a good interviewer; he was not a very good writer. In fact, Mark Stoler’s biography of Marshall is better and much shorter than Pogue’s.

Who was George Marshall? Marshall’s core characteristic was honesty. He spoke truth to power. First you have Pershing. In 1938 he’s a brigadier general. He is in the Oval Office at a meeting with the President about military readiness issues and the President knows that Marshall, who’s not yet Chief of Staff, is opposed to the President’s views. So, the President, being a smart Machiavellian politician, terminates the meeting and says, “Isn’t that right, George?”

Marshall makes two things clear, number one, no, he doesn’t think it’s right, and number two, his first name is General, not George. He believed that by calling him George, President Roosevelt is misrepresenting the relationship.

And this goes to something I want you to really push General Dubik on when he's speaking, on civil military relations, why the civil military interface is so key and what good civil military relations are. Marshall was not buddy-buddy with Roosevelt. He actually refused to go to Roosevelt's house in Hyde Park, New York, did not visit it until he was a pallbearer at Roosevelt's funeral. He refused to laugh at Roosevelt's jokes. He didn't like having dinner with the President. But he gave the President truth as he saw it. He did not leak it when he lost out on arguments, he was very professional, he was very loyal, but he believed loyalty was telling the President exactly what he thought.

Roosevelt understood this and appreciated it. Roosevelt was a world-class bullshitter and somebody who's a world-class bullshitter, who's smart, knows they need somebody to throw the BS flag at them and he knew that Marshall would do it.

So, Marshall was appointed Chief of Staff, actually becomes Chief of Staff formally on September 1, 1939, the fateful day.

A few months later, as Chief of Staff, picked by Roosevelt because of his penchant for telling the truth, he's in the Oval Office again, it's May 1940, the Germans are blitzkrieging through Belgium and into Northern France, the Dutch government has just fallen, Winston Churchill is taking over as Prime Minister finally in England and is preparing his "Blood, Sweat and Tears" speech, which, by the way, is a pretty good description of the British order of battle at that point. They had left all their machinery at the beaches at Dunkirk when they got their troops out. What they had left in England at the time was about what a modern American mechanized brigade has, that's all they had, plus airplanes and ships.

Marshall's in the Oval Office, and again, the President is hesitant on mobilization. The President is running for an unprecedented third term in the fall of 1940. He's worried that the isolationists, the Midwesterners, the anti-New Dealers, and the left might come together and achieve a majority against him. He actually says during the campaign that he will not send American boys to die in Europe.

Marshall's going nuts. Marshall knows the most important thing a general does are the things you do before a war begins. So, he's in the Oval Office again and the President ends the meeting before Marshall speaks. Secretary of War, by the way, when you're looking around for support, Secretary of War doesn't say anything. Marshall's sitting there and he finally says, "Mr. President, may I speak?" "Of course, General Marshall," Roosevelt says. He says, "I need to speak for three minutes." Marshall, for the only time in his life, gets up and uses the President's disability against him. He stands up and looks down on Roosevelt and says for three minutes, "If you don't do something today, sir, I don't know what's going to happen to the world."

Treasury Secretary Morgenthau later credits that date as the day that Roosevelt got serious about mobilization.

George Marshall was a great man. He was a good man. He was not a nice man, he could not afford to be. He's a man who fired old friends in World War II. Before the war even began, he and a young colonel, Matthew Ridgway, sat down and designed how to get rid of 600 senior officers they deemed "deadwood". Then they devised a system of command in World War II in which you had several hurtles to pass. First, you had to be selected for a division command in the United States. Second, you had to be allowed to take that division overseas. And the theater commanders -- Eisenhower and MacArthur -- had veto power.

Then, once you were overseas, you had to be allowed to take that division into combat.

In World War II, 155 men were allowed to take Army divisions into combat. Of that 155, 16 were fired for combat inefficiency, that's a relief rate of more than 10 percent. It was a Darwinian meritocracy. In World War II, under the Marshall system, which was very much in the American tradition of the revolution and the Civil War and World War I, but it was more systematized under Marshall, you had about 90 days as a regimental battalion, brigade, or division commander, you had about 90 days in which to succeed, get killed or wounded, or get booted.

Now, when you got booted, you weren't kicked out of the military. It was a rapidly expanding military and so they found other positions for you, usually training positions, but of the 16 who were fired, 16 division commanders fired in combat, 5 got other divisions in combat later in the war.

The result of this is you had an adaptive military, you had accountability for success. Everybody in the military these days is talking about accountability. The Army keeps on -- you want accountability, you don't issue a regulation on it saying, "you will be accountable", you hold people accountable as a fundamental of leadership. You don't fire people for making one or two mistakes. People who are not making mistakes are not trying hard enough. You fire people for patterns of incompetence or failure.

Bernard Lewis we now remember as one of the neo-conservatives who advised President Bush on the invasion of Iraq. But in World War II, Bernard Lewis, the Middle Eastern historian, was a British military intelligence officer. He said watching the Americans in World War II he came away with two observations. First, he said, "You couldn't tell them a damn thing." The second thing he said that was even more striking, "They didn't repeat their mistakes." They learned. It was a learning organization unlike, by the way, the British military of World War II.

The result of the Marshall system in World War II is that very few Americans know today who Lloyd Fredendall is. Very few military officers know who Major General James Chaney was. Anybody here know? Don't feel bad. I asked 900 majors at Ft. Leavenworth recently and nobody knew there either.

Major General James Chaney was Eisenhower's predecessor as the American commander in Europe. Marshall decided he didn't have his head in the game and moved him out and put Eisenhower in and General Chaney wound up World War II commanding a boot camp in Wichita Falls. General Eisenhower became President.

But we do know names of others -- Jim Gaven, Matthew Ridgway, and I would say, most of all, Eisenhower.

So, what happened? The big change came in Korea. Ridgway, who, by the way, was much closer to Marshall than Eisenhower. Ridgway really was Marshall's leading protégé. In fact, Marshall was at Ridgway's house when he learned he would become Army Chief of Staff.

Ridgway takes over six months into the Korean War. The Korean War is stunning. Not once but twice, Asian peasant armies hurl American forces down the peninsula in the first six months of the war, first the North Korean military, then the Chinese. This is a force the Americans, who just five years earlier had defeated, along with some other people, defeated the Nazis and the Japanese empire, and here they were having their butts kicked by forces that lacked many aircraft, trucks, or tanks.

Ridgway goes in and very quickly decides he wants to fire five of the six division commanders and half the regimental commanders in Korea at the time. Wade Haislip, then the Army Vice Chief of Staff, sends him a rocket. He said, "Ixnay on this. And you've got to be really careful about it," he says, "because Congress is asking questions. This is an unpopular war, the Congress is very divided, so you really need to be careful about this. We are going to tell people these are not firings, these are planned rotations."

And he actually says this in a cable that I found up at Carlisle in my research. He says, "Joe Collins is already up on the Hill lying about this, so you better keep up the story." Joe Collins, by this point, is Army Chief of Staff. So, he's told -- Ridgway is told, you can relieve these five guys, but you've got to keep it on the down low.

The first guy they couldn't because he'd only been in command a month, of the division, so they said, yeah, that's a firing. The other guys they pretended they moved them out -- and he was actually told to park some people -- we don't have a position for that three-star here, create it, make him like an assistant army commander, make him a deputy to somebody, just park these guys.

In Vietnam, the tradition of relief was lost entirely. The relief rate, as best I can make out, in Vietnam, was about .5 percent, one division commander relieved for combat ineffectiveness, Major General James Baldwin, Americal Division, 1971.

I don't think that the generals of Vietnam were 25 times as good as the generals of World War II. I think the Army lost something in Vietnam and it hasn't recovered it. Look at Sam Koster, commands the Americal Division during the My Lai Massacre, 400 men, women, and children massacred by American troops, 40 women and girls raped, people thrown down wells with grenades thrown after them, peasants made to sit in a circle while grenades were fired into their midst. This was not a rogue operation by a platoon; it was a two-company operation with the battalion commander present, the brigade commander overhead in a helicopter, and the division commander almost certainly aware of it.

The investigation by the Army was magnificent. I think it redeemed the Army's soul. General Ray Pierce should be an American hero and remembered as such. Koster, the division commander, was an old friend of his. He investigated it and was shocked to find that Koster lied to him in the course of the investigation and he concluded that Koster, the division commander, was guilty of the felonious destruction of documents in the cover-up. Koster was not relieved.

At the time of the investigation, he was a three-star superintendent at West Point. He was reduced to two stars and sent to Aberdeen. By the way, whenever you see an officer sent to Aberdeen, you've just got to wonder what's going on. Is this where like the Army hides troubled officers, troubled general officers?

The result is that today, being an Army General is like being a university professor. You can be mediocre at your job as long as you keep your pants on. That is to say, professional incompetence is tolerated as long as you don't embarrass the institution by sleeping with the undergraduates or the junior officer equivalent. It's like having tenure.

To conclude, I would say that I believe today's generals lack discipline. We all know what a disciplined enlisted man looks like. But I think we don't know anymore what a disciplined general officer looks like.

George Marshall would not have gone to work in the defense industry. When Henry Luce offered him a million dollars to write his memoirs, he turned it down. Marshall didn't have any money, he lived on his salary, but he turned it down because he said, "I'd either have to lie or hurt the feelings of a lot of people, so I'm not going to write World War II memoirs."

George Marshall would have not gotten up on a stage and endorsed a presidential candidate. He might have done it as George Marshall, but he certainly would have not done it as General George Marshall, U.S. Army Retired. I think that's another form of indiscipline by generals.

Today's generals, I think, do not enforce standards for their peers. They act more like a guild than stewards of a profession. And most of all, I do not believe that as a matter of habit, that they speak truth to power.

And now you can see why Jon Stewart calls me “Little Mr. Sunshine”. That takes care of my prepared remarks, now I’d love to get into your questions, answers, enunciations, whatever. Just a couple of requests, don’t be too polite. I was a reporter for 25 years, I’ve got very thick skin, and please identify yourselves, apparently, according to the ground rules.

So, any questions?

MR. ANGEVINE: John Angevine, a retired colonel, U.S. Army. I’m curious, I’m just coming out of Afghanistan, what kind of legacy do our generals leave for the leaders that we’re trying to develop through Commander and General Staff College and even those senior captains coming in, when we’ve had a succession of General Petraeus, and even General Allen, although I don’t -- some mud has slinged his way, but nothing found on him -- in terms of trying to provide that discipline for officers to -- for current serving officers to provide that role model and that discipline for officers as they start to enter the battalion and brigade ranks so that they can prepare themselves to be general officers.

MR. RICKS: I think the legacies that I see are primarily negative. I think we’ve seen a generation of tactically magnificent officers who are well trained but not well educated. Training prepares you for the known; education prepares you for the unknown, for the uncertain.

I think Tommy Franks is Exhibit A in this. Tommy Franks, I don’t think was an anomaly. He was exactly what the post-Vietnam rebuilding of the Army was designed to produce. But in the course of that, they confused battalion command with general-ship, especially because of the influence of the NTC and the other training centers. Somehow battalion command became -- your performance at the NTC became the measure of a general, when in many ways it’s the opposite.

I mean, there's a reason -- a general officer, by definition, is a generalist. You take off the branch insignia. You are supposed to get your head up in the air more and think. But people like Franks believe you can outsource thinking. I don't think you can outsource thinking anymore than you can outsource leadership.

I mean, why do I say Franks is uneducated? Because he believed, for example, that pushing al-Qaeda from Afghanistan into Pakistan was a good idea. To push Islamic extremists from a small, unstable Muslim nation to a large, unstable Muslim nation with nuclear weapons doesn't pass the strategic laugh test.

Likewise, he also seemed to believe that taking the enemy's capital, that he'd won the war, when, in fact, that was when the enemy began fighting.

Here's a guy who fundamentally does not understand the conflict he's engaged in, as Clausewitz says, is the first task of the commander.

I think the rebuilding of American generalship would be a 20-year project, but I don't think it's undoable. I think the inter-war period has a lot of lessons. If you look at Omar Bradley, for example, he spent more than half the time between World War I and World War II in the classroom, either as a teacher or as a student, but in order to do that, you'd have to get PME off its ass. I think it's a joke, especially the Air War College and other parts. The lack of intellectual rigor is stunning to me. The fact that officers resent having to learn how to write as majors.

When I spoke at Leavenworth, the faculty had a phrase they used, "no major left behind", which I find pathetic. What you need is intellectual rigor, hard work, a lot of reading, a lot of writing. I would also have transparency. I would have class rankings and I would release them publically at the end of the year.

The PME system has debased its currency. Nobody says, "Get me a CGSC guy." People knew that Eisenhower graduated number one and there was a reason. Nobody cares now.

Now, look, I know a lot of officers have worked really hard over the last ten years, but I would have been more innovative about it, I think. I would have had, for example, a sabbatical system. You've had three hard tours, take a year off, go home with your wife and kids. Let her get the Masters' Degree she's been wanting to get. Take a year off and then when you're rested and ready, come back in for a year of intense study at the War College.

Yes, please?

MR. BECHIR: Hello. Adam Bshir, embassy of Iraq. I just wanted to ask, what can be done today to replicate what George Marshall did? What can we do to produce more George Marshalls? Thank you.

MR. RICKS: Ultimately, I think it has to reside with the nation. I think you have to have a people engaged and that engages the Congress and then the Congress engages in oversight. Right now, not much of that is happening.

If I wrote a book about the last ten years of war, I'd call it *The 1 Percent War*, 1 percent fought, 99 percent were disengaged. I think it's hazardous for a great democracy to engage in wars overseas without its people paying attention, so ultimately if you want more George Marshalls, it sounds odd, but I would restart a draft of some form. Put skin in the game.

When my nephew joined the Marine Corps, my sister, a Santa Barbara, California liberal, suddenly got really interested in Afghanistan. You know, she had a Volvo that had one of those bumper stickers, "Wouldn't it be great if the Pentagon had to hold a bake sale", and suddenly the Volvo had another bumper sticker, "My son is a Marine." She got engaged. I think we need national engagement.

We have time for one last two-hander, a very quick question -- two-hander is defined is if you don't get to ask it, you're going to go home muttering to your spouse.

MR. MITCHELL: Thanks very much. I'm Garrett Mitchell and I write *The Mitchell Report* and I want to ask a question that has two quick parts to it. The first is - you've talked only about the Army. My question is, is this disease that you talk about across the board with flag officers? And the second is the extent to which you talk about the demise of leadership, et cetera, is that a factor that you think is unique to the Army/military or is that something that's kind of a creeping disease in a number of institutions in the country?

MR. RICKS: The question being, no, I actually think there's more accountability in America, especially in corporate America, than there was say 10 or 15 years ago. If you look at the McKinsey numbers on the relief of CEOs, they're much higher than they used to be, and by the way, much higher in Europe than they are in the United States in American corporations.

So, I actually think there's more demand for performance than there is in the U.S. military. It's watched very closely.

Second thing, other services, the Navy is still more in the nautical tradition and it seems to relieve at the 06 level, but I'm not sure whether that's because they pick 06 level skippers so badly, but in the Marines they're somewhat in the nautical tradition still. For example, Mattis relieves Joe Dowdy during the Invasion of Iraq.

The Air Force I think is simply too young, it hasn't decided what its culture is, for instance, dominated by the bomber mafia than by the fighter mafia, and now it's becoming a drone service, so presumably ten years from now the Chief of the Air Force will be a robot.

Thank you very much.

(Applause)

LIEUTENANT GENERAL DUBIK: Well, I think that got enough intellectual juices going and should sustain us for the rest of the time.

Good morning. I'm Jim Dubik, retired U.S. Army Lieutenant General, so I'll be happy to talk about that in light of Tom's comments as well.

I'm an infantryman, paratrooper, ranger, 37 years in the Army, a little bit about my career, of course, I commanded everything from platoon to corps. My last job was in Iraq during the surge accelerating the growth of the Iraqi Security Forces.

But a few things that maybe you won't find in my bio. Number one, I worked in a zoo for two and a half years during high school. And my wife, whenever people would say to her, you know, the General really knows his (fill in the blank), she said, well, he should, he worked in a zoo for two and a half years.

I was in a Catholic monastery for a while. It took me about a year to figure out that I was chosen -- called but not chosen and got out to date Joanne (inaudible) after that. And I also have a degree, a master's and bachelor's degree in philosophy, and I came in the army primarily because of that degree. My dad, who was a draftee in World War II said, "Jim, what job do you have?" and of course I said, "None." He said, "Good. Go in for three years," and became a regular Army officer and stayed in.

So, my honor to introduce three really great officers here. The first, to my left, is Colonel Paul Paolozzi. He's a Federal Executive Fellow here at the Brookings Institute. He'll be talking on candor and trust in the Army. He's a career combat engineer, two tours in Afghanistan, first as a battalion commander and second as an engineer brigade commander. He's been the Military Assistant to the Assistant Secretary of Defense for Reserve Affairs and a fellow to, then, Senator Hillary Clinton, also an aid to the Vice Chief of Staff of the Army, and having served, finally, on the Joint Staff J5.

To his left, Commander Scott Farr, former National Security Fellow at Harvard, currently in the J3 division of the Joint Staff. He's a Naval officer. Four carrier-based deployments on the Carl Vinson, the Abraham Lincoln, the Dwight D. Eisenhower in the Mediterranean, the Western Pacific, the Northern Arabian Sea, and the Arabian Gulf.

He's served three expeditionary deployments -- Aviano, Italy; Bagram, Afghanistan; and a year on the ground with Multi-National Corps in Iraq as the Electronic Warfare Officer. He's just recently commanded the Patriots of the squadron VAQ-140.

And to his left, Commander Laura Collins of the U.S. Coast Guard, is a fellow at the RAND Corporation. She's served aboard five Coast Guard Cutters as a desk watch officer department head and an executive officer. She's been at sea for over eight years on cutters stationed on both coasts and in Alaska.

Her most recent tour as the First Executive Officer and Plank Owner, which I found out meant the officer on the original sail of that ship, okay, of the Coast Guard's newest national security cutter, the Cutter Stratton. And she's had shore duties that include a military aid to Deputy Secretary of Homeland Defense and as a strategic analyst for the Enterprise of Strategic Management Director in Coast Guard headquarters.

Commander Farr will speak on Naval leader development and the fitness reports and Commander Collins will speak on diversity in the Coast Guard. So, I'll turn it over to Colonel Paolozzi.

COLONEL PAOLOZZI: Sir, thanks very much for moderating this panel. I appreciate you being here today. And thanks to Tom Ricks for what seemed like almost an introduction when you were speaking about candor.

Candor was actually not among my topics that I wanted to research when I came to Brookings, but as I took more of a general interest, or past the general interest into the topics I was looking at, it seemed like candor percolated to the top as the one common thread that all of the topics I was looking at had as a common theme.

My wife would tell you that I picked candor because nobody wants to be associated with not having candor in their organization, so it makes it tough to attack me. So, that's her perspective.

When you look at candor, it has an impact not only from the interpersonal level, but to the national security level, and I think Mr. Ricks brought that to light. Possibly it could be involving facts that are unsavory or difficult to express, and it takes a leader to be able to use candor and express them articulately.

I would also tell you that through a quick glance, a lot of people look at candor and think it's simply truth telling, and that's, in my opinion, not the case. There are a lot of people, especially in Washington, who think that they're telling the truth, but have no measure of candor when they're expressing it.

So, as I looked deeper into candor, I then started to formalize it in my own mind and looked at it from four different perspectives -- directional perspectives in a single taxonomy. That taxonomy included the typical form of candor, which is from subordinate to senior, where everyone would say a subordinate has to clue in a senior on what may be something that's an unsavory topic. The second form being from senior to subordinate, where we see that relationship bore out in evaluations, counseling, and hopefully in mentorship too where a senior is able to provide candor to a subordinate.

Peer candor, not as much talked about, but as you can see, Mr. Ricks again covered that topic, but peer candor tends to only arise in relationships that have a deeper form of relationship where that value is engrained.

The Army has recently introduced a Multi-Source Assessment Feedback, where we do it mechanically now, but nonetheless, peer feedback is now a part of what we do.

And then, finally, self candor, which I believe is the wellspring of the other forms of candor, does the person have an understanding within themselves of what their true intentions, feelings, motivations, ideas are, is they can express that properly in the other three different forms of candor.

When I started to look at candor, I then tried to determine, specifically from the Army's perspective, where does the Army currently stand on it? I ran across Secretary Gates' quote, and I'll read it exactly as he wrote it. "If as an officer one does not tell blunt truths or create an environment where candor is encouraged, then they have done themselves and the institution a disservice."

I can't say it any better. So, as we look at Army literature and go back to the mid-1980s, candor played a role. It was a part of our individual values, which were commitment, competence, courage, and candor. It was an individual value, spoken about throughout the profession, and discussed and inculcated into what we believed as individual Army values.

In the 1990s, the Army shifted to the Seven Army Values, of which candor is not one of them right now, and what I believe is, because of the shift to the new Army values, candor has dropped from the intellectual discourse and it has dropped from the professional discourse, and it's actually dropped from the training model where we actually exhibit candor throughout what we do, and then people understand that it's valued and inculcated throughout our profession.

In 2010, then General Dempsey, the TRADOC commander, commissioned the Profession of Arms Report. It was a step forward for our profession in the Army and it had an opportunity to move candor forward, but unfortunately, it still was a sideline issue. And then in 2012, the Army recently published ADP-1, Army Doctrinal Publication 1 where we discuss the Army as a profession with five different essential characteristics: trust, military expertise, honorable service, esprit de corps, and stewardship of the profession, trust being the keystone and the bedrock, where all the others sort of form on that central subject.

But in my opinion, you can't have trust if you don't have candor between people and you don't have candor between organizations and the United States Army.

So, I looked at two examples, one of them being the reserve components and how the reserve components shifted from a strategic reserve to an operational reserve, and with that came a drastic change in the way that the reserve components were included in the fight. And as we saw this in the last 12 years, it became a very big change for the reserve components.

Let me make it clear here. My intent as a former National Guardsman and a former Reservist is not a critique on the reserve components, it is a representation of where our reserve components are today and how we represent that to the joint community and the national security community and their capabilities therein. So, that would include things like leader development, training, equipping, all of those things that involve a deployed force as a part of a combat force and a part of the organizations that I had where they existed in 50 to 60 percent of my deployed combat force.

I would say there are shortcomings, places where the reserve components need significant improvement, but it is not represented in those terms. It's normally represented from a position of patriotism and from one where we deeply value what our reserve components do, because they should be. I mean, frankly, without them, we could not conduct our current operations. And, in fact, in the Air National Guard, they're an essential component of all the Air Force, but I'm not going into the Air Force here.

The intent here is to try to make sure that the position of the National Guard, the position of the Army Reserve is represented with candor so that all can understand exactly where their capabilities are and where there may be shortfalls.

The second point I bring up is counseling and evaluations in the United States Army. The lack of candor permeates evaluations and counseling and I think Mr. Ricks would definitely concur with some of the points that he brought up originally in his book and some of the points that I have in my paper.

There are rare examples of counseling that's of quality and where, with laser like precision, details an officer or an NCO's potential, but I would tell you I call the new way we write evaluations "the spectrum of praise", where it goes from faint to effusive and somewhere in between is where an officer or an NCO has their evaluation painted that does not, in many occasions, represent the truth in which I call "the candor chasm", the difference between reality and where the officer or NCO currently stands.

Now, I also concur with Mr. Ricks -- Mr. Ricks actually introduced a good portion of what I had here -- that we have corporate movements that have moved at light speed ahead of where the Army is right now. Now, obviously, we were very busy in the last 12 years fighting two wars, but corporate culture has moved forward with regard to transparency and has actually done a very good job in the way that transparency and candor are valued, and I won't go into that, but I would tell you that Jack Welch and many other authors up to this point have done a simply stupendous job at revealing where transparency and candor can increase the efficiency of an organization. I believe we can have that in the Army too.

In reviving candor, I believe that we've got an opportunity, just as we did post-Vietnam, to look at the organization and present an opportunity that will take a decade to reinvigorate candor inside the Army. It starts by, number one, a recommendation as a cultural shift from three- and four-star leaders, starting with the Chief of Staff of the Army, Vice-Chief of Staff of the Army, and Sergeant Major of the Army, to be able to look at how they value candor and how they expect it inside the United States Army, present it from their perspective in small groups, and increasing the aperture so that it then permeates and resonates throughout the whole Army.

And everyone knows that two-star commanders quickly understand what's on the Vice and the Chief's agenda of important topics that then permeates battalions and brigades, the operational portion of where our Army works. Non-commissioned officer development opportunities and then officer development opportunities quickly follow, and then it resonates throughout the whole Army.

So, I believe that a wellspring has to start at the senior levels, permeate down, and then work throughout the organization.

One of the quickest ways, my point number two, of inculcating that is through revisiting the Army values. Although I recognize there's a pneumonic there that seems sacrosanct, I believe it should be changed so that candor is now a part of the Seven Army Values, or whatever number of Army values the Army wants to proceed forward with.

It would involve an open dialogue so leaders can then discuss the issue and have it reinforced because candor now becomes a more important subject and reinforced throughout our culture. And then, finally, the education and training is essential. It has to start at officer and NCO development programs, from earliest accession, from cadet programs, and through the Warrior Leader course inside the United States Army. So, throughout that environment, NCOs and officers understand, it's something that's inculcated, developed, valued, and then practiced throughout the profession so that candor is transportable throughout the Army and it becomes a part of the Army DNA that everyone understands, that soldiers, whether they're non-commissioned officers or officers, speak forthrightly and directly to each other and to national leaders. Thank you.

LIEUTENANT GENERAL DUBIK: Thanks, Paul. Okay, Scott?

COMMANDER FARR: Well, my paper was born of the 2011 statistics within the Navy of 22 commanding officers 05, 06's, being relieved of command for one reason or another. And I was curious about what was generating that, the causes of that, and how to put in something within the system within that bureaucracy that is, as Mr. Ricks said, is good at adapting buzzword, but poor at changing.

And the group that I was with up in Boston was pretty amazing. I was one of two Navy fellows. There were ten Army fellows there, which kind of shows the emphasis the service puts on education, and so I looked at the problem set and found that within any bureaucracy, one of the biggest determining factors for -- motivators for organizational behavior itself is your evaluation system. And I started taking a closer look at how the Navy evaluates its officers and I'm sure this can apply to the Marine Corps, Air Force, and Army as well.

Some of the things that Paul hit on are exactly spot on. Everybody's received their fitness report or OPR efficiency report, whatever you call it, and looked at it and said, okay, this says I'm a great guy, I live on an island and walk to work. What does this really mean?

So, it kind of leaves you wondering.

Looking at the fitness reporting system within the Navy right now, officers in the pay grade of W-02 through 06 are all graded on the same criteria. It's the very same report card. You look at, once they reach flag officer, well, they're graded on a very different set of criteria.

And when looking for the type of leaders that we're -- when we're trying to grow in the future to face the challenges that we have, you want folks who are going to be adaptive in nature and can lead vertically, diagonally, and across organizations. And one of the things that we tend to do in the military is we orient on leaders and leadership as being that person in the command position, be it the command sergeant major, the commanding officer, what have you, and we bundle leadership and authority together as one.

So, how do you disaggregate that and get the organization to value leadership, which is done at every level, whether you're an E-01 through the most senior officer, and how do you get folks to understand the limits to authority, but also the opportunities that they have in the positions of authority in which they serve? And understanding those better could possibly generate the military or Naval professional that you're looking for.

So, the long and the short of it, what I proposed was, hey, officers in the lower pay grades, W-02 through 03, generally in every service, are doing the same things. They're very technically focused in their profession. In the maritime services, Naval Service Coast Guard, you're looking at getting your qualifications, that bridge watch stander, driving your boat, getting your qualifications, flying that jet. You're also learning, hey, what that means to be a leader and learning the technical facets of the job. So, you're tactically focused and technically oriented.

Well, the report card right now is the same when you reach 04 and you go all the way through 04 through 06. Proposed changing that somewhat. The lead to 04 is where you get a cut into folks who are going to be in it for the long run or, you know, head off, segue out into civilian life and do great things there. So, when you get folks into the 04, change the report card, but also add an evaluative piece of it where you're looking at that adaptive part of it and the leadership facet of it. Does this person challenge and speak truth to authority, as Mr. Ricks said, and make them think about that decision before they do it? Are they able to not be that slimy squid talking to the Marine officer or relate to the Air Force officer in the talk as you're talking about generating a joint operation? What are you doing to better yourself professionally? Because it becomes incumbent upon you, you know, the institution isn't going to be able to better you all the time. That one-year, whether it's at War College or CGSC out on the good side of Leavenworth, if you're lucky, what are you doing outside of that to better yourself and be that finisher professional reading list, and gain a cultural understanding of the areas which are strategically important to the service that you're in, and ultimately to the nation?

And then another face of it that Mr. Ricks hit upon, when I was out on month 37 of 57 deployed in my ready room and we were solving all the world's problems, I was noting that eight out of the last ten presidential candidates had been either at Harvard or Yale, and that since 1988 the front office of our great nation has been occupied by an Ivy Leaguer, and I was very critical that those organizations did not -- didn't have ROTC on campus. And then a couple months later my detailer called me up and said, "Congratulations, you're going to Harvard", which I thought was a rather ironic thing.

So, I got to go up to Harvard and hang out with the wicked smart people in Cambridge. And it was an amazing experience, getting to look at the future of public policy in these, you know, 27 through 35-year-olds who have all been in Ivy League institutions and very, very high performing positions and them asking us questions that we would assume that they would absolutely understand implicitly, and how do we reach across the aisle, dialogue with them, and serve with them in our positions within the national security architecture to be more effective and get that level of engagement going?

But other than that, I look forward to your questions.

LIEUTENANT GENERAL DUBIK: Okay. Laura.

COMMANDER COLLINS: Thanks. Hi. Good morning. My interest and my topic stem from my last two float tours. They were separated by about six years, and in the first tour, I noticed we really weren't a very diverse crew. It was a smallish crew, but we weren't very diverse. And then six years later went back to a much larger cutter, about 160 people, and I noticed just looking around we were bout now 20 percent women and somewhere 15 to 20 percent of racial and ethnic minorities, and I thought, wow, this is really different, things have really changed over the last couple years while I was not at sea.

And my tour as an executive officer on the big cutter there really was bracketed by two very big personnel cases that I think were rooted I diversity and the nature of leading a diverse crew, the first one with a young African-American male from LA working for a senior chief petty officer from the middle of the country and I think there were some misunderstandings there, and absolutely we did the right thing, we went down the discipline route, but I could never stop thinking that some of these things were really rooted in diversity, that was why we wound up with misunderstanding in the first place.

And then my last big personnel case ended with another interesting one where it was shortly after Don't Ask, Don't Tell was removed and we had a -- it involved both a lesbian woman and then also somebody that had been the victim of sexual assault, and so really having those two big, time-consuming cases and very emotional for many of us in the crew, really led me to think, we really need to be training our leaders on how to lead diverse crews.

I received no training any different than the two cutters that I went to, and so here I was trying to make my way through leading diverse crews. So, I took an interest in it.

When I got picked up to do my RAND Fellowship, I wanted to see what RAND was doing on it, and interesting things have been going on since 2009. I learned that the Coast Guard had published a Diversity Strategic Plan in 2009 which was updated in 2010. I also learned that in 2009, Congress, as part of the NDAA, had a commission, established a Military Leadership Diversity Commission, and I want to read it because it's interesting, "to conduct a comprehensive evaluation of diversity policy and practice in the military that shape the diversity of future leaders". So, Congress, in 2009, is saying, where are our diverse military leaders? And they begin the Military Leadership Diversity Commission.

The MLDC reports out to the President in 2011, and so I'm wondering as I get to RAND, how has the Coast Guard's diversity plan that's been in place since 2009, revised in 2010, how does it compare to this 2011 document as a result of the Commission?

Also in August of 2011, you have the President sign an Executive Order establishing a coordinated government-wide initiative to promote diversity inclusion in the federal workplace and then later in 2011, the Office of Personnel Management promulgates guidance for everyone -- all the government agencies that have to do the diversity and inclusion plans.

So, now I have two governing documents to take a look at and see how's the Coast Guard's plan doing as compared to these two governing documents. And I look at it, and the Coast Guard's done pretty good, but I come up with about 20 recommendations that I think the Coast Guard needs to incorporate into the next revision of our plan to bring them into compliance both with the Office of Personnel Management and the recommendations from the MLDC. And I'll just go over one or two of those, maybe a couple, so you kind of get the flavor.

The first one I flagged sort of interesting was on our officer evaluation report. There has to be a record and an accountability there for diversity behaviors. I think 03 and above, interesting that you said 04 and above for yours, and my reasoning is in the Coast Guard, 03s are out there on the afloat units like I was and they're department heads in charge of a lot of people and they're executive officers in charge of a lot of people, and they're COs in charge of a lot of people. If you look at the lieutenants, there's one on almost all of our Coast Guard cutters in charge of those really diverse float crews.

So, I was saying I think we need to do that.

Another one coming out of OPM, we need to increase our flexibility in the workplace, some flex work policies. Mentoring is mentioned specifically in MLDC. We need to implement a formal mentoring program where we do awareness training, mentoring awareness for the people that are younger, that would be the mentees, and we need -- in our regular leadership programs we need to incorporate how to be a mentor into our leadership programs.

And MLDC recommends specifically a tracking program, feedback program, to try and see how those are doing.

Let's go over one more. One of the things I found really interesting in MLDC is the idea of diversity training, and the difference between diversity awareness training and diversity leadership training. So, coming up through the Coast Guard, ever since 1990 when I first entered the Coast Guard Academy, we had human relations awareness training, and this is about, hey, what -- you know, some basic social skills, awareness of the different types of diversity you might have in the workplace, but now it's 2012 and we're realizing we really need to train our leaders, give them skills, give them ideas on how to lead a diverse workforce.

So, I thought that was a really interesting point and I'm going to give you a little more on that.

So, now, in my project I've done this comparison, come up with about 20 recommendations I think the Coast Guard needs to do to their Diversity Strategic Plan to bring it into compliance with those two guiding documents. I say, well, what's next? As I'm reading those two guiding documents, I'm wondering about this training some more, like, well, what can we do, what can we tell our leaders, how can you lead a diverse workforce, and recalling my experiences struggling with the two and others that I mentioned to you.

And I looked into the literature on team performance, and it's really interesting, because in the '90s and early 2000s, people were doing academic research to try and understand, hey, are diverse teams good, do diverse teams solve problems better, and they're coming up with a very mixed bag of results. Sometimes they see homogenous teams do better, sometimes they see heterogeneous teams do better.

And then, mid 2000s to late 2000s and some really exciting stuff all the way through 2012 -- and I'll go over that one in particular -- the research focus shifts from "is diversity good?" to "how can we leverage the diversity to make it a force for good?" because, like I experienced, you just show up one day and your team is more diverse than it was a couple years ago. And so, what do you do? How do you lead that? And how do you harass that to make good things happen?

So, I'll just give you a few bullets from the research that I saw.

Homogeneous teams had small advantages for certain types of tasks, for instance, if their performance was very task-dependent. However, for complex tasks and also for ones that include meta analysis or international markets, you find that heterogeneous groups do better.

And so something -- another point emerges in the literature that's really interesting is this idea of fault lines, and a fault line can be pretty simply explained. So, if you have a group of four, and let's say you have two young women engineers and you have two older male sociologists, it's really natural -- it's a human natural tendency for the two women to sort of say, well, gosh, we're alike in gender and we're alike in our specialty and we sort of like almost gang up on the group, and vice versa with the other one, and that's called a fault line in the group.

And when groups exhibit fault lines, the research absolutely shows that those groups don't do as well as groups that don't exhibit fault lines. So, now you kind of come to this conclusion where, hey, when you put a bunch of diverse people on a team, like on a ship, and these fault lines might emerge, well, we know that's bad.

So, now what you want your leaders to do is to try to prevent the development of those fault lines, or if they do emerge, how do you mitigate them and get the team performing again? And here's where some interesting stuff emerges. Groups can be trained to shape their diversity attitudes. So, there was a study that showed after fault lines emerged, so we have groups where the fault lines have emerged, and we're going down a path, possibly, where performance is going to go down, you know, be less than they could have been, and you have that group get training on pro-diversity beliefs. So, hey, did you know that groups that have more diversity usually do better? And all the sudden, that team's performance goes better.

So, you're able to shape attitudes that influence performance.

Subordinate identities also help, and I think that's a great one for the military because we have creeds and ethos and core values have been mentioned and so one of the studies show that when there's a subordinate identity, for instance, if you just believe really strongly, hey, I'm an American and that's really important to me, you can accept the judgment, like if you go before a judge, of somebody from a different racial group on you and you accept it pretty well because you believe, hey, we're both Americans and I understand that this is good for America and, you know, I did something wrong so I accept it.

And then probably the most interesting study, one I really liked, was a study on about 500 branches of banks. It turns out bank branches are pretty diverse places, and so they did not have to do -- there was a field study, 500 bank branches, and performance results are obviously tracked by the headquarters, and then all the team did was use surveys to survey what kind of climate was at each of these bank branches.

And not surprisingly, actually, I'll start with the surprising stuff first. Pretty surprising that -- and they focused -- another interesting point on this study is they focused just on racial diversity, because there was also some thinking in the research that different types of diversity might have different impacts, so they just focused on racial diversity here.

And it turns out, when the majority group, the white majority group, thought things were fine, it did not influence performance, it was when the racial minority thought things were not great, even if they didn't verbalize it, that the bank's performance was down.

So, you can have the majority thinking, hey, we've got a good environment here, but as long as that minority doesn't think it's a good environment, the whole team's performance goes down.

And then disproportionally, if both groups, both the white majority and the racial minority, thought things were pretty good, supportive environment -- and I'll read you what it means by supportive environment -- you have an exponential, like a disproportionate increase in the performance of the bank branch. It's sort of inexplicable. They didn't expect to find that. So, when both think it's a supportive environment, you found the performance was disproportionately better than those other branches.

And so, just to close up, this is what a supportive environment is, when the employees acknowledged the end survey that the climate was one in which diverse perspectives were valued, novel thought was encouraged, and a diverse range of styles and approaches were encouraged, and an effort was made to get the opinions and thinking of the employees.

So, I think this is a really good starting point and maybe that's all we need as we explore this training idea for our leaders, is to just look at some of this literature, take some of these ideas, and, you know, for me as a leader, if I had gone in knowing, hey, I'm going to be leading a much more diverse team, and I had some of these things in my tool bag, as they say, maybe I could have helped along the performance.

The last thing I'd like to explore in my paper that I haven't done yet is just some of what I'll call, like, popular news articles. We have, like, *Diversity, Inc.* and a couple of these folks that do surveys all the time and kind of come up with the top ten diversity practices, so I'd like to do a little -- explore a little bit more of that, take a look at what, you know, Sheryl Sandberg is saying and Anne Marie Slaughter are saying and put some of that maybe for the Coast Guard to consider in their Diversity Strategic Plan.

So, thanks for listening.

LIEUTENANT GENERAL DUBIK: Great. Thank you. Well, thanks, Laura and Scott and Paul. I appreciate it. Find it pretty interesting in a town where if you talk about defense issues, you're usually talking about money or things, that all three fellows focused on people and leaders, which I think is reflective of where the real quality of the American Armed Forces lay.

So, thank you all for your research and for your remarks.

We have about 20 minutes or so for questions. Sir, first.

SPEAKER: I have a question for Colonel Paolozzi. You mentioned that when you were at Harvard, the non-military background students were not aware of subjects that I think you thought -- you said that you thought they should have been aware of and that led to your dialogue. Could you elaborate on what topics you found them lacking in -- lacking knowledge in?

COLONEL PAOLOZZI: The biggest -- well, I feel pretty uncomfortable talking about the deficiencies of Ivy League students since I'm a State University of New York graduate, so I'll -- but I'll take a swing at this one.

The challenge that I saw was an understanding of the role of the U.S. military within the national, you know, exercising national power within the United States. And, you know, you've got diplomatic, informational, military, economic, and how the tendency to look to the military, define problems in the strategic environment as technical in nature, and to look at the military as, hey, these guys are really good at what they do -- and gals -- and they can go in and do something and fix the problem.

Okay, so you go in there and fix the problem, but then there's the entire operational environment and the strategic environment around it that is unaddressed by the other facets of national power.

So, how do you employ those in conjunction with and in a more, for lack of a better word, elegant fashion? How do you improve the understanding of that facet of national power, its strengths, which are obvious, but also its limitations? And how do you complement those limitations with diplomacy and Department of State, USAID, all those other facets that can be brought to bear?

And then, within the public policy -- the funding piece of it, the resources that are apportioned to each, there was one class that I was sitting in and the professor threw up charts on how much is spent on Defense spending and that sort of thing, and it was, you know, hey, burn down Defense. Hey, we'll solve all the world's problems by zeroing out the Defense budget. Okay. You've done that. Well, now what do you turn to? And you say, well, this is actually how much money you get when you do that. Now where do you turn and how do you do that? There's got to be a balanced approach.

So, understanding the roles of those instruments of national power, specifically the military, and limitations.

LIEUTENANT GENERAL DUBIK: Could I step out of my moderator role for just a second? I teach also at -- right now, Penn State Law School and Dickinson College. And I'm surprised, as smart and as very quick as both groups of students are, I'm very surprised that the thinking that war is something greater than battles and fighting is not something that students come to school understanding, nor is it -- nor is there an understanding of the checks and balance systems and the civil-military relationships that make up the way the United States wages war, some basic civics kinds of understandings that I really expected that I did not see in either group of students.

Now, they're, again, very smart, very competent, quick on the uptake and all, but that kind of basic civics stuff was really surprising to me.

COMMANDER FARR: And if I -- could I follow up on that, sir? The, you know, the civil-military divide that they keep talking about, having the mechanism of ROTC in those institutions, which is getting resolved, which is a great thing, will help in that. When you look at when they were thrown off campus, 42 years ago now, and the suspicion that that generates, it is, you know, the classic case of scape-goating of institutions instead of people, it generates a natural suspicion.

So, anything that can be done to break down that barrier would be productive.

SPEAKER: Colonel Paolozzi, the suggestion that officers should be more candid, I mean, it's certainly great, but when it comes time to do your efficiency report, it's rarely rewarded, and, in fact, you're more likely to get "not a team player" crap and all the rest. Wouldn't we be better off establishing maybe cyber suggestion boxes backed by strong anonymizer protocols to get this job done?

COLONEL PAOLOZZI: You know, I've actually looked at this a little bit and said, how are we going to restructure evaluations so that we can look at it from a more objective perspective, because I do believe if you look at all evaluations, and it would go across services, I think everyone would agree, that we've got a little bit of a problem there.

I think the greater issue here is less about more of an anonymous perspective of providing feedback, but more of a directive level from a 360 perspective. We're using it, we've stepped toe in the water in the Army through this Multi-Source Assessment Feedback that must be completed before an officer has their evaluation completed, but now we should take it to the next step. And originally I was not an advocate for this. I didn't think it was a good idea because I thought that subordinates might not understand the hard calls that a commander might have to take to be able to lead an effective organization.

But I think our Army is talented enough and there's enough of a move inside the organization to be able to institute a 360 feedback inside the evaluations and take it well beyond where it is now.

The Army is currently reshaping the evaluation system to create one for a junior officer, one for a midgrade officer, and one for general officers, but I would tell you that I think it needs to go beyond the mechanical and look toward some of the things that you're discussing and the 360 feedback.

SPEAKER: How about a parallel suggestion box regime?

COLONEL PAOLOZZI: Well, I want to distance myself a bit from that perspective because I just don't think that an unattached perspective can just throw out ideas and then have an impact on where an officer is being evaluated. There has to be some skin in the game. I want to make sure that anybody who's providing feedback, whether a subordinate, a peer, or a senior, has an understanding and maturity to be able to present ideas. It shouldn't be simply just because you may have had a positive or negative experience with that person being evaluated.

SPEAKER: Thank you.

COLONEL PAOLOZZI: Yes, sir.

MR. REUTER: Stewart Reuter, Navy League. Sort of a question to the whole panel. I've looked at the numbers of the firings of 05's and 06's in the Navy that came around. It seems to me that other than the ones represented by the collision at sea can ruin your whole day, most of the others seem to be a zipper problem. Would the panel have any comment on that?

COMMANDER COLLINS: I think in the Pacific area, for the Coast Guard, we've had several fires of 05s and 06es for command climate. So, while I hate to see any good officer go home, it shows me we move beyond that and we're considering the whole command climate. And I can only speak for the Coast Guard.

COMMANDER FARR: Certainly, that is an issue, and that again goes towards, hey, why are you in the service and in that position, but you have to remember that this is not something new, that it has been a problem that's been plaguing humankind since -- you know, it's documented in the Bible in the Bathsheba syndrome, and when you look at that, hey, you disaggregate how these folks are fired, it's, you know, one of two things. Its professional misfortune or it is, more often than not, an authority type of issue, that being -- the problem you described being the ultimate betrayal of authority.

But there's also, you know, abuse of the authority position in the form of, you know, travel and that will get you fired pretty quick. Command climate, you know, a couple years ago a Cruiser CO out in Japan was fired. It was a female officer. She was abusive to her crew and I believe one of the charges at UCMJ was cruelty, which is a pretty significant charge.

You have to take a step back and, hey, okay, got it that this person got in this position, and one thing that I will point out is that the number of firings is about 1 percent, depending on how many are fired each year, 2 to 3, but less than 5 percent of folks are fired. That means there are a lot of folks who are leading units in a very effective manner, but those command climate issues that you bring up, taking a step back in this case that I mentioned, hey, how did this person get 05 command then 06 command and the system did not know it. It gets to what Paul said, the candor in that evaluation, you know, you've got a report card, but you've also got parts that you're being evaluated on on, you know, command climate and how you implement changes like the challenges of diversity, and so that is -- that's a pretty big deal and something you need to take into account.

You know, one of the best pieces of advice before I went into command was, you know, everybody's going to laugh at your jokes; you're not funny. When you're in a position of authority, people are going to orient around you and members of the opposite sex are going to try to break down barriers -- and then, you know, authorities, other authorities, are going to try to break down barriers and try to, perhaps, compromise you.

So, it's something that you need to take into account as you grow as a leader.

MS. KREIGER: Hi, I'm Miriam Kreiger, I'm a PhD candidate at Georgetown and a captain in the U.S. Air Force. My question is for Commander Collins. I've got two, but they're brief. The first is, is there any recognition, while you were doing your study, as to the fact that gender, race, and religion are just the superficial indicators of diversity and that, in fact, our homogeneity at the top goes quite a bit deeper in terms of very homogeneous career paths? In my service, certainly, they're not just white male GOs, but they're also all fighter pilots who have done the exact same career path.

And the second is, how do you deal with, in your project, with the -- what seems to be an inherent tension between fault lines or fault line avoidance and mentorship? Again, in the fighter culture, women are apportioned to squadrons like we're playing dodge ball, one per squadron, and so while that might reduce fault lines, it makes mentorship within a squadron almost impossible. Thank you.

COMMANDER COLLINS: So, the first one's easy. I did not explore that in my research. There is stuff out there that's been done on that. Here's why: first of all, the primary focus why I got interested, I'm a big implementer, you know, you just go to sea for eight and a half years and you love to implement. So, I wanted to give the Coast Guard, here's some quick 25 bullets, or whatever, so you can immediately update your plan.

So, that's what I was focused on. I'm definitely interested in your topic, but I also was thinking, well, maybe I could influence that by taking a step back because when -- so, taking a step back from my research, because when the women I know get together and we are chatting and we say, hey, why aren't you going on, why aren't you planning on being an 06, why aren't you planning on being an 07, in my opinion it's because of the things that these -- like the fault lines happen.

You know, it was pretty lonely on my first four ships, I've got to tell you, it was pretty lonely, and so those kinds -- recognizing those kinds of things, I think, and telling leaders that, like, hey, did you know you've only got one Hawaiian-American in your wardroom? You know, I had that once and it took me a while to realize it. And I was like, you know, bonehead, I should be the first one to realize that, and so, you know, to reach out to that person or maybe find somebody local on base to reach out to that person.

My opinion, in the research was, if I can start to bring awareness to these issues, then ultimately I think those people will try to trickle up. But that's not to say that's not a very good question and a very interesting question right now, it's just that in my choices right now I went with that.

Fault line avoidance and mentorship, there's some interesting stuff out there, not necessarily in the research realm, academic research realm, but the stuff that I want to get into and I had to like put it aside until I got through the academic research, on sponsorship versus mentorship, and that if you can tell some of these senior folks, like me, that look like me, to grab the young male, Hawaiian-American from Japanese origin guy and say, I want to be your mentor. You and I, that doesn't make sense, I know, but I still want to do it because I'm passionate about somebody like you making a go of it.

And so, again, it gets back to this idea that right now if we can spread that message to our leaders that are at the 05, 06 level, even at the 04 level, to grab the 01s and 02s and 03s and say, it doesn't make sense, but I want to sponsor you. In fact, I'm calling your next boss, I heard you got this job -- and I've done this after I read the article, it wasn't my idea, but I was like, I need to try this, you know -- and call the next boss and say, guess what, I worked with this officer before and you're getting somebody awesome, and just already setting the stage for this person I may not have thought to do that for, to do well in their next job.

And so, that concept of sponsorship is getting out there, but I agree, it is very difficult to be the onesie out of 20 or the twosie out of 50. It's just not enough to really feel like, hey, I belong here, and to get that feeling of, I belong here and I see myself being the 06 or 07.

So, that's the best I can answer, I think, the second question.

COMMANDER FARR: To follow up, the point that you made about the homogeneity at the top of -- at top of the ranks, you know, as you move up, the ducks pick ducks and, you know, within each service there's going to be a one that is the dominant. You know, within the Army, of course, the infantry, within Naval Aviation it's the F-18 guy, in the Air Force it's the fighter pilot. Marine Corps, I think, does a pretty good job of breaking down those barriers, but that's one thing that trying to address in the performance evaluation system, as it currently stands, it's very determinist in nature. You don't get those leaders who are willing to challenge intelligently upwards, lead down -- lead laterally.

So, if you're able to generate a leader that is very adaptive and be able to attack problems along an evolutionary arc and take a long game mindset, then I think you're going to see the type of leaders that we need in the future, but also, you're going to see things bubble up more.

I can speak within the Navy, you know, diversity is a big deal. Everybody's like, diversity, diversity, diversity. And you look at the Navy's diversity policy and it says we want all these different demographics as long as they're good at math and science. So, okay, great, you've got a bunch of engineers who can sit there and babysit a hot rock and a hole in the water, you know, of a submarine, but you don't have someone who is able to look across a cultural divide and go in when they're in charge of a PRT and understand the social demographic that is going on in that province in Afghanistan.

So, it's -- or certainly, they may be able to, but you want a whole bunch of different people to be able to exert that influence on the organization.

LIEUTENANT GENERAL DUBIK: Okay, we don't have much time. We have several people jumping out of their skin to ask questions, so last three questions, one, two, and three. And so ask your questions in a row, and we'll answer.

MR. ALTMAN: Hi. I'm Fred Altman. My question is for Commander Collins. You said that when you got to RAND you found these Coast Guard regulations. How effective are those regulations if you had to get to RAND to find them?

LIEUTENANT COLONEL FUNDERBURK: Thank you. Lieutenant Colonel Joe Funderburk from U.S. Army. My question is, in the course of your research, did you identify the cultural impediments from the services you each belong to that would prove to be the greatest challenge to overcome in order to implement the changes you advocate for?

SPEAKER: Scott, this goes back to your comments. Two weeks ago General McChrystal, I was at a session, and he was asked about education and he said when he went to West Point and what he would change right now is too much of a focus on engineering. We need to learn -- understand history, we need to understand culture.

Last week at the Senate Armed Services Committee, I was there with General Mattis. They call him the Warrior Monk. I said, "how many books do you now have in your library?" And he laughed and he said, "I've got seven and a half thousand, but I'm getting rid of them because I'm getting out of the service." He has talked to the same thing. Getting back to your whole thing of saying the disconnect at Harvard between the military -- how much of a disconnect that we have people in the military right now who the last book they read was the one they had to read when they went to a senior service school?

COMMANDER COLLINS: So, for the Coast Guard regs, I misspoke a little bit. I did see in 2009 when that plan came out. What I didn't know until I got to RAND, they had been revised in 2010. And, you know, are they effective? Long pause. Sort of. I think until we're talking about them, until the 05's and 06's and 07's are talking about them and how we're going to impact -- you know, we're getting it out there, we're getting all Coast Guard, all hands messages out there, but until -- you know, it's the buzz, they, hey, we're going to do this, so, yes. So, I misspoke a little. I did know about the 2009 one, but I did not know about the 2010 one. But in 2010, I was a sitting XO, so I should have known, to be honest.

Cultural impediments, the answer is, I did not do that because the MLDC report covers that really well, actually. It's great reading. You know, I think it's just -- if you do diversity, military diversity, you just Google that and it will give you the MLDC reports, but it does talk a lot about the cultural impediments. And to your last point, it talks about tracking cultural competencies in the military services because we're not doing that right now very well and that we need to do it better. So, that sort of ties together both the cultural -- you know, like the climate of the entire service and how it's -- anyway, it's talked about in MLDC and it goes very similar point in tracking cultural competency so that we can quickly adapt.

Because we have this great, you know, culture in the United States of all these different people. How can we track that and harness it and be ready to go wherever we need to go in the world? And so, MLDC and then, you know, there's a relation there.

And I just wanted to say, I think it's related to your point as well, if we're tracking cultural competencies, what you track, you know, get what you measure kind of thing, I think you're emphasizing it and I think -- anyway, I think the MLDC's a pretty good report. It's really comprehensive and really talks about, I think, where we need to go.

COMMANDER FARR: Well, to your question, I'm biased on this because I was a business major and I got a history Master's, so I like doing that. I started out as an engineer and then my -- the Lieutenant who was my mentor said to me, hey, you're a nice kid, you're not really good at engineering, so go try this.

So, in -- it's a tough question to answer, because what are you oriented to? If someone told me to go read a chemistry book, I would gag on it and be totally disinterested in it. However, you know, the general mention that -- I've flown EA6Bs for 20 years and have practiced electronic warfare. I did not grow up playing in my backyard and if you'd asked me about the electromagnetic spectrum when I started flight school I wouldn't have been able to tell you anything about it.

But that is the yard that I fell in, so you have to bloom where you're planted. It is incumbent upon us as we, as I mentioned before, train these Naval professionals and military professionals who are charged with the honor of national security that as you mature and move out of that technical, tactical focus at the lower levels, that you begin broadening yourself. And the professional reading list, the Marine Corps professional reading list is fantastic. The Navy just redid theirs. When I was doing the research for my paper I went to the Navy reading list and I clicked on the part about leadership and they were redoing it and there was nothing in there and I thought that was pretty funny.

But getting folks to engage in that level of personal development, because you've got to look at what you're doing, is critical to your professional development as an officer and a leader. So, did that answer the question for you? Okay.

COLONEL PAOLOZZI: A quick response to the question of culture, thank you. Obviously, culture comes in a couple of different varieties. The area that I looked at was the culture between the active component and the reserve components, which is a cultural stratification.

I would tell you that through our reserve components, we've done much better in the last 12 years of making sure that they are prepared for doing the same thing that the active duty is doing, but on a different rotational basis. So, the culture is better, but I would say that it needs to be significantly improved just for the simple point of representing what their capabilities are and how we can make sure that those capabilities are either addressed as being positive or need to be improved inside the Joint Force.

Second point, cultural value of whether candor is valued and looking at an organization, the Army, and understanding across the organization if speaking truth to power or speaking up is something that you really want to do inside this organization, and is candor transportable. Is it valued in one organization inside the Army and not valued in other places? That could find yourself stepping into a bear trap in a culture that doesn't value candor, so definitely from two different perspectives. Thank you.

LIEUTENANT GENERAL DUBIK: So, thank you very much, all three of you, and appreciate the perspectives and of course appreciate your service and your willingness to be among the much less than 1 percent of Americans who are willing not just to join the military, but to lead in the military and make it your career. Thank you very much.

(Applause)

MR. SHACHTMAN: It's my pleasure to introduce the 20th director of DARPA, Dr. Arati Prabhakar.

Now, Dr. Prabhakar has one of those resumes that when you look at it, it makes you feel like you've spent your entire life taking one giant, long nap on the couch. Born in Delhi and raised in Lubbock, Texas, she was the first woman to win a Ph.D. in applied physics at Cal Tech. In her early 30s, she ran one of the biggest divisions at DARPA. At age 34, she was named by President Clinton to head the 3,000-person National Institute of Standards and Technology. Then she joined U.S. Venture Partners, where she led investments in green energy firms. Until recently she chaired the Efficiency and Renewables Advisory Committee for the Department of Energy. That's pretty impressive.

But as I dug through the doctor's history something even more striking emerged to me beyond the sort of accolades and titles, which is that she always seemed to be right there right before the next big revolution in technology. Her work at DARPA in semiconductor manufacturing not only benefited the military, but allowed chips to shrink, which helped fuel the consumer electronics industry. She was a key voice in the Clinton administration as it was wrestling with what was called back then the Information Superhighway, which became the commercial Internet. And her firm made several key investments in clean technology years before the green energy boom.

And that ability to be at the right place before the right time seems like an awfully good quality to head up the nation's most important research division. It's probably also worth noting that at nearly every step -- and this is the case for all R&D directors -- is that Dr. Prabhakar had to fend off those who wanted to pare back America's technology investments in the name of budget austerity as if science and technology was some sort of gadget-laden fur coat that you could discard in lean times rather than the engine of our prosperity. And something tells me that dealing with the budget hawks at the door might come in very useful in a time like this as well.

So I'm looking forward to finding out where DARPA's next technological revolutions are going to come from. And so with that, please help me in welcoming Dr. Arati Prabhakar. (Applause)

DR. PRABHAKAR: Thank you very much, Noah. And thanks, Peter and Brookings, for the chance to be here. A very long time ago, when I first moved to Washington, D.C., right out of graduate school, I moved into the apartment building next door and my wall actually was, you know, adjacent to Brookings and I used to sort of listen to see if anything good was coming out over here. But despite that, I've never actually had a chance to be with you, so thank you for the chance to do that.

It's my pleasure to share with you today what we're doing at DARPA. I'd love to start by finding out who knows about DARPA? What do you know about DARPA? Tell me anything, go ahead.

(Crowd speaks simultaneously)

DR. PRABHAKAR: Oh, good.

SPEAKER: A peak at the future.

DR. PRABHAKAR: Okay.

SPEAKER: (inaudible) awareness.

DR. PRABHAKAR: Okay. Tell me something else quick.

SPEAKER: (inaudible) technology.

DR. PRABHAKAR: Good, all right. Good. Well, I'm glad you have those generally positive impressions. What I want to do today is tell you a little bit about who we are and where we're going.

And our story really starts with an agency that was started in 1958 in the wake of *Sputnik*. We were established to prevent the kind of strategic surprise that *Sputnik* had created at that time. And very quickly DARPA realized that the best way to prevent surprise was to create it and over five and a half decades that's what we've done, and we've done it both in terms of the pivotal early investments that ultimately lead to dramatic new military capabilities. We've also done it by making the pivotal early investments that seeded new technology revolutions.

And as you case see, you know, in many cases, navigation and the GPS arena as an example, we go in and out of areas. That's an example where we did some work literally in our very first few years, late '50s/early '60s, as people realized what was possible in terms of positioning based on satellites since there was a satellite all of a sudden to position off of. We were out of that area for a number of years. A great deal of other work got done by many other parties. We came back in many decades later to miniaturize GPS receivers, make them small enough to go into missiles, but also eventually make them small enough to show up in your iPhone. And so that day when you were walking down the street and looking at your map and you realized that the blue dot was following you and, all of a sudden, you became addicted to GPS directions and now I can't actually get anywhere without that assistance. That overnight revolution happened after many decades of stepwise investment, our work that showed what was possible and then a lot of other people turning it into real capability. And that story happened over and over and over again in many different areas.

At the bottom here you'll see many areas of broad enabling technologies with both military and commercial applications where DARPA similarly made those first few investments that showed what was possible. We're most famous for doing the work on ARPANET that led to the Internet, but that's one of many, many examples over time.

So that's our history. All those bars end today because we don't know what that future is. I'm going to tell you a little bit about what we're doing at DARPA today, but our job today is to make the investments that will lead to the next things that show up on this chart, that will turn into new revolutions for the future.

DARPA has had this impact despite the fact that we are a very small, consistent percentage of what the country invests in R&D. This chart shows you the Defense Department's investments in RDT&E, research, development, test, and evaluation. This is about a fifth of what the country spends in R&D. Today about two-thirds of United States R&D investment is made by the private sector, most of that is development as opposed to research. And then the other one-third that the country invests is a public investment of that portion, DoD, is the share, about 20 percent of the total for the country. And you can see that over many, many years, this chart, if you went back in time, you would consistently see DARPA has won that solid, consistent support over decades, a small but sizeable enough investment to do these kinds of programs that we do that start these revolutions in action.

We are the only part of this RDT&E investment that lives fully outside of the military requirements process. The rest of that investment is there to drive the things that we know we have to go do. DARPA exists to look outside of that, and that is actually a lot of the reason that we are able to have the impact that we have.

DARPA, if you look today, just to give you a quick snapshot of the agency, we're a couple of hundred government employees. About half of that group is technical program managers and then the technical leadership of the organizations augmented by an important support staff to get our job done. Our budget in 2012 was 2.8 billion. Who knows what it's going to be 2013? We're all waiting to find out here in the middle of the fiscal year.

Those funds translate into about 250 programs that we run across 5 different technology offices. All of that eventually turns into a couple of thousand contracts and other agreements. That's where our money turns into real work because those are contracts that we have with all kinds of performers across a very wide technical community. So it's every defense contract, you know, that's big and visible, but it's also a lot of small defense companies. It is companies who don't think that they're in the defense business, large and small, universities of every stripe, DoD labs, but also other labs through government and in the private sector. And we actively reach out to all of those communities, the expected and the unexpected communities. That's a key part of how we get our job done.

So I want to tell you what we're doing going forward, but everything at DARPA really begins with our mission. And I told you, you know, the core DARPA mission about creating and preventing technological surprise, strategic surprise, the kind of surprise that changes outcomes. That's really what we are aiming for in the long run.

I had a wonderful experience. After I got on board, someone gave me a copy of my position description. Has anyone ever read their position description and been motivated by it? I had this remarkable experience. In all the jobs I've ever had, public or private, I never read a position description that got my juices flowing, but this one did. Because in my position description DARPA is described as the agency that must anticipate, explore, and achieve the concepts and technology on which the nation's future deterrent and defense capabilities depend. And I thought that was just a perfect way of saying it. And when I saw that, I put my position description down and I got back to work because it was very important to get going with that mission.

You know, this is something, you could have used these words to describe DARPA's mission throughout our five and a half decades of history, so this is an enduring mission. As the word has changed, as technologies have changed, this is our mission, and that is not different today. In every era, of course, how DARPA focuses and executes on that mission does change. And so today I want to share with you how we go after the three major objectives that flow from our mission in the context of today's reality.

The three major objectives that I'll talk with you about: one is breakthrough capabilities for national security; the second is to make sure that we continue to have a highly functional, differentiated technology base in the United States because that is a key cornerstone to creating these military capabilities that we need; and then those two are obviously the external deliverables, the things we want to make sure happen outside of our own four walls, but along with that a core objective for us is to keep the DARPA engine humming and healthy, both for the job that we need to do today, but also recognizing that the world is continuing to get more complex, not less complex, and that we think the future also deserves a healthy, vibrant DARPA.

So let me start with the first component, the first objective, breakthrough national security capabilities. You know, it's 2013. We think coming through this period of two wars it's an important time to pull our heads up, to look out ahead, and to think about the national security landscape and consider what it means for our job. And, you know, we've had some very interesting discussions with a number of great speakers who've brought prospectus to us. Peter came over and joined us for one of those sessions.

What quickly emerges as an understanding that, as in many times in history, this is a very complex period. The actors on the global stage, from nation states to groups to individuals to the criminal activity that goes on, coupled with the vast variety of different threat types -- conventional threats, weapons of mass destruction increasingly available to more and more parties, now coupled with new cyber capabilities -- that creates a landscape that is complex, ever changing, dynamic, highly interlinked, and ultimately I think not highly predictable. But it creates a future that mandates that we be ready for a lot of different kinds of circumstances.

I think back to when I served at DARPA in the late '80s and early '90s. And, in fact, I think the world was quite complex then, but part of that world, of course, was this monolithic existential threat to our existence during the Cold War. And that so focused our work that in many ways we assumed that the problem was simple to understand. In a sense, it masked all the complexity that was behind. And today, you know, arguably, in some ways some of those threats have receded, but they have been replaced by a cacophony of threats and potential threats that lie ahead. And in some ways I think it can be a very confusing landscape, but that's an important signal to us about what we need to do to be prepared for the future.

The second major factor is about cost. And sequestration is the talk of the day. It will affect us as it is affecting everyone across government and across the Defense Department. It's the immediate issue. What I'm really concerned about for the long term is the question of whether we as a nation will continue to make the investments at the levels that we have in the past to meet our national security needs. I'm pretty clear that we as a nation will want and need to continue to be highly secure and safe. Not clear to me how budget allocations will fair in the face of shifting demographics, in the face of our shifting economic position globally, and shifting priorities. So I think that it's entirely possible that we face a future, long term, with much more constrained budgets to meet our security needs and yet still the obligation to do that, to serve that function for the country.

So what does all of that mean in terms of some of the approaches that we are taking at DARPA? And I'll give you some examples of programs, but just the themes in terms of how we think about investing for this future.

First and foremost, DARPA has always and will always focus on coming up with new military systems capabilities that change the game in fundamental ways. And that's not news. We'll always be committed to doing that.

Adding to that are some new themes. One of those is a recognition that even the most capable missile or the most capable new aircraft or new underwater vehicle, no single system is, by itself, a silver bullet in the kind of complex war-fighting environments that we face today and that we can see in the future. And so we are also experimenting with thinking through, with the services, thinking through how we layer multiple technology vectors together to radically change the game. And in a sense I think that's what we've done over the last generation as we reshaped war-fighting by combining our new communications technologies and networking capabilities by adding to that our stealth technologies and our UAV technologies, by learning how to fight in completely new ways that have created, I think, a tremendous advantage for us in the battlefield. But the world has seen how we operate for many years now and I think this is a great time to be thinking about that next generational step, again, not just through one silver bullet, but by how we combine those different technology vectors.

Another key notion is the one about creating adaptability. We don't know exactly what future we're going to need to be ready for when whatever comes our way. We also know that the enemy will adapt in real time in the battlefield. We have seen that in the wars that we've been in. So building adaptability into our systems to a much greater degree than what we have today is another theme in many of our programs.

And then finally, you know, I come from the bleeding-edge technology community and we are the people who love coming up with exquisite new answers to the challenges that we have today. I think that our community has tended to fall into a coma whenever people talk about affordability because it seems like that's someone else's problem and we'll just deal with it later. I think it's a time now, given the environment we face going forward, I think it's time now to call on our leading-edge technology community to look for ways to use innovation to radically change the cost equation, to come up with new solutions that change the burden of response, and come up with ideas that can be implemented for modest cost, but require significant cost to counter rather than the other way around, which is how it has so often gone. So this is another area where we are really looking for new opportunities.

So I want to give you a couple of examples. There are many, many examples in this category at DARPA, things that we're doing to get beyond the vulnerability that we face today with our reliance on GPS by developing new position navigation and timing technologies, work that we're doing in all kinds of new communications systems, but let me just focus on a couple of areas. One is cyber, obviously an area that is getting a huge amount of attention today. And like everything else that we do at DARPA, our job is not the operational job, the today job of dealing with the threat that we're facing. Many other people are working on that and I think you see -- collectively you see us across the department, across the intelligence community, and nationally trying to figure out how to operate in this new environment. DARPA's role here, as it always is, is to think outside and beyond the current set of problems and approaches and to try to imagine how we can fundamentally change the cyber landscape so that the future looks different and much more in our control. So let me share a couple of thoughts with you about that.

The first is in the cyber defense arena. And today's environment I would characterize as one in which we deal with the attacks that we face, whether it's commercial networks or COTS-based networks in the department or much more sophisticated systems. In each case we deal with the threats that come at us by seeing one, patching it, and then hoping that we fixed the problem. And, of course, we haven't because it's an endless series of reactions to a growing number of people who are able to attack our systems. So we're looking for ways to fundamentally change that, not incrementally change it, but fundamentally change it.

And if you look across a portfolio of our programs, what you'll find are ideas about trying to scale formal methods so that we can build mathematically provably secure systems or finding ways to vet the COTS technology that we do depend on for building so many of our systems to assure that we aren't exposing ourselves to vulnerabilities in the supply chain. So a whole host of different approaches, but our vision is a future in which we have a much more fundamental way of achieving a degree of cyber security rather than always being on the defensive and responding.

Similarly, we're thinking about a new future landscape in terms of cyber offense. And here I'm thinking specifically about cyber offense in a military war-fighting context. Today cyber offensive weapons are fine, handcrafted, artisan tools. Because it's a new environment, these are tools that we use only, you know, with very, very extraordinary levels of authority. It's not a decision that's taken lightly to use any of those kinds of tools.

But we've all seen the movies where, you know, kinetic effects are happening and the cyber part of that is happening in a completely interwoven way. You know, if Hollywood can imagine it, I'm pretty sure our future adversaries can imagine it. We'd like to imagine it and make it real in a way that's more powerful to our war fighters first and that's exactly what we're doing in a program called Plan X, which is a research program that starts to build the tools that can make cyber offense effects integral to war-fighting, to kinetic war.

And, you know, to me this future vision is one in which cyber offensive effects are used in a way that is as fully integrated as electronic warfare is today. And part of what that means is that when you take an action using a cyber offensive capability, you know precisely what it is that you're going to affect. You know what collateral damage will or won't be, and when you have taken that action, you're able to access battle damage and know what you actually did. Very different than the environment that we're operating in today.

And with that there are technology approaches that are built into how we're thinking about this that also will allow, will enable, a future in which we have rules of engagement that give graduated authorities to all the actors who need to be part of using these tools in an integrated fashion. So we see this future. We're building these tools and programs to try to get us there.

A very different example is work that we're doing in space. If you want to be freaked out about cost, think about space. And this is a video from the Phoenix Program, which is trying to think up radically new ways of creating new capabilities at geosynchronous orbit.

The idea is to have a satellite that is able to locate inactive, retired satellites at geo, to approach them on a cooperative basis -- all of this is ground-controlled -- and to latch on, as you'll see in a moment, to these dead satellites and, eventually, to be able to harvest from them the components that can still be reused. In particular things like large apertures, which are very expensive to get to geo, but are actually, you know, they are living a happy life in retirement. We'd like to bring them out of retirement and put them back to work.

Now, along with that harvested component, we would send up satlets -- very small payloads -- that our tender satellite would then be able to assemble into a new geo capability. And, you know, it is sort of phenomenal to think about doing this. It's something that we believe has the potential to dramatically lower the cost of bringing new capabilities to geo. Remember that it's sort of a half-a-billion-dollar undertaking to do that from scratch today, so there's a little bit of room to run there.

If we can achieve that, I think it will be very powerful. It is not trivial to be operating in space and approaching other spacecraft and in full awareness of the huge number of space policy issues that his raises.

DARPA chose to run this, when the program began, to run this as an unclassified effort and to actively engage not only the U.S. space policy community, but the global space policy community and to make this a cooperative, open process because we think this is going to be powerful, not just for us, but for global operations and spacecraft repair and reuse in the future.

Okay, so those were a couple of thoughts about our first major objective, focused on building the technologies that we believe will lead to breakthroughs in terms of military systems capabilities. Let me turn to the second part of our story, which is about the technology based in the United States that supports those big leaps forward. And here the context has a couple of components.

In the environment that we live in today, one thing I think that is still a very important factor for us to think about is the same and one thing is quite different, and both things require some new thinking about how we approach this particular area. The thing that is the same is that for many, many, many decades we've had a virtuous cycle between defense needs and investment and commercial opportunities and markets. And the semiconductor industry that I know the best is a terrific example where the need for miniaturized electronics for defense systems was, of course, what drove the very earliest work on integrated circuits. Intel Corporation's very first components that it sold were to the Defense Department and there was a time when we were 100 percent of that market.

As those innovations made new technology possible, of course, existing companies like Motorola and a whole raft of entrepreneurs saw tremendous commercial opportunities and started building what eventually has now become a $300 billion a year semiconductor industry. Through that time the Defense Department has drawn on that industrial capability and our reliance on semiconductors has continued to grow, but our share of the market has now shrunk to 1 percent of that $300 billion market. And in many ways, I think it's a fantastic partnership because we now have access to components that are reliable, much more cost-effective, widely available from companies that we know will be in business because they're there for lots of other reasons, and it's a very healthy partnership.

The flip side of it, of course, is that that business, along with virtually every other technology business, has very aggressively globalized and that is happening today at a far greater pace. And so the flip side is the vulnerability that comes with reliance on components in our sophisticated defense systems. We are reliant on semiconductor components, for example, that are made overseas and many of them actually simply cannot be made in the United States because we do not have companies that are building those components in factories here. So, two sides to the same coin.

And I think that the globalization that has happened at all levels, across the supply chain, but also in R&D and in our workforce, that's something that is not news to anybody. It's crept up on us over many decades, so there's not a news flash here, but I think it is still the case that we do not fully take that into account in the way that we think and plan build our system. So it's something that's very much on our minds.

So what is DARPA doing about all of that? A couple of themes, a couple of key approaches, as we think about our investments that lead to new technology capabilities. One is given this wide global availability of technologies; we have to make sure that we in the military are the best user on the planet of commercially available global technologies. We want to fully exploit as rapidly as we can and we want to transcend and go beyond what's possible from global sources, number one.

Number two, the future is going to be a continuing series of these kinds of massive new technology capabilities, like the Internet, like new electronics, like materials of all sorts. We benefit if we drive those technology capabilities first in the United States. Not because we're going to lock them up and keep them forever as U.S. capabilities. These businesses globalize faster than ever today, but if we are the first, we get a time advantage and that 10- or 15- or 20-year time advantage can be hugely beneficial in terms of our national security capabilities. So we go after that in a variety of ways.

We are always looking at what is bubbling in basic research that looks like it -- there's a lot bubbling in basic research. A few of those areas offer the potential for dramatic new technology capabilities. When we see that we have a long history of building a radical infrastructure, an infrastructure the goes to the root of the capability and builds the tools and the techniques and the communities that really know how to take that research and turn it into a usable technology. And along with that we find, when we demonstrate what's possible from this new research, it's really eye-opening and it starts showing the rest of the world what's possible.

So, again, a very long list of things that we're doing in this area. I'm only going to describe a couple to you, but I think they'll give you a sense of the wide range of things that are possible.

One is a program where we are enabling the integration of, first, starting with globally available 300 millimeter silicon wafer technology. This allows us to start with a platform that gives us the bleeding edge of silicon technology and the hundreds of millions of transistors and high performance that they bring. But this program adds to that the ability to integrate on top of those 300 millimeter wafers, small chips made out of highly differentiated technologies. They may be for optical functions, or RF functions. They're almost, inevitably, out of some material system that's not silicon and so it's hard to integrate into this 300 millimeter technology, but with some very sophisticated new approaches, we can actually find ways to get the best of both worlds. And this example on the bottom right is one example of that. It's a world record for a digital-to-analog converter. It's better than the best that you could do in indium phosphide or in silicon, and we get it by combining components in those two material systems.

A great example of being a rapid use of what's globally available and then adding some secret sauce that gives us a huge step forward in capability. And if you start thinking about how these kinds of components then will translate to new EW capabilities or new communications capabilities, you can start seeing the power of this.

There are a whole host of areas where we see amazing research opportunities and we begin to see what's possible as we combine many different technologies, many different research fields together. One of the most interesting is work that has arisen from our work in revolutionizing prosthetics. This program began with one of our stellar program managers, Jeff Ling. Jeff is a neurologist by training. He served in the Army for many years and as an Army doctor in the field he saw our wounded warriors who had lost limbs. And he came back to DARPA from that experience, driven to find a different way to deal with prosthetics and to create a prosthetics capability that took us far beyond what our wounded warriors have today.

He set out in this program to do a couple of things. One was pretty revolutionary, and that was to build a sophisticated robotic arm that was lightweight -- that was the weight of actually a man's arm -- but with very sophisticated control and the ability to manipulate and be highly dexterous. That was radical enough, but he said, oh, you know, the other thing we need to do is have it directly controlled by the brain, so that we can have a much more sophisticated level of control. And through a series of research activities, Jeff's programs were able to learn how to read out brain signal in a way that could control an arm. There was a lot of animal work that was done and then. Over the last year or so, we've had a couple of people who have volunteered to participate in some trials in this area.

The video I'm going to show you is from a *60 Minutes* segment on this program. The woman you're seeing here, Jan, has been a quadriplegic for over a decade. She is a hero to me because she volunteered to be a part of this program because she saw an opportunity to contribute to an effort that she thought was really meaningful for our veterans. And let me just play the video and you'll see what happened after she had -- at the point in this video she's had surgery to implant a couple of pea-sized electrodes on her brain to pick up her brain signals and you're going to see what happens after.

I'm going to try to get the mic down here so we can hear it as well.

(Video clip from *60 Minutes* shown.)

DR. PRABHAKAR: So my reaction to that was, oh, my goodness, look what's going to be possible, followed by, oh, my goodness, look what's going to be possible. And so let me finish this section of the talk by telling you a couple of things that purveyed the thinking across our programs, one triggered by the example that I just gave you, but, I think, across a lot of our programs.

Our job is to be at the leading edge of technology and as we push those frontiers we are often the first people who stumble across capabilities that open a whole raft of societal issues. I showed you just a glimpse of what's going to be possible in terms of very sophisticated brain machine control, but when we work in synthetic biology, when we work on space operations that put us close to other satellites in space, when we work on network technologies or dealing with information that leads into privacy questions, all of these are examples of places where our technologies are opening a whole raft of new challenges in terms of societal issues.

We have two jobs at DARPA when we see those kinds of situations, as we often do. One is to explore in these uncomfortable areas. This actually is our job and it's our job because we need to be doing it for our nation ahead of others. We think this is exactly -- we want to be very careful that we're not shying away from dealing with some of these uncomfortable areas. But what goes with that, also, is a responsibility for us to raise these topics and to engage the much broader community that it will take to really deal with these questions. These are inherently societal issues. They will not be solved by technologists, but I do think we have an important role in raising them and engaging a broader community and in trying to provide technology components of solutions to these kinds of challenges.

So what do we actually do? Well, first and foremost, we work very hard to understand and comply with the laws and regulations that exist. That part is fairly straightforward. Where it gets interesting is when we are in brand new territory, such as you saw in the previous video, where you can start to imagine important new capabilities, but it's not really clear how we as a society should grapple with those kinds of questions. And in those areas we are thinking through and starting to work out ways that we can reach out and be much more active in convening the kinds of conversations that will be necessary for us as a society to deal with these implications.

Another aspect that, again, pervades all of our programs, everything that we do is about showing what's possible. What we really want is to have a revolution in capability. And getting from point A to point B can be a very long and winding road, but we want to make sure that the first next step happens as we finish our program. So that happens in many different ways, but it's a deliberate, very focused effort on our part to look for that next step.

Sometimes we're building new military systems demonstrations and the next step can be a program of record in one of the services. Not always. Infrequent, but sometimes that's the next natural step. When we're working on component technologies or capabilities, sometimes those become real because, you know, a prime contractor will look for a new EW capability or a new communications or imaging capability and draw that kind of component technology in.

Other times, as we've discussed, commercialization by the companies that we have worked with. They go off and invest their own capital commercialized technologies that we can then draw from. And frequently, because the things that we do are quite early in some cases, frequently the next step is simply continued development, either publicly or privately funded. But each of those are things we pay attention to and we drive. I've just shown you here four examples of things that we have done. Each of these are projects in communications, in high resolution imagery, in bringing tablet-based applications, mobile applications to our soldiers, and then, finally, Blast Gauge, measuring traumatic brain injury and starting to get some information from that.

Each of these are fielded or are in the process of being fielded today, so we get early information. And we're delivering some real value on the short term, but each of these is the beginning of what we hope will be a transformation in capability as we start getting these technologies out into the world.

I'm going to finish quickly because I want to take a few minutes and hear your questions and comments. Let me just wrap up by telling you our thoughts about how we keep the DARPA engine going.

I was thrilled to come back to DARPA after a 19-year hiatus doing other things and to find that while the people were different and the programs were different and the world was different, that we still had a place that is highly functional, where people run to work in the morning because they have to change the world, and we have kept that precious magic about this agency. It's something, personally, that I'm very committed to making sure that we perpetuate going forward.

That story starts by hiring phenomenal program managers, people who are driven to change the world. Our technical leaders really know how to get things done, know how to project and then create a vision and make it come true. These folks are the reason the whole thing works and the rest of us spend a lot of time making sure that they are empowered to drive and to be in a place where an individual can actually make that kind of difference happen.

Around the technical staff we have a group of support functions that also are completely mission-driven. We don't always pay attention to that part of organizations, but without that highly functional support capability, our program managers would not be able to do what they do.

And then, finally, for all of DARPA to work, everything I told you is sort of what we do inside our own four walls, but really what we do is we engage a very broad technical community across all kinds of organizations. People who think that they are in DARPA's world and people that don't know that they are, we go find them.

And that's really where inspirations come from, that's where the work gets done. And ultimately the impact of our work happens when we partner with the services and other agencies to transition and to start getting these capabilities out.

Those are the core elements. If we keep all of that humming, then really what that allows us to do is to continue to build and reinforce this unique DARPA culture with a set of values that focuses on making big steps forward in capability and being willing to take the risk that is part of looking for big steps forward and, ultimately, to honor the public service of the organization and to celebrate the fact that we get to do this work that creates better futures for our country.

And that's our story about what we're doing today and how we're trying to make sure we keep the engine humming for the future. I would be thrilled to hear your questions and comments. Thanks for having me today. (Applause)

I'll start right here in the front.

SPEAKER: Do you have relations with In-Q-Tel or would you like to establish an In-Q-Tel of your own?

DR. PRABHAKAR: Let's see, do we have -- I know In-Q-Tel from my former life, but I don't think that I -- some of my folks may be interacting with them today, but I haven't had anything in recent time with them.

You know, I think In-Q-Tel was established specifically to let the intelligence community tap into the start-up world that at that time, I think, they really felt that they didn't have a channel into. DARPA does that sort of as our daily business. I don't feel the need for a new mechanism. I think it's very woven into what we already do.

SPEAKER: There's so much overlapping, things like MAZINT.

DR. PRABHAKAR: Yeah, I know, and at the program level what I find is that our program managers today, as in the old days, they are usually very well networked across government, and with the other agencies that are working in that area because that's -- you know, those are actually how we assemble the teams for the work that we do to review things, but also for transitions. So, I mean, if there's a specific contact that we should follow up on, I'd be happy to look into that, but I would guess that we have some discussions under way.

Please?

MR. MITCHELL: Thank you, Dr. Prabhakar. I'm Garret Mitchell and I write *The Mitchell Report*. I want to ask you a non-technical question.

As I was watching this and thinking about the resource that you depend on, which is these remarkable minds and the complexity that they deal with, the sometimes darkness of the work that they have to do, I'm curious whether and to what extent there is time allocated to giving these people time away, time to think about other -- I'm just kind of interested in the care and feeding of the human resource there and, A, whether that is a priority, B, how it's done and, C, particularly given that it's in a public agency context.

DR. PRABHAKAR: Yeah, well, I care a lot about the care and feeding of my organization for all of those reasons. A couple of things.

First of all, our program managers come to us for a short period of time. A typical stay is three to five years and that's part of how we stay fresh. That means that they run in the door just intent on getting something done in that time. So they tend to me very, you know, head's down, just driving to whatever it is that they think is going to change the world. So it's a little bit different environment than one in which you have a 30-year time commitment to an individual and you think about development in that fashion. Nonetheless, I think about this issue about thinking time, for example, a lot for myself and for my people.

I have to tell you a story. You know, we, along with everyone else, are dealing with really painful and silly situations that arise from sequestration. Our budgets, of course, across the board, we're talking about a 9 percent cut, as things currently stand.

And my civilian government employees will be furloughed for a day a week for the last five months of the fiscal year assuming things don't get fixed in the budget process. That's where we are today.

And I had a meeting this morning with our staff that's affected by furloughs and, you know, this is about paying bills and it's affecting people's families. They're completely clear on that. They're not happy about that, but I walked into the room and three of my program managers were talking about how they were going to be brewing up crazy new ideas on their Friday furlough day.

We know they can't work. We can't find a prohibition on thinking, so, you know, I'm sort of terrified about what's going to happen on Mondays after my guys have Friday off. But I've got to tell you what an honor it is to work in an organization where, first and foremost, people are crazed that they can't get their jobs done and then their fallback is, well, I'll just go make new trouble.

You know, this is not my idea of how to answer your question, but it tells you where people's heads are.

Please?

MR. BILSBOROUGH: Hello, Shane Bilsborough from CSIS. My question is somewhat more technical. I was wondering about the work that DARPA's done in the past and where you see it going in the future related to low observables, specifically, with reference to its ongoing -- where it is in its lifecycle vis-à-vis sort of ultra-high frequency radar and sort of other counter-stealth technology that Ukraine, Russia, and now China has implemented? Thank you.

DR. PRABHAKAR: The answer should be it's invisible. I'm not sure this is a forum where we can really talk in depth about it, but that's one of DARPA's proud legacies is stealth technology. And so, you know, we both look at what is possible in that area.

But, you know, one of the interesting things when I look at the areas where DARPA has really changed the world, stealth, GPS, and the Internet are three great examples where we have made such a huge stride forward that, in fact, our reliance on those technologies becomes a vulnerability in itself. And so we certainly think about, in each of those areas, we think about, well, how do we change the game yet again? And I'm sorry I can't give you a more specific answer than that.

MR. SHACHTMAN: We have time for one last question.

DR. PRABHAKAR: Okay. How about in the back?

MR. SCURVO: Yes, I was interested -- Anthony Scurvo. I'm a futurist and I was curious to know what you see as the developments in terms of technology forecasting and the anticipatory model that DARPA uses?

DR. PRABHAKAR: I'm not sure we have a formal answer to that question. People often ask us how do you magically come up with the programs that you do? A big part of the answer to that is a bottom-up process driven by our program managers. The reason for that is that, first of all, they are the ones who are in constant contact with both the user community that knows what the problems are, but also the technical community that sees the new possibilities. And I think it's really important to empower smart, high-potential individuals to go expose themselves to those ideas and then to synthesize where those new opportunities really could be and to craft our programs around that, partly because groupthink is great when you're trying to reduce risk and make practical, small things happen.

If you want to take big steps, you have to be willing to look at ideas that lots of people think are crazy, that do have a lot of risk associated with them. So I want individuals, in the form of our program managers, really driving that process. The rest of us exist to try to build a balanced portfolio of investments so that even though each thing that we're doing has a lot of risk, the portfolio as a whole has delivered phenomenally over five and a half decades. And I'm confident that we'll do that for the next decade as well.

Thanks so much for the chance to be here. (Applause)

MR. KANE: All right, I'm going to start kind of slowly and hopefully, my voice will entice people into the room.

I'll give you a little bit of background. We have two great speakers today on this panel. They're both visiting fellow here at Brookings, but let me start off by saying thanks to Peter for having me here and Brookings for hosting this really important conversation.

I think in a way, the purpose of our panel is to correct Tom Ricks. No, I love Tom Ricks. I loved his book. So, if you all don't know, I wrote this book, my first, *"Leading Talent,"* and I'm not active duty military. I kind of came back to this issue because a friend of mine named John Nagel got out of the army and I'm going to assume everybody here knows Nagel. I credit him with writing counterinsurgency doctrine, although I know he was many who did that. But to see him leave at 20-year point was kind of heartbreaking for me.

John hates it when I bring this up, but when we met on the debate team, he was an exchange cadet to air force. I really looked up to him, and when I got out at just the five-year point, it meant a lot to see someone had stayed in. So many of my classmates and friends had stayed in and were still serving and John served a fully 20-year career.

But having been outside and been in the private sector, I started a couple software companies. To have someone of his caliber in any organization for 20 years and effectively be middle management, it's a 1-million-person organization, the U.S. military active duty and the guy that writes the strategy that essentially wins a war is middle management after 20 years, we promoted the smart engineer to the head of engineering in some of my software companies within a couple of weeks because it was all about talent in our private sector and looking back on the military, it kind of made me snap.

So, I wrote this book really as a labor of love. It's not what I normally do. I'm an economist. I do GDP, unemployment, inflation, but fortunately, we've got a couple of people on the panel here who have been in the military, still are active duty. A great program here at Brookings to let them do some of their advanced education and really think strategically. So, let me do their bios and then we'll get officially rolling.

So, I think will be Marine Officer Lieutenant Colonel John Barnett. He's a federal executive fellow at Brookings. He served for over 20 years in the marine corps, the majority as an intelligence officer, but he served nearly 6 in recruiting and recruit training both in the U.S. and Iraq, and he's enjoyed multiple deployments to Iraq and Afghanistan, and resided for over 3 years in Japan.

So, the interesting thing is the similarities that I have with the two people on the panel.

Colonel Barnett and I are both from Michigan, both served in Japan. I haven't gotten this far, but my wife is from Japan. So, no, okay, similarities end there. But, yes, so, his experiences of being an accidental recruiter are what are going to be, I think, most interesting.

He's trained and planned with host nation military forces in Germany, Honduras, Indonesia, Jordan, South Korea, Thailand, and the United Kingdom. His assignments included a joint tour with Special Operations Command, plans officer with the Marine Expeditionary Force Command Element, and serves as the operations for the Marine Corps' top-level training organization responsible for instruction and the conduct of planning and operations.

His most recent tour was with the third recruit training battalion at Marine Corps' Recruit Depot Parris Island. He's a graduate of Central Michigan University, with a bachelor science degree in psychology and his military education includes the Amphibious Warfare School, Air Command and Staff College, and the Joint Forces Staff College.

Now, I think I'll stop and with that introduction and let Colonel Barnett give his presentation and then I'll introduce Brad. But just as a precursor, it turns out Colonel Brad Hoagland, U.S. Air Force, graduated actually one of the best classes that ever came up, class of 1990. (Laughter) Which is also coincidentally my class, but we just found that out after 20 years here.

So, anyway, Colonel Barnett, will you please start us off?

LT. COL. BARNETT: All right, good afternoon, and thanks. I think I speak for Brad and myself when we say we both appreciate you being here and taking part in this with us today.

I began my research in the fall looking primarily out of interest at the Marine Corps' plus-up, what we call the 202,000 K or 202K plus-up, which was our increase from about 180,000 personnel to about 202,000 personnel. So, as I started my research, I really realized I needed to look beyond just the Marine Corps to give a little bit of a context and look largely at what was called the DoD Grow the Force Initiative that was somewhere between 2007 for execution and planned to be finished by 2012. It really started a little bit earlier for the army and the Marine Corps. They were planning as early as the end of 2005, beginning of fiscal year 2006, but for historical purposes, it's often referred to as the DoD or the Department of Defense Grow the Force Initiative from 2007 to 2012.

I intentionally only looked at the active forces or the active components. As I conducted my research, there were some changes to both the guard and the reserve force as a result of this program, but I primarily focused just on the active force.

The intent was to collect these lessons and review some of the assumptions that might prove useful for the next time we have to grow the force and I'll discuss that at the end as I wrap it up, but for the next time we have to grow the force or increase personnel, it's a port of some type of conflict.

Throughout my research, I really wasn't looking at trying to influence the ongoing decrease or reduction in personnel that we're experiencing now. There are a couple of implications that some could from my research and say okay, maybe we shouldn't drawdown to a certain level or we at least need to take that into account, but I was really looking at just, again, collecting those lessons from how we increase personnel so we can use them the next time we have to do it.

I did review a lot of the historical manpower, what I call the title variations for every conflict. So, going back to World War II, looking at Korea, Vietnam, and a little bit more nebulous, but I also looked at the Cold War and while we didn't necessarily increase a lot, there was a little bit of a decrease after that. So, there was a variation of the active force in support of every conflict.

So, just to give that some context or some comparison, the increase for the active force within the Department of Defense was 39 percent for Vietnam, for Korea, 143 percent, and for World War II, we increased about 24-fold by about 2,400 percent and that's compared to the pre-war active duty manpower strengths. So, let's compare that to what we just went through from 2007 to 2012 for the active component, a 2.8

percent increase in personnel. Now, that number's a little misleading because the army and the Marine Corps both increase by about 16 percent for their active components, but the air force and the navy took a reduction during that same time period. So, for DoD at large, a 2.8 percent increase. Not very significant compared to the increases that we've experienced in other conflicts.

So, looking at a little bit more detail at this recent Grow the Force initiative, yes, it was only 2.8 percent, but this is the first time that we've increased in support of a conflict with an all-volunteer force. First time we've done it since the draft was ended in 1973. So, something to keep in mind.

The planning kind of began with a soft start in 2007, 2011. It really wasn't in the National Defense Authorization Act, although a midyear kind of authorization to increase the force was granted. Again, the plan was to increase it from 2007 to 2012. Both the army and the Marine Corps achieved success relatively quickly, quicker than they thought. I think they were both done by the beginning of fiscal year 2011 as far as getting to their active duty increased strengths. Now, they did this through the use of a variety of bonuses and incentives both for recruiting and for retention.

It's important to remember the purpose because I'll talk about this again as I wrap up. The purpose, the initial stated purpose of this increase or this growth in the force was to reduce the deployment to dwell ratio for those forces engaged in combat operations in Iraq and Afghanistan, and for those not familiar with the term "deployment to dwell," basically for every day that you're deployed, a day at a home was the standard for a lot of forces for a while. So, if I'm deployed for a year, I get a year at home and a lot of that's training and resting and getting ready to go back and then I go back for another year. This was looked at as a little bit too much stress on the force by the service chiefs and they wanted to really try to get to a two-to-one dwell ideally. At worst case, a 1.5

deployment to dwell ratio. So, if I'm deployed for a year, I at least get a year-and-a-half at home before I deploy again.

So, that was really the purpose of increasing the force in both the army and the Marine Corps from 2007 to 2012. We strayed a little bit from that stated purpose and I'll cover that, as well.

Now, during this most recent effort, the quality standards for both the army and the Marine Corps, while they may have taken a slight dip for a short period of time at the beginning, they really weren't sacrificed in the long term as far as the recruiting quality metrics.

Now, when I talk recruiting quality metrics, it was generally talked about in the recruiting force is the education level and the entry level test scores that are achieved on the ASVAD.

There have been a lot of reports about how quality standards were sacrificed as far as moral waivers that were given and that's a bit of an esoteric discussion to get into because it doesn't necessarily mean quality has been sacrificed if somebody's chosen to give a waiver to a young man or young woman who's made a mistake at some point in their life and decided they have had some redeeming qualities and can join the service and serve. But as far as just education level and entry test scores, they really didn't sacrifice those standards.

Now, before I wrap it up, I looked at a variety of these, but I'll cover kind of the three big ones. One's an assumption and I looked at quite a few assumptions that we may derive from this effort, and then the other two are what I call legacy issues, some issues that we're going to be dealing with as we decrease the force or at least maintain the force at its current level as a result of some potential mistakes that were made, although, I think it's easier to call it a "legacy issue."

The first one, the assumption that we made derived from this, because, like I said, there's been a lot of flag waving of wow, we were really successful, we increased really quickly, didn't sacrifice our quality of standards. The assumption is that we're going to be able to do that again. Anytime we need to for a future conflict, we'll be able to just recruit the all-volunteer force relatively quickly and not have any problems. We need to keep in mind that this was only a 2.8 percent increase to the active force and really not significant.

There are a couple other recruiting variables that factor into that assumption and that's the status or the state of the civilian labor market during the time period we were recruiting. So, from 2007 to 2012, the military by comparison to other jobs available became a pretty lucrative career opportunity for some young men and women.

Then the other thing to look at is kind of the census projection, things that a lot of folks in the recruiting world look at for the next 20 or 30 years for what we usually call "qualified military-age males." We could add females into it arguably with the change allowing women in combat rules, but that projection for the last 20 to 30 years shows a steady decline in the United States for 17 to 24-year-olds that are qualified for military service for a variety of issues. So, that's the first assumption that I'll address.

The next one is kind of a legacy issue and it's hard to pinpoint exactly what the problem is other than to state this: There was absolutely no planning done during the increase for how we were going to get out of it. No planning for how are we going to decrease the force at some point and how quickly can we do that in order to shape it the proper way.

Probably a pretty big reason that that was done is because during a lot of this planning, if you look at the binders and binders of planning documents that some folks were nice enough to let me borrow, there's a lot of reference to what was called “the Long War” during the early stages of this planning.

So, back in 2005, 2006, even as late as 2007, the whole reason to grow the force, again, decrease that deployment to dwell ratio or increase the time in dwell of support in “the Long War.” So, a lot of folks stated, even one of the undersecretary of defenses responsible for personnel and his three-star service chief equivalents or counterparts in the army and the Marine Corps, they stated that they assumed that this increase would be permanent.

Now, in the context of “the Long War,” which a lot of folks were defining as a 30 to 40-year war, that would seem to make sense. Looking back at it now, probably a false assumption in that the real reason for the increase was just to support operations in Iraq and Afghanistan, and that was it.

Now, we no longer use that term “Long War.” The vernacular police have killed it along with the global war on terrorism, but I think it’s important to capture it as far as the history, which is what I’ve tried to do in my research because that explains why some of these assumptions were made in the first place.

Okay, and the final legacy issue, a couple of the folks that I’ve interviewed and talked to about said that, again, these increases were in support of reducing deployment to dwell time for some of our service members, especially those in Iraq and Afghanistan, are deploying there. We created a lot of units in both the army and the Marine Corps that were kind of “one-off units,” as they're called, or that were not directly related to modifying that deployment to dwell ratio.

A lot of cyber units that while they support those marines and service members that are deployed, they're not actually involved in the deployment to dwell issue, they're not deployed. So, cyber forces, a lot of forces in support of Special

Operations Command that are really just provided by the services recruited and provided by the services to Special Operations Command and then a lot of centers of excellence.

A couple legacy issues that they indicated with these are that some of them are immune from reduction now. So, I got to reduce the force, but I can't even touch the cyber forces or the Special Operations Command Forces. So, now I've got to reduce back to where I was before the conflicts began, but I've got units that are untouchable. And then the problem with a lot of these centers of excellence or these organizations that provide training in various things such as civil affairs and COIN, or counterinsurgency operations, is they're very rank-heavy. So, you've got a lot of mid-tier to senior-level officers and a lot of mid-tier to senior-level NCOs. So, it's difficult to get rid of them without simply just shutting down that organization entirely.

So, I'll wrap it up now by saying, again, the intent of a lot of this research was just to capture these lessons. I specifically have titled my paper *"Lessons Collected."* I don't think they'll become lessons learned until they're at least acknowledged at some point. (Laughter) And really nobody is paying a lot of attention to this right now. I've gathered binders and binders from people involved in this planning, but it's sitting in the back corner of some book shelf and they were happy to let me take it because they're not going to look at it anytime soon. They're more interested in planning the decrease or the reduction in the forces right now, but sometime in the next 2 to 15, to 10 years, I don't know when it's going to be and I won't venture to guess, we're going to need to grow the force again at some point and I think hopefully if we could dust a little bit of this off and look at it, we can turn those from lessons collected into at least lessons acknowledged.

So, thanks.

MR. KANE: Great, great stuff. Okay.

Excited to get into questions, but we'll go ahead and have a couple more talks here.

Now, I'll do a quick introduction for Colonel Brad Hoagland, U.S. Air Force, also a fellow here at Brookings. Colonel Hoagland's an air force officer with over 22 years of service. So, he's eligible to retire, but he's decided to stay and continue.

He most recently served as the director of operations for the White House Military Office. As that director, he led the Presidential Emergency Operations Center as well as the White House's Airlift Operations Divisions, which provides air transport supporting the president, vice president, first lady, cabinet members, and other senior government officials.

He's commanded the C-130 Squadron in Little Rock, Arkansas, and in Balad, Iraq, and has served as headquarters U.S. Air Force's, Europe's -- sorry, chief C-130 evaluator pilot at HQ Air Mobility Command's C-130 programming officer and executive officer to the director of Plans and Programs and the chief of Airman Development for HQ Air Mobility Command's director to manpower and personnel. So, kind of perfect background to talk about personnel issues with the air force.

He's going to talk about just an absolutely fascinating topic that my eyes were open to at Peter Singer's article and then book, and here's a man who's actually lived this and seen it from the inside. So, let me just wrap up.

Colonel Hoagland's a command pilot with over 3,400 hours in the T-37, 38, T-1A, and the C-130. He's also had 298 combat hours in support of Operations Joint Endeavor, Joint Forge, Allied Force, and Enduring Freedom.

So, Colonel Hoagland.

COL. HOAGLAND: All right, thanks, Tim, and a former classmate, mighty '90 shout out for those it can appeal to.

First of all, thanks, Tim, for coming out and first, I want to dispel any rumors. I'm not going to talk about drones, I'm not going to talk about integration of UAS into the national airspace; I'm not going to talk about the Distinguished Warfare Medal or PTSD for drone pilots. There is so much being written about that already today or in the news every day about this, that I decided throughout the course of this year to try and pick a topic that no one's writing about and maybe add a little bit to the public debate and discussion about hey, where are we going as an air force, as a culture of air mightiness, and are we doing the right thing to identify, screen, train, and grow these future leaders that are flying these things called RPA, Remotely Piloted Aircraft, for the air force?

So, that's what I attempted to do with tutelage of Pete, and Noah, and some other folks that really know the ins and outs of drones and where we're going in this technology and what the FAA is doing to kind of integrate all this with safety, security, privacy issues. So, throw all that on the table, I'll talk some questions afterwards, if you'd like, but I'd really like to look at the personnel side of this and what we're doing as an air force.

So, first of all, I started my research and I tried to look at as we grew this requirement and the SecDef directed us to grow these common air patrols to provide this capability for our nation, it happened really fast, and it happened in the mid-2000s and we're still growing and we still haven't caught up with it.

Currently, we're at about 61 combat air patrols throughout the world and still growing to about 65 combat air patrols by about May of 2014. The platforms are coming, the manpower is a little bit behind and the personnel are behind where we're at. And what has happened is that some of the folks that have been identified to go fly these unmanned aircraft weren't volunteers, didn't know what they're getting themselves into it and probably weren't trained properly for initially.

So, two things that have kind of surfaced that I tried to peel the onion back on a little bit is just looking at the RPA career field. Currently right now, currently, as they go through initial flight screening in Colorado, these are unmanned pilots that go through manned flight school flying the Diamond DA20 to get their pilot's certificate so they can control these in controlled airspace, the FAA. They're still treating or washing out of initial flight screening at three times the rate of a traditional pilot. That number was as high as 44, 45 percent about a year-and-a-half ago and then the air force said hey, we're going to add a couple more sorties, give them a little bit more training, and then maybe that'll fix it. Well, we're still sitting about 32 percent attrition rate just to get through pre-solo training. So, I think we can do a better job and what I'll do is provide some comments as what I think we can do to have more of a pragmatic approach to make sure we're identifying the right folks for that.

The second issue that I unearthed is getting a little bit more attention through Congress through the National Defense Authorization Act of 2013 is that these RPA pilots, initial congregate that came through were being promoted to the rank of major from captain at 13 percent less than their peers in the air force. So, tried to glean some of the lessons learned from that and what we can do to maybe better identify and professionally develop these future aviators and leaders.

So, with that, the first problem I notice is it's not really identifying the right aviators that are going to be the future or RPA unmanned aviators for these systems. And two things kind of jumped out at me is, and it gets kind of technical, a lot of data-driven, so, bear with me.

The first thing is that right now, there's not a prescreening tool that's being implemented for the air force to look at some of the neurological or the psychological differences of what an unmanned pilot brings to the table, what are the skillsets that is required of him or her to fly these systems? A lot of tests have been done through the 711th Human Performance Wing at Wright-Patterson Air Force Base and air force research labs as well as the air force chief scientists at MIT, acknowledging that the folks that fly these systems, they are different, they are wired differently. Our current generation of kids going through junior high and high school have more hands-on interaction, more gaming with Xbox and systems like that and Nintendo and Wii and well, I know all my kids do. And what's happening is that they have a different skill set of collaboration, of cognitive abilities and aptitude to learn as well as multitasking dimensions. The air force has been collecting this data since 1994, as they prescreened medically to make sure that you're qualified to be a pilot in the air force, it hasn't been incorporated into the accessions process and the placement into the different types of aircraft.

The other thing that I've realized is that as you go through all the commissioning sources, whether it's the air force academy, ROTC, or officer training school, is that there's a board order of merit from A to Z, 1 to 100, everyone is ranked based on their performance, but that performance is based -- for example, at the air force academy, 60 percent is based on your grade point average, 30 percent on your military point average, and the other 10 percent on your physical education. Nowhere in there does it take into account maybe what your aptitude is to actually fly an airplane or some of the airmanship programs that the academy espouses are topnotch in this world.

So, what the air force has done is they've put together some methodologies called the Pilot Candidate Scoring Method and they try to take an objective view of these things. Well, it's interesting of all the commissioning sources, the only one that doesn't comply with this, is the air force academy because of the airmanship programs that exist there and these airmanship programs are everything from jump school to soaring of gliders as well as the new program that just stood up a couple years ago, which is the Unmanned Aircraft Systems Program, which is trying to really orient or expose the cadets to hey, here's a new system of systems and right now, it's having very strategic level impacts and effects for our air force and for our nation. But what has happened is that when I was a cadet, when Tim was a cadet, and some other cadets that I see, going through soaring training or glider training was a prerequisite, you must do it, you must pass this before you go off to flight school, and then you go off to initial flight screening and at T-41 aircraft.

So, what has happened now is the current culture, the academy is these are all volunteer programs. Everyone, if you don't want to take an airmanship program, you don't have to, and what has happened over the last couple of years, at least the last three graduating classes, up to 18 percent of the cadets kind of opted out and said I don't want to do this. I'm too busy, academics are too busy, everything else that the dean of faculty is pushing on us, we don't have time to do this. So, what has happened is even these academy cadets had the opportunity to do this training, aren't doing the training, go to initial flight screening, and wash out still at a 32 percent rate. I think more can be done to make this a prerequisite that everyone who is going to go to flight school does the soaring program and if you're rated medically to fly, you should also be doing the UAS Program, as well.

Currently another thing that I kind of unearthed is kind of an admissions issue, looking through ROTC and the academy, and I'll point at the academy again is that what has happened over the last three years, the number of pilot-qualified cadets has decreased from 54 percent per year to 45 percent.

So, right now, there are only 479 cadets who are actually pilot-qualified to go to flight school when the requirement is 505. That doesn't take into account all the other rated specialties of air battle managers or communication systems operators or even RPA pilots, which is another requirement of about 50. So, right now, we're inherently in a bathtub just based on the admissions of who's actually coming into the academy. So, returning to ROTC, returning to OTS for folks that don't have those airmanship opportunities who, actually, ROTC has the highest attrition rate going through initial flight screening.

So, with that, I think there are some things that we can do pragmatically to improve this.

So, first of all, some of my recommendations on this and then I'll get into the promotions piece is we need to include the neurological and the psychological prescreening data criteria into the assessment for pilot training. We need to standardize the Pilot Candidate Scoring Method or the PCSM score for all commissioning sources and establish that baseline to include the air force academy, mandate that all cadets at the academy go through the Soaring Program as well as the Unmanned Aircraft System Program and for those coming from ROTC and OTS, to bring them and their similar programs to the academy and take advantage of those opportunities that they have there.

And also there's a new program that's being built right now. It should be operational by December of this year is an irregular warfare laboratory that Colonel John McCurdy has stood up and what it's doing is their bringing in Raven and Wasp small UAS to the academy for hands-on training to get exposure to these systems, let the cadets feel, touch, operate these things, and at the same time, they're building command and control elements that have reach backs capability to understand what it's like to deploy these systems and then do the data analysis on the backend to see how the entire command control system works with the sensors all the way back to the data analysis.

So, right now, it's not resourced, it's not funded, but this is a great opportunity to be able to influence the future generations of our aviators.

And then the last thing, I'm not going to advocate it right now, but more of a last resort if we can't get the attrition rates under control is to maybe look at the marine corps, what they do with their quality spread as opposed to just doing a board order merit 1 through 100 is that you go into cortiles or you go into thirds and you spread out your talent across those thirds and you give people a top talent just because you're a pilot, you may not want to be an F-16 pilot, you may get put into another career path based on pilot qualifications.

Not very popular in the air force to do that because a lot of people still want to fly a 35, fly a 16, fly fixed-wing, so, that's why I'm not advocating this initially, but if we can't fix the attrition rate, I think it's something we need to look at and maybe pilot study.

So, the second problem I looked at was the promotion rates and as I alluded to, right now, promotion rate from captain to major is about 91 percent. Within the RPA community, right now, it's at 78 percent, and that's a 5-year look back.

This got brought to the attention of the legislators; it's primarily Senator Reid in Nevada, because Creech Air Force Base has the preponderance of our assets and people there. So, in September 2012, he highlighted this and I'll quote him. He said "Given the extent to which we increasingly depend on RPA personnel to conduct military missions of strategic importance to our nation, we believe that we must take rapid and proactive steps to ensure that these personnel are rewarded rather than disadvantaged for their choice career paths."

So, what has followed since then is Congress last latched onto this in (inaudible) 2013 told the air force hey, report back to us and why this has happened. So, July timeframe, the air force will report back to Congress on that and also an ongoing GAO report is being looked at to try at what are some of these causal factors.

So, a couple of the causal factors may appear obvious, some not so obvious, but myself as a C-130 squadron commander back in 2008, I remember getting the e-mail and a tasker that said we need 8 people from C-130 base at Little Rock, they need to leave in 2 months, and they're going to go start RPA training. Period, dot, that’s all we received.

So, I’m deployed to Balad at the time and have seven different squadrons under my command, so, I’m working with the garrison commanders at Little Rock, trying to figure out how do we rack and stack all these pilots, who should be going, who shouldn't be going? So, the eight slots we got at Little Rock, we had one volunteer because he wanted to go to California. Knew nothing about Global Hawk, just wanted to go to California. Ended up going to California. The other seven, we had to convince to be volunteers because we weren't going to non-vol people to RPA.

So, as we went through the methodology, natural human beings as we are, we did not go through and see here's my top pilots in the C-130 community, my best instructors and evaluators and weapons officers. I’m not letting them go, I’m not going to recommend them to this community I know nothing about.

The air force didn’t do a good job of strategic messaging this and we sent people that had quality of force issues, physical fitness issues, weren't passing their fitness test, hadn't completed some of their professional military education on their own or the advanced academic degrees, that’s what we send. All the weapon systems are what they send. Some worse than others.

I must admit the C-130s weren't the worst, there were others that did worse, but what happened, that was 2008. These were captains, senior captains. They ended up being that five-year look-back of why promotion rates were 13 percent below. We tried to keep up with the requirement to grow RPA, we couldn't, and we just threw people at it and said we'll train as many people as we can and try and see what happens after that.

Well, what has happened is you really hurt some people's careers and did a disservice to them, so, I think we need to as we go forward not relearn this, is make sure that we deliberately identify the right people for this career path and look at their skill sets. Like I talked before, some people are more apt to flying RPA than fixed-wing.

One anecdote that I'll share, and I was going to save this for later, but I think it's appropriate now is that there's a self-actualization that's going on within the RPA community. So, these pilots that were deemed to go fly RPA, initially, there were about 487 airman that were flying traditional major weapon systems from F-16 to C-130 to C-17 to tankers and they went and flew RPA for 3 years. What has happened is that those 487, all 487 were authorized to come back to fixed-wing manned aircraft. Four hundred twelve of them said no, thank you, air force, we're going to stay RPA, we love what we're doing, this is a great career path and career field, and we're going to stick with it. Another 244 pilots between fiscal year 2009 and fiscal year 2011 went to undergraduate pilot training for a year and as opposed to going to a traditional manned aircraft, they went straight to RPA. Of those 244 that were guaranteed to come back to fixed-wing, 25 percent decided to stay RPA.

So, those are the current folks within the last year that had the option to go back to fixed-wing manned aircraft, have seen some of the effects of where the community's going, where it's growing, going and growing, and they're very excited about where it's at. We're kind of on the cusp of trying to identify some of the stronger leaders and inject some strong leaders into this.

One piece is information is that a lot of the senior leaders at the 06 level have been injected into this community at the very high level. To date, there is only 41 colonels in the air force that have every flown an unmanned aircraft system on RPA. And of those 41, 15 have been promoted below the zone.

So, the air force has identified and say hey, key leaders, we need to build some breadth of experience, understand that strategic environment, anything from F-16 to helicopter pilots have been thrown into this at the colonel level and now the last general officer promotion was 2 of the new generals actually were commanding wings for RPA. So, it’s starting deliberately at the higher levels, at the colonel levels, but this summer will be the first year we’ve actually grown a captain who started out as an RPA pilot who’s actually going to be a squadron commander. So, that’s the first time that it’s happening.

What I think we can do is more deliberately grow the force and not look at just the bottom, what's left over that goes to the RPA community. It’s not the bottom third that from the air force academy that goes to RPA, it’s not what's left over, but really deliberately look and target those folks.

So, with that, my final comment is that we need to have a better recruiting strategy within the accessions process and at the academies, we need a better strategic communications plan and a more grassroots approach, hands-on training to expose the younger generation of future aviators in our air force, our future leaders so that as Tom Rick said, we don’t end up with a service, a future 10 years now where our chief of staff is a robot. (Laughter)

Thank you.

MR. KANE: Thanks. Thanks, Brad.

Okay, so, Peter asked me to spend a little bit of time since our third speaker didn't come to give a short presentation on my book, which is much more of a big picture, but it's heartening to hear men who've actually worked on these issues being reflected.

So, some people have asked, Tim, you've got out after a brief five years, I served in the intel community, why should we listen to you? Well, this book isn't really about me or even by me; it was based on a survey I did of 250 West Point grads. It's funny because I wanted to do a survey on the army bureaucracy and I thought I would go to the Army War College and survey some students there, but doing a survey on the army bureaucracy, you needed approved by the army bureaucracy, and I ran into some problems. (Laughter)

So, I just went to West Point class presidents and clean, they didn't know what they were doing; it was about leadership, got 250 respondents and just really impressive results. Harvard, a couple of grad students at Harvard did a follow-up study; exact same results are coming out of ROTC and OTS.

But let me start with two, little anecdotes. One is I got to know Attorney General Ed Meese a few years ago and, well, he talked about President Reagan, and Reagan was great at telling stories and there were two or three of his favorite stories. One I'm going to pass on and I think in a way, it's an inspiration for this.

So, Reagan liked to talk about the Soviet Union and use humor to illustrate the difference between our way of doing things and the Soviet way of doing things. So, the story is this: A commissar from Moscow goes out to one of the villages and to meet the mayor and he's doing an accounting of the agriculture for the year. He's from Gosplan, that's the central planning agency that organizes the Soviet economy. So, he talks to the mayor and he gets a tour and says well, how's the crop been this year and the mayor says oh, commissar, it's been fabulous. We've gathered so many potatoes, the silos are overflowing. In fact, they're stacked so high, they're tickling the toes of God. And the commissar said well, we follow the views of Marx and communism and I'm sure, comrade, you know there is no God. And the mayor says oh, that's okay, commissar, there are no potatoes either. (Laughter)

These are the games we play. When we think we've got a system that's in control and yet we all put on a face that everything is working when it's not working. The personnel system in the military, I thought it was a little dysfunctional when I was in. Thank God for the good commanders that we had that made sense of it, but it's not okay, it's in splinters, it's broken. Tom Ricks is 110 percent right on that.

What I was surprised with and I can't believe Tom is still saying this is we need to have a draft again. So, again, turn to the survey in the back of this book. I couldn't get a mainstream publisher to publish this. It has been successful. It's in its second printing and its second month already, which is great, but I think the first printing was like 200 copies. So, it's not that big a deal. (Laughter)

The survey respondents when we asked why are the best and brightest leaving or more importantly, why are the best and brightest who are staying so frustrated, because there's a talent bleed inside the military where the right people aren't being matched with the jobs. The survey said that the reasons that a lot of these things are going wrong isn't the two wars that we're involved in or high OPTEMPO, the top four were personnel things: controlling your career, compensation, promotions, career management, and I'm going to forget one. Evaluations. You talk about candor and evaluations; they really don't belong in the same sentence. Military evaluations have become so great inflated, so dysfunctional, and we all know well, we keep playing the game, we keep pretending that the silos are full of potatoes.

But the survey also asked what are some of the solutions, and that's where the book talks about a total volunteer force. Eighty-five percent of the military strongly opposed to going back to conscription. We don't want to go backwards toward a more coercive system. What the people want, even those who've ironically called for a return to the draft have said we're using too much coercion as it is. We need to go to a more volunteerism, away from just an all-volunteer force to an all-volunteer force.

Now, the good news is we've done this before. Things are actually getting better and I'm confident even though I propose some radical reforms that we'll get to a total volunteer force.

The compensation system we have right now, for example, some people think that what I'm calling for is more money because I want to use market principles and where services are based on service and duty and there's a clash of values here and they're not about coercion anymore and I brought up what about the 20-year retirement? I mean, why is there a 20-year retirement if it's not coercing people to serve? Having a cliff on your retirement benefits in the private sector that's longer than seven-and-a-half years is illegal. Why does the military do it? Why not just end it tomorrow if we don't believe we need coercion? Let people at the 18, 19-year point stay voluntarily for that 20th year or 21st year. Because the wheels would come off, because it's an all-volunteer force for that first day, but on day two, we're still back into something that goes back thousands of years, which is we just think you have to manage military personnel like slaves because that's originally what they were thousands of years ago and I think experience tells us that we can rely on their duty to volunteer to go to war, you could rely on their volunteerism to choose assignments that are going to war.

So, we can get into some of the particulars of what's broken, how to fix it, how you can use volunteerism. Let me see, I had some highlights here. But I think that's it at least to get us started.

I'll close on one last thought experiment. In a way, I'm not proposing something that's a radical change and I don't think any of the two officers on my panel are either. Sometimes when we look back at history like Tom Ricks did, the wheels came off, but they used to be on. And when I think of the great leaders in our military's history, which of them could make general today?

George Washington served for four years in the French and Indian War and then he left. You can't leave and come back in now. He left for 16 years, was an entrepreneur and a tobacco farmer and then he essentially became the sync for the Revolutionary War.

Dwight Eisenhower, could he be a general today? He was a staff officer his whole year, not operations, not muddy boot until his assignment as supreme allied commander, and I laugh. I don't think he would have been supreme allied commander for even two years. They would have rotated him out to give someone else a turn.

Mayhan, great strategist. No, he wouldn't have been a senior strategist, not in uniform.

Jim Gavin, too young. Nimitz, Nimitz crashed a destroyed long before he got his fifth star. He would have not made promotion, not made rank in today's navy.

So, it affects all the services. The solutions are some ways to look back at the adaptive, flexible military we used to have and to move forward, inch away from coercion.

To Tom's point, to get to that reform, I don't think it'll happen, even with everybody in this room rowing in the same direction, which I think we'll test that thesis in a minute. It's going to take President Obama and the secretary of defense to appoint second Gate's Commission. It took a Gate's Commission to get out of the draft and into the all-volunteer force, but we've done it before, we've reformed before, it was controversial at the time, but trusting on the patriotism of the men and women to join that they'll be high-quality people, we've proved it once. I think it will prove true again.

So, with that, I think we'll get into a Q and A session for maybe 15 minutes and thank you. So, I'll open it up now to questions. Yes? And let us know your name and also who the question's directed to.

CAPTAIN KRIEGER: Hi, Maryann Krieger, captain, U.S. Air Force.

This is for the two zoomies on the panel. How do I go to my chief of staff and tell him sir, we all know that the system is broken, the promotion and retention system is broken, the evaluation system is broken when we're trying to get rid of people? How do I convince him that all of the expensive and H.R.-intensive talent management and talent identification programs that we need are worth the investment?

MR. KANE: I'd just say very quickly it's to save money. The predictions where the all-volunteer force will be way more expensive than a draft, but the turnover was so high under the draft, it costs much money to keep training and training and training.

So, they saved money when they went to the ABF. They'll save money if they go to an all-volunteer force and the thing about force-shaping, Brad and I saw this with pilots, it's like every two years, they had too many, pay them to quit. They have too few, pay them to stay. They have too many.

So, the inefficiencies of not using market forces and thinking you can do central potato planning, treating people like inventory doesn't work. If you use the market and you allow pilots to volunteer for the various jobs or whatever career field that they're in and they don’t fill, then that person can separate or they can apply for a job that’s maybe not rated or a job that’s a rank down, right? So, it’s not that radical, but it’s super-efficient and actually would save money.

Brad?

COL. HOAGLAND: Yes, I’d just add to that, what Tim said is we’re very reactionary to budget cycles. I went to flight school and graduating, but I fell into that situation where 68 percent of my graduating class got banked, which means for 3 years, you're not going to fly an airplane because we had too many pilots and not enough cockpits.

It gets back to what I think Scott had said earlier this morning is kind of bloom where you're planted. Take advantage of some opportunities. I was pissed when that happened and everybody in my class was pissed and I was fortunate enough that the air force sent me to graduate school at the Air Force Institute of Technology. So, for a year-and-a-half, I got my degree, which ties into some of these other promotion issues is that a lot of folks can't get their advanced academic degrees while they're working full time taking care of a family. So, it’s kind of the gift that keeps on giving.

And then with some of the promotion things, yes, I think forms like this, academia, where we have the opportunity to do the research and provide that to our senior leadership is the best way to do that because once you get in an operational unit, it’s very difficult to try and push that up the hill. So, I’d advocate working with the Strategic Studies Group on the air staff for the air force folks. They have access to the chief and that’s who we, as senior fellows here, are working with on a day-to-day basis to try and push some of those initiatives and especially on the personnel manpower side and they have access to the A-1. You can get their through an academic environment. So, that would kind of be my recommendation there.

MR. KANE: Great, yes, sir?

MR. REUTER: Stewart Reuter, Navy League.

Question for Colonel Barnett. Do you see the downslope that you're envisioning being forced by a desire to save money rather than a change in operational requirements? And, therefore, wrong.

LT. COL. BARNETT: Yes and maybe. (Laughter) Yes, I don't think it's tied to any operational requirement, at least the way it was envisioned during planning because the Long War was looked at something that was potentially 30 years in length with a pretty defined enemy that was not limited to 1 region.

So, just ending a conflict in one country and then downsizing the force doesn't match the initial planning. It doesn't mean the plan hasn't changed since then. I'm not sure exactly what the plan is right now as far as addressing that regional threat, but I'm not sure that we won't need forces again in two or three years because we're going to be facing the same deployment to dwell ratio.

MR. KANE: Great. You, sir, and you, sir.

LT. COL. DUMAY: Hi, Lt. Col. Dumay headquarters Marine Corps.

I have a very related question. So, John, I'm putting this one towards you. As we downsize, we also hear a lot about reversibility and the attempt to maintain a capability and a capacity in the event or when we have to grow the force again later.

I was wondering if you could address that, what you've uncovered as far as when we do have to grow the force, where might we see that reversibility capability?

And, Tim, if you could possibly address the economic aspect of it or the economies of it, the market forces rather of how you might keep a reversibility factor in with the market force as you're saying.

LT. COL. BARNETT: I'm sorry, can you explain --

LT. COL. DUMAY: Reversibility, absolutely. As we downsize the military or at least shrink it to a different size, one of the concepts is the ability to maintain a certain capability or capacity at a certain level that we can very rapidly regenerate that capability or capacity whether it's moved to the reserve force, whether --

LT. COL. BARNETT: Right.

LT. COL. DUMAY: -- it's just a smaller unit that continues to train and can make more trainers later to grow that capability back.

LT. COL. BARNETT: Okay, perfect, thank you.

I mean, solely in terms of personnel, it's probably easier to factor in reversibility into your military personnel planning with the army and the Marine Corps than it is the navy and the air force. Arguably, the army and the Marine Corps are a little bit more youth-based organizations. I think the Marine Corps is probably the most youth-based of them all. And we're relying on a high level of turnover every year. We don't need everybody to stay in, so, we're putting in 40,000 every year and getting rid of 40,000 marines every year to go on and do great things as civilian marines.

So, I think looking at DoD as a whole, reversibility for the Marine Corps may be relatively easier. We can afford to get rid of some because we can generate them pretty quick because we only need them for a few years.

Other services that are slightly more technical, and I'm not saying -- I mean, you know as well as I do we're a little bit technical, but other services that are slightly more technical or more reliant on it, it's not as youth-based. They need a broader career force, so, it's hard to generate that overnight. It's the same thing that is said in Special Operations Command. You can't generate it overnight. It takes years of investment to maintain it.

LT. COL. BARNETT: I would just tell a quick story on this issue in that I think the military is stuck with this model. Some of the questions in my mind are why do we use year groups? I haven't read the great philosophical thinker that explained a system that you need year groups. We do it because it’s a management group and using year groups is the only way to solve that management problem short of using market forces, right? Why do we use silos, AFSCs or specialty codes? So, we slice and dice people into management groups of he’s 16 light infantry army officers. I can sort that. Reversibility is easy if you're not trying to grow somebody from year 1 to year 14, which is about where you think that you need that cyber major.

But I talked to an individual in Silicon Valley, former marine, served in combat, went through basic training, tough as nails, but he’s also a brainiac and he’s worked at a named Silicon Valley company was all know. He might come back into the military, but we don’t let that happen. It’s all hermitically sealed.

How are you going to be able to reverse if you lost that guy that you already invested all the money in, right? So, I think it’s an easy problem to solve, saves money, you don’t have to play this game of we’re going to career plan for 20 years. Nobody saw cyber coming, being this big and nobody saw RPAs coming to being this big when we were cadets, and, yet, we’re playing this game like we’re going to have trained them up to do these things.

So, reversibility becomes a lot more solvable if you thicken your market. And what Tom Ricks gets at when he talks why we want to draft and there's a gap between the civilian and the military worlds, well, the military has cut itself off and people leave but they can't come back in. So, that gap goes away if you allow maybe not lateral entry.

I don't want to go back to the European model where some wealthy guy buys himself a colonelship, right? But reentry of somebody who’s already been through basic training and led men and women in battle, let that officer back in if they’ve skills that finds out you did need.

MR. KANE: Sir?

COL. HOAGLAND: Yes, if I could add just add one comment there, Tim.

MR. KANE: Yes, go ahead.

COL. HOAGLAND: Is one thing that we do within the air force, more of a technical service with aviation is what's our active duty and reserve component mix to maintain that capability that’s not an active duty but still in the reserves and some of the total force initiatives that we have is try to deal with that reversibility issue. It’s not letting them go all the way out, but maintaining them so if our nation does call on us, we can mobilize, we can use volunteerism to get them back into the fight very rapidly, very quickly. So, it’s another key piece that I know the air force is grappling with Congress as to hey, what is that right force mix? When do we retire airplanes? How many should be in the guard reserves?

MR. KANE: Sorry, we’ll try to do some rapid fire answers to get in some great questions I know that are waiting out there.

Yes, sir?

COL. THOMPSON: Hi, my question is directly related to his. I’m Colonel John Thompson. I’m on the CSA Strategic Studies Group.

For Colonel Barnett, in your research, did you try to take a stab at what DoD, specifically Marine Corps and army can afford to downsize in order to lessen the effect of reversibility, thereby potentially sort of defining the military that you need during the interwar period?

LT. COL. BARNETT: I stumbled across some of what you're referencing. I didn't try to collect a lot of my research. It's being written on a lot right now by a lot of people. I mean, the question is: What do you need us to do? And I've heard that said recently by somebody very senior. How far can they reduce the army and the Marine Corps? I don't know, it depends how much you want them to deploy and what do you want them doing for the next five or six years?

If we're all just coming home from Iraq, which we already have done, and Afghanistan, and we're not deploying, I guess we could go down to 160,000 in the marine corps and maybe 300,000 in the army. How quick do you want to generate us to be able to go do something? Oh, within a month? Okay, well, then we can't do that. It would take two or three years to generate us back up to what we were at right now. So, I mean, I guess that's part of the question.

The other kind of question that he leads to is that one of a cadre army or a cadre marine corps. Do you want 10 units manned at 70 percent or would you rather just have 6 units that are 100 percent capable and that's what we're struggling with, I think as far as that mix and the hollow force.

MR. KANE: Yes?

SPEAKER: This question is for Colonel Barnett. I'm interested in the point that you made about the permanency assumption behind Grow the Force Initiative. I'm also under the impression though that some of those forces were justified as temporary end strength. I'm curious if the temporary end strength justification has come up in your research and how that jives with the permanency policy.

LT. COL. BARNETT: Well, yes, I mean, it's easy to answer by just saying that we were contradicting ourselves back in 2007 when we were referencing this entire plan at various levels. We knew it was temporary because it said it was to support deployment to dwell. Some people read that as Iraq, Afghanistan. Other people read it as the Long War. So, some people were looking at to 2014, maybe. We didn't know that back then, but maybe 2014, 2015. Some people were looking at 2040. So, that depends on well, how permanent do you think it is? I mean, that's what we were doing. And as far as all the press releases, the testimony, the public statements, and then the planning documents that I've looked at.

MR. KANE: Good. Sir, I think you've been waiting for a while, and this will be our last question, unfortunately.

SPEAKER: Okay, I'm Fred (inaudible) and I'm wondering as you're talking about re-increasing the size in the event of an emergency, given the obesity, the lack of education, the lack of physical capabilities, how does that impact increasing the force size?

LT. COL. BARNETT: I mean, right now, the impact is negligible based largely on the economy. I mean, every four years, they do a quadrennial review of military compensation. Every four years in that, they show a direct relationship between the national unemployment levels and then the quality of the force, meaning their education level and their tests scores. So, they're directly related. So, the higher the unemployment level, the better the quality is in the military because they can't get a job anywhere else, they get in the military.

So, we're experiencing that right now. Recruiting isn't necessarily the issue, but if we were to have to increase instead of by 2.8 percent the Department of Defense, we suddenly had to increase the all-volunteer force by 20 percent; we might run into a paucity of the qualified military-aged males, which is what we look at now. We look at qualified military-aged males, not females.

MR. KANE: All right, I think what we'll do is have some brief closing remarks, thoughts.

I would just say to all of you, that question is a launching point. I was really happy to hear Colonel Barnett's point about the quality of the men and women that he was seeing and recruiting.

I did a study a few years ago where I got recruit data on every individual enlistee who joined the four branches of service, didn't get to include the coast guard, and using some of these metrics like literacy and ASVAD scores, recruit quality went up after the Iraq War started. And that's a great testament, I think, to the patriotism of people.

In fact, a lot of times, this is focused on as their exploitation in our poor neighborhoods. There are three recruits from the wealthiest quintile of neighborhoods for every two from the poorest quintile. The real challenge is a lot of people just don't qualify for the military, and yet those who do qualify I think are still coming in in strong numbers. But maybe this will be obviated when we have a remote force that's not just the air force, but the navy and the army and the marines. And we need smart people. Fortunately, they're still coming in. That said, we need a more flexible system.

So, I'll close on one of the most telling survey questions I asked was: Which of the following statements do you agree and then check all that apply. Among the active-duty respondents to my survey, 18 percent agreed that the army is doing a good job weeding out the weak leaders, 5 percent good job retaining the best leaders, and those are terrible numbers. Margin of error might make that 8.

So, does a good job of matching talent with jobs, 18 percent. Does a good job promoting the right officers to general, 38 percent. I mean, that's the high water mark. For all the other things they're getting wrong, they're doing at least pretty good getting the generals up.

Should be radically reformed, 55 percent agree with that. So, there's not a hunger not just among junior officers, but among senior officers trying to manage the system that they need a better toolkit and that falls on Congress and it falls on the president and it falls on the secretary of defense. So, I hope they're watching.

Final statements.

LT. COL. BARNETT: Just in the interest of time and the fact that Brad and I did not get lunch because we couldn’t sit up here and talk and eat at the same time, just appreciate the opportunity to be here today. Thank you.

COL. HOAGLAND: And ditto what John said. It’s been a great honor to do this and as a market analyst, I’ll just throw one more thing out there about the future of UAS. There's one thing I didn’t bring up today, but is in my paper, is that market forces and future employment based on matching the right person to the right job at the right time, I think it’s key to the young generation to identify hey, when you get these skills, what are you going on the outside?

And the future of RPA and UAS is growing and there was just a release today from AUVSI that they anticipate within three years of FA integrating the airspace, the creation of about 70,000 jobs and then by 2025, another 100,000 jobs that are just supporting the UAS industry, whether it’s through law enforcement, agriculture, and some of the national resource exploration activities that are out there and coming. So, that’s the exciting thing. It’s a growth area and innovation and technology is a part of that. So, thank you.

MR. KANE: All right, so, thanks to Brookings. Please join me in thanking Colonel Barnett and Colonel Hoagland. (Applause)

MR. SHACHTMAN: So in the last couple panels we've looked at, you know, some of the personnel and organizational challenges facing the U.S. military, but to my mind at least the technological ones are in some ways even more imposing. And I'm not just talking about that weird contraption that sticks to the top of your brain and operates mechanical arms.

America's greatest technological advantages in recent decades, in particular our ability to share information in something like real time, I think it's fair to say that those are going to erode over the next few years with everybody sort of getting the same infrastructure we get. And at the same time, it may become our greatest military weakness, those systems. At the same time, you've got new additive manufacturing technologies, like 3D printing, which make America's logistical edge harder to maintain and make it tougher to keep some of the worst weapons out of the hands of some of the worst actors. And then even relatively old technologies, like nuclear weapons, are about to get a lot more complex as they proliferate and as they spread.

So here to discuss that brave new world we've got, starting on my left, Lieutenant Commander David Forman, who's a senior military fellow at the Center for a New American Security. He's a submariner by profession, serving as the executive officer on the *USS Columbus* and the engineering officer on the *USS Wyoming*.

Lieutenant Commander Michael Llenza is a naval flight officer and the U.S. Navy fellow at the Atlantic Council. He's deployed seven times to Iraq, Afghanistan, and elsewhere, logging over 160 combat sorties.

And finally, we've got Commander Joe Kramek, who is a federal executive fellow here at Brookings and most recently served as the special assistant to the commandant of the U.S. Coast Guard.

So I think, David, we're going to start with your presentation.

LCDR FORMAN: Thanks for Brookings for hosting and thanks, everybody, for sticking out here after lunch. Appreciate it.

So why am I talking about strategic deterrence today? Some of you might be thinking the Cold War's over, didn't you get the memo? But as a submarine officer my perspective's a little different, so this afternoon I hope to briefly share with you what I call the elephant in the nuclear room. So when people here in D.C. hear that I work on submarines, sometimes they often ask me boomers or fast attacks? And they're quite often surprised when I say both.

So my department (inaudible) mentioned, I was on a boomer, also known as SSBN. I was the engineering officer, so they call it "eng" for short. And part of my job there was to coordinate the ship's repairs during maintenance periods before our patrols. And so one day in the ward room the weapons officer says, Eng, we can't follow your plan today, the Russians are coming. And he said it so casually I thought he was just joking with me. I said very funny, nice try. He says, no, really, the Russians are coming.

So they had arrived for START I inspections and no ship could move its -- change its mooring area or do any missile maintenance until the Russians declared which ship they were going to inspect. So at that time I didn't focus too heavily on the policy or strategy issues in my career. My job was to get the ship ready for sea and keep it at sea, so that's what I did. But here, after this tour in the D.C. area, I'll hopefully head back to sea as a commanding officer, so as a potential future skipper I'm sure you'll understand my vested interest.

So now to talk about what I think is the elephant in the room. I think it's the general uneasiness we feel when we start to seriously look at the status of nuclear strategy since the end of the Cold War. And I think it's born of two simple points: first, that the world has changed and the role of deterrence has changed along with it; and second, that both as a nation and globally we haven't really kept pace with those changes. So I'll expand on both of those points and then offer some things to consider for the future.

But first, for the purpose of the discussion here today, I'd like to separate the specific counting of warheads and launchers from the role of strategy. They're certainly related, but the question of how much is enough is a political question I'd rather not get into.

Additionally, I need to commend the book *The Second Nuclear Age* by Paul Bracken to your reading list. I think it's the freshest thinking in this area in some time. And I do owe him my gratitude for several other points here today.

So to my first point about how the world has changed and that the role of deterrence has fundamentally changed as well. So the Cold War is obviously a reference point for deterrence. And during the Cold War it was really a two-player game obviously between us and the Soviet Union. And in a two-player game, as we often analyzed, logic held that the stronger power would win. But today, with nine nuclear powers, it could be a three- or a four-player game. And in a three-player game, just as an example, the third can watch while the other two battle it out and then blackmail or bargain from an otherwise full-strength position. And we also always tend to think that we'll be one of those players where in this case, in this world we could actually be on the sidelines, and that was not the case during the Cold War.

Another example is to take the issue of prompt global strike. That's the concept to put conventional warheads on a submarine-launched ballistic missile, or SLBM. The initial goal was to bolster our conventional capability to reduce our reliance on nuclear weapons. However, as Paul Bracken points out, China viewed this as a potential threat, so they bolstered their SLBM capability. China's action influenced India. Now they're further diversifying towards a triad. India's actions caused Pakistan to build more weapons. So if this domino theory holds, then our attempt to reduce reliance on nuclear weapons actually caused a buildup, and that was not the case during the Cold War.

Another point to consider is that today I think it's easy to say that we have, hands down, the most capable military force in the world. And with such a wide array of capable and conventional non-nuclear options, if we ever felt the need to use nuclear weapons first we'd, I think, be seen as a bully on the political stage. So all potential competitors hold a strategic advantage in this regard, and that was not the case during the Cold War.

And lastly for this point, Steven Pifer and Mike O'Hanlon and their recent book, *The Opportunity*, which I did see out on the shelves out there in the front, offer a general proposition that the fewer the number of nuclear weapons that can strike the U.S., the better American security. Now, it's an excellent book and I do encourage you to read it, but I don't necessarily agree with that point, but mainly because I don't think it's that simple. When countries have relatively few weapons, say in the tens or low hundreds. They're very sensitive, you could say hypersensitive, to any perceived threats to those weapons. So when you only have 10 and 8 of them are not ready or threatened, those last 2 become awfully important, and that wasn't the case during the Cold War either.

So now to my second point. That's the part of my metaphor here that I think I'm killing with the elephant, that we have not kept pace with the changes in the world. To begin, we're still using the language of the Cold War, though most of it doesn't really apply anymore. Just yesterday I read an article that said, and I'll quote here, "Any such action would undermine the logic of mutually assured destruction." And the author is not writing about the former Soviet Union. They were writing about North Korea here in 2013. So, hopefully, I'm not the only one in this room that wouldn't characterize North Korea's strategy as one of mutually assured destruction. However, we are short on terms to help us characterize the concepts of multiple deterrence.

As we look internationally, our main structures to deal with nuclear issues are the United Nations and the Nuclear Non-Proliferation Treaty, or NPT. Both of these obviously recognize only five of the nine nuclear states, so there's some natural friction there. And of approximately estimated 20,000 weapons globally, 19,000 of those are owned by the U.S. and Russia. So while New START provides an excellent framework for the vast majority of global weapons, it's really the other thousand weapons that I'm most concerned about. Yet we don't have very effective mechanisms to help deal with them.

On a related note, and lastly on this point, I think it's safe to say that we do not consider or treat all nuclear weapon states the same. From a policy standpoint are we going to treat each country as a unique entity or should we group them in some reasonable way? Paul Bracken offered the category of major powers, secondary powers, and groups. And if we had such a structure, we could pursue clear policies towards each and we might be more effective at discussing those thousand weapons not held by the U.S. and Russia.

So there's much more to talk about, but I want to pause and say that I'm not suggesting that nuclear weapons come to the forefront of every foreign policy and national security discussion because I know it won't happen and it doesn't need to, but I do think it needs to be considered much more than today.

So now, all military folks are people of action, so what can we do to better address modern-day deterrence? So I'll try to offer some fresh ideas for your consideration. Some of them may seem provocative, and maybe they are, but I think only through an honest and reasonable analysis can we develop new frameworks and positively influence the current state of thinking about the deterrence.

So I suspect that most of the work in this field will need to be done from think tanks or other non-government organizations as it did during the Cold War with RAND. Within the government, as we've said in other panels today, it's quite hard to overcome some of those hurdles for a genuine and fully balanced analysis. So as an example I wanted to bring up that it's difficult to talk about dealing with a nuclear Iran without looking like you're undermining the commander in chief who said that it's not going to happen.

One unfortunate issue is that think tanks do need to follow the money and I'm not sure how much money there is in nuclear strategy right now. As an example of out of the box but still plausible thinking that can come from fresh thinking outside of government, Paul Bracken offers a potential national policy of no nuclear first use; guaranteed second use. So I'll just say that one more time. No nuclear first use; guaranteed second use.

When I first read that I thought he was crazy, but notice that it says, "guaranteed second use," not guaranteed second nuclear use, which is how I interpreted it the first time I read it. So such a policy accepts the bomb's existence, but tries to lessen its usability. I think that anyone would have a hard time arguing that we don't already have a de facto no-first-use policy today and his suggested policy leaves some tough questions unanswered, but intentionally, and it supports caution.

Another issue to consider is that of the Comprehensive Test Ban Treaty. How long is too long to go without testing? It's one thing to assure Congress or the

President that our weapons will work based on advanced computer simulations, but is it enough to dissuade our enemies? So if you fast forward to 2040 or 2060 and so on, do we ever lose confidence in these weapons?

I'd offer you to consider that a submarine force launches a Trident II ballistic missile without the warhead every six months to verify all other aspects of the weapon system. Obviously warhead testing is a different story politically, but it's still a question that I think we need to answer.

And what about the web? We've had the Internet for some time, but never through a crisis. So if you could try to imagine the Cuban Missile Crisis on Twitter. So even if we get past a nuclear crisis, people can take some extreme actions in severe situations that could create its own calamities with loss of life.

So now my last point that I'll offer for the future, much of deterrence is rhetoric only. Words can change the balance of power overnight as they did when Nixon went to China in 1972, and all without moving a single weapon. We must always look at nuclear speech in the political and moral framework in which it resides. And when national leaders show their cards unnecessarily with offhand remarks, such as after a press conference and so on, without -- unnecessarily, I think we lose strategic leverage. So we have to align our deterrence message across political leaders, military leaders, and our budgets showing that we take our nuclear capabilities and the readiness seriously.

The Soviet Union used terms developed by Americans to explain their own strategy during the Cold War. So imagine if North Korea used terms today that originated in the U.S. to describe their nuclear strategy. So words matter more than ever when it comes to this field.

So, hopefully, I've made the case that along with the litany of other significant issues facing our nation, the issue of deterrence requires much more analysis than it's receiving today. I simply think that counting warheads misses the point entirely. Though we are thankfully not shooting these weapons, they are very much in use every day as they affect political, economic, and military decisions, and I think we can do a better job leveraging this tool.

And so finally, talking about deterrence and contemplating getting it wrong can get depressing very quickly, so I'll finish with a minor bit of hope that Paul Bracken was wrong in one regard. And that's, in his opinion, talking about nuclear strategy in the military today is a one-way street to a dead-end career.

So thank you very much. I look forward to your questions.

MR. SHACHTMAN: Thanks, Dave. Mike?

CDR LLENZA: Good afternoon. It's an absolute honor to be on this side of the stage here at Brookings.

So when I first arrived at the Atlantic Council back in August, they were working on the Global Trends 2030 report, which looks to predict upcoming trends about 20 years out and their possible policy implications. And part of the report dealt with disruptive technologies, and one of these technologies was 3D printing. And I immediately thought back to when I was the maintenance officer at my squadron, and I was a maintenance officer for a legacy platform that had no active production line. And I thought about all the combat sorties I had to cancelled because we didn't have parts for the jet. And I also thought about the time when I was standing in Afghanistan watching all my buddies take off in their jets and I was there with a broken one waiting for a part from Washington State. So I thought it was an incredibly interesting topic with huge implications for the service and obviously huge policy implications as well.

So I'd like to talk to you about some of the current applications and the research going into 3D printing or out of manufacturing and some possible feature implications for our service, most of which, if not all, have intrinsic policy implications. So one of the main things that make our service, the Navy, unique is our ability to forward-deploy our force and sustain operations in the blue water or the littoral, hundreds of miles from a friendly shore, thousands of feet in the air, or hundreds of feet beneath the surface. Like the rest of the services, we rely on a relatively intricate global supply chain. And with the levels of instability currently present in many of the theaters we operate in, it's all too easy to imagine a scenario where either geopolitical or even an environmental event caused us to lose an ally or a basing point, which is critical to our supply chain. And this is one of the arguments used to support seabasing because instead of relying on a larger shore-based footprint subject to regional instability, it has the potential to move a significant part of your logistical requirements closer to the fight.

So what's truly revolutionary about 3D printing is what Neil Gershenfeld from MIT's Center for Bits and Atoms calls the ability to turn things into data and then data back into things. And I think that's what has the biggest implication for the naval service because 3D printing potentially allows us to shift from a physical inventory to a digital one. And a digital inventory allows you to carry the digital designs for multiple parts vice the parts themselves, and then you end up taking up memory instead of shelves. And when you couple that with the ability to print out parts on demand at the point of use, you reduce the requirement for valuable storage space while, at the same time, increasing the number of parts you can make.

So it's, therefore, not much of a stretch to see how we could repurpose not only some of the spaces above surface combatants and submarines with this capability, but convert some of our military Sealift Command Fleet into printing ships or a combination thereof; floating factories able to take orders from the battle group and have readily available, on demand part creation capabilities to support the fleet. But even if you don’t get rid of your shore-based logistical footprint, which is the most likely scenario for the foreseeable future, the technology still has an impact by allowing you to set up a distributed global production network where you can send an e-mail with a digital scan or a design for a part you need and have it created at the nearest certified printer and then have it shipped out to your ship.

So replacement parts are often the first things that come to mind with regards to 3D printing in defense, but whole UAVs have been printed by several universities and at least one defense contractor. The whole UAV was printed out, all of its parts except for the electronics and the motors. Virginia Tech printed one out. It started on a Friday, finished on a Sunday. And it can fold up and be stowed in a backpack. The University of Southampton created one as well with a geodesic design. And for those of you who know what the old Vickers bombers from World War II were like, it has a geodesic design which is incredibly robust, but very expensive to make. With 3D printing complexity is free and you don’t have to worry about that.

And then finally, the University of Virginia printed one out. It flew 45 miles an hour. It was controlled by an Android phone that they just embedded in it, which allowed use of its camera for imagery. When they first flew it, they crashed it, destroyed the nosecone. They just went back, printed out a nosecone, slapped it back on, and had a successful flight. And I wish I could have had that capability when I was a maintenance officer. (Laughter)

So the eventual goal is not just to print out the parts to create these UAVs, but to actually print out a UAV that flies right out of the printer using embedded electronics. And an organic ability to print out cheap, replaceable drones from ships, forward-operating bases, or during disaster relief operations could be a huge enabler for our sailors and marines.

Speaking of disaster relief, the technology has applications there as well. And if you need to create a shelter or any kind of a structure on a forward-operating base or even a beachhead, the University of Southern California created a system called Contour Crafting, where basically 3D printing is upscaled and they can build a 2,500 square foot home in 20 hours without the windows and the doors. That takes a little bit longer. And the walls are printed from a special blend of cement and the end design has over three times the structural strength of conventional construction. In fact, those were the same folks who were funded by NASA to see if they could do the same thing using lunar soil. So basically all you had to ship to the moon were the 3D printers and then they could create the structure using that lunar soil, which they did using a synthetic substitute.

There was also a group in the Sahara Desert who did something similar. They set up a 3D printer that was solar powered and just used the sand around them to create glass parts. So that begs the question what if we could harvest some of the minerals in the surrounding ocean to help create some of these parts?

One of the other possible applications is ammunition. My Army counterpart at the Atlantic Council used to be the commanding officer of Radford Ammunitions Plant, where, among other things, they make the majority of the nitrocellulose and propellants for the U.S. arsenal. And so we started going back and forth talking about the possibility of being able to print out your bullets. And he said, well, the casing would be relatively easy, but, you know, the energetics and the propellants, without that you can’t do it.

So we went back to the guys at Virginia Tech and we organized a tour of Radford and they went out there and we toured the facility and, you know, went back and forth with the folks. And not only do they think it's possible and worth looking into, but 3D printing could actually make the burn rates more efficient in these energetics and actually give you better ammunition. And so although you need weapons in such large numbers, it would not necessarily be pragmatic. It might allow you to fill in stopgaps while you wait for resupplies or maybe even create custom ammunition for specific targets.

Another area which is already having one of the biggest impacts is health care. 3D printing has the potential to radically change how we take care of our sailors and marines. And, in fact, it's already being used extensively at Walter Reed. They have a really robust 3D lab called the 3D Medical Applications Center, where they're using 3D printing extensively.

They 3D scan soldiers in order to model custom prosthetics, which they then print out on-site. And it's also allowed them to scan skulls of soldiers with cranial damage so they can then turn and print out titanium plates that fit perfectly on the first try. So it's one field where 3D printing's ability to make multiple items, each customize for a different patient, really, truly shines.

So then you can move on to replacing skin tissue and organs. The field of regenerative medicine has used 3D printing extensively except they use living cells instead of ink. There's a company out of San Diego, which is the first commercial producer of bioprinting machines and they can build the thickest membrane so far. It actually already has the capillaries built in. They can create lung tissue, heart tissue, cartilage, and even bone. And one of the most notable features of the technology is that they use the patient's own cells, so it gets rid of the issue brought up with transplant rejection.

The main customer right now is pharmaceuticals such as Pfizer, who are using it to conduct human testing without actually humans, but you can see defense applications for skin or bone grafting as well as testing the effects of bioterrorism, agents, and irritants on our skin. And although their goal is to print out entire organs, during one of our conversations they explained to me that they don't necessarily need to recreate the organ itself, but just something like it that can restore a certain percentage of the disabled organ's functionality. So that made me wonder why not create a specialized organ which works better than the original? And I won't tell you what they said because they asked me not to. This opens up opportunities not just for on-site medical care, where removal of the patient is not feasible or safe, but possible bio-enhancement, obviously.

So finally, there's research currently being conducted into bioprinting drugs and vaccines. We've all heard about Craig Venter, what he's doing. Whether it's feasible or not, it does bring up some amazing implications for defense. Imagine the CDC e-mailing us the blueprints for a vaccine to avert an impending pandemic or defending against a possible biological attack. So we can print parts, drones, shelters, maybe some ammo.

How do we feed our sailors and marines? There's a company which is an offshoot of the previous company I spoke about based at NASA Ames, also partially funded by the USDA and the NSF that's working on that. And I have to say this quote: In 1932, Churchill said, "We shall escape the absurdity of growing a whole chicken in order to eat the breast or wing by growing these parts separately under a suitable medium." He said that 80 years ago and that's exactly when these guys are doing.

So they brew mead by extracting the muscle cells from the biopsy of an animal such as a cow or a pig. They allowed those cells to multiply to a significant amount, then they insert it into a cartridge, which is what they use for ink. They lay it out. It prints it out and then that grows in to muscle, which they then chop up and process -- well, it's not really processed, it's actually meat they chop up and put it -- you know, make it into sausage. The co-founders' dad, who's their scientific co-founder, actually on a TEDMED talk printed out and cooked a little pork chop that they made and ate it, so. (Laughter) So 3D printing in this case, bioprinting, just shortened our logistical tell again with an organic ability to produce food on site, reducing security risks, costs, and energy consumption.

So in conclusion, taken into account the current state of this technology and its advantages, you can see where it could drastically enhance our naval capabilities in the future. I think the Navy's strongly poised to benefit from this, more so than other service, for the same reason NASA expressed so much interest in it. I mean, what if *Apollo 13*'s astronauts could have just printed out the part they needed?

So we both work in remote environments, have a very optimized yet fixed inventory space, and we're tied to long, vulnerable, and, at times, costly supply chain. So it, therefore, stands to reason that a capability and grants us an organic ability to produce those items which keep us operational and in the fight as long as possible would have a humungous impact on our strategic impact to the service. Thanks.

MR. SHACHTMAN: Well, thanks, Mike. After a recent trip to KFC that I made, it's suddenly making a lot of sense because I'm pretty sure that wasn't any animal. (Laughter) Joe?

CDR KRAMEK: Yeah, it is hard to follow a guy who just told you how the next Chicken McNugget was going to be made and it's pretty scary.

But to bring something else to your attention in the Homeland Security realm since I'm from the Coast Guard, you've seen a lot of news articles lately about cybersecurity this, cybersecurity that, our cyber war. And I think it might be that the next real threat to our homeland security might not be a kinetic terrorism act, but, in fact, might be an act of cyber -- a cyber attack instead. And it's not just me saying this. You saw the

President mention this in the State of the Union. We heard Secretary Napolitano speak here not too long ago. I think Director Clapper was testifying yesterday as well as General Alexander on these same areas.

A little bit about U.S. critical infrastructure from a DHS perspective. DHS, Department of Homeland Security, has essentially sliced up the critical infrastructure pie, if you will, into about 18 sectors. All right? You hear a lot about the energy sector, you hear a lot about the finance sector. What you hear a little bit less about, which is the focus of my research, is the transportation sector. Transportation is one of those 18 pie slices. And within transportation you have aviation that the TSA, Transportation Security Administration, has responsibility for and the Coast Guard has responsibility for the maritime side.

Now, why maritime cybersecurity? I got asked that a lot as I proceeded with my research. And the reason is it's been said that the U.S. has a long weekend economy. That means that the gas that is in filling stations, the goods that are on your shelves in Walmart, Target, and grocery stores and the like, in our just-in-time inventory these days they're there for basically the space and time of a long weekend. And if you needed any evidence of that, the recent Hurricane Sandy showed you how quickly gasoline supplies were diminished, and the public panic that sets in, even in just a small sector of this nation.

And what you might not know, I know my Coast Guard friends in the audience do, but about 95 percent of those goods are shipped in by sea through our ports. And so what I wanted to look at was what the current state of cyber awareness and culture was in our ports. And what prompted me to do that was in November of 2011, a European security administration took a look at cybersecurity in their maritime sector and they found that it was "nonexistent." And that worried me a little bit because the shipping business, those of you who know it, is a pretty international business. And so I figured, well, if it's nonexistence there, you know, all the stuff that's coming from Europe, and a lot of those goods are coming here, and so what would it look like in U.S. ports?

And so what I did was I worked with some folks to try to develop a list of questions. I initially thought I was going to go in and do a vulnerability assessment, but I was quite naïve because people don't like talking about cybersecurity because it's like talking about, I guess, like your medical record or something. It's a little bit like your vulnerability, so you're not going to, like, walk in there and let them -- they're not going to reveal their network to you. So I had to take a little bit softer approach and so we developed some questions that were focused around sort of rooting out, you know, what is your current state of awareness. And these are in port facilities. What's your current state of, you know, prevention that you're taking? And what's your current state of response? And so that's what the questions were designed to do.

And from there, I went out into the big, wide world and decided to visit some ports. And you might not know this, but our ports are tiered, they're ranked by the Department of Homeland Security based on their threat level. There are seven Group 1 or Tier 1 ports. They're actually called port areas because a couple of these ports can be in the same area. So like New York and New Jersey is a Tier 1 port. Los Angeles and Long Beach is a Tier 1 port. Baltimore just to the north of us is a Group 2 port area. And they're ranked that way based, like I said, on a threat algorithm. And so what I wanted to do is I wanted to look at a West Coast port and an East Coast port, a Gulf Coast port, an inland port, and the military outload port. And in the range of those different tiers just as a selective sample to see, you know, what, if anything, was going on there in terms of, you know, cybersecurity initiatives.

And this is sort of just a soda straw view, it should be emphasized, because the U.S. has -- although there are 7 Tier 1 ports, we have about 360 ports. And behind those 360 ports are about 3,200 port facilities. So those are different people operating or leasing terminals within those ports. And much of this infrastructure is in the hands of private industry. So when I went out my interfaces were usually with port administrations, which are usually owned by municipalities. For instance, the Maryland Port Administration is a division of the Maryland Department of Transportation, and they manage the Port of Baltimore. Out in Los Angeles, the city of Los Angeles is a landlord port, so they own the port, but they lease out the hundreds of terminals there.

And so a little bit of what I found, generally speaking, is that -- well, actually it’s important to note I also looked at a military outload port and I chose Beaumont. It’s a little known fact, but down in Beaumont, Texas, that’s the largest U.S. military port; the second largest military port in the world, but the largest U.S. military port. Fifty percent of the goods that are supplying the overseas contingency operations go in and out of Beaumont, so I wanted to see what was going on down in Beaumont as well.

And the results were interesting. First and foremost, awareness. The level of cybersecurity awareness in these ports was generally high. I think that’s because of all the current media attention and the constant drumbeat. But what was equally interesting is that when I looked at the level of cybersecurity culture, it wasn’t high. It didn’t correspond at all and you’d think it would. And my current hypothesis for that is that the ports are being regulated right now by the Coast Guard and other agencies, and the focus on these regulations and laws is on physical security or what I call guns, gates, and guards. So what the ports are being held accountable for is, you know, do you have appropriate access to controls? Do you have security cameras? They’re not being held accountable for cybersecurity issues, so that’s not the wolf closest to their door, so they're not as concerned with it.

Prevention and preparedness. And here some of the things that we were looking for was has anyone had a cybersecurity vulnerability assessment conducted? Well, I found that of the ports I looked at, only one port had, in fact, done a cybersecurity vulnerability assessment. With a footnote: Down in Beaumont, although the Port of Beaumont hadn't done this, there's an Army transportation battalion, the 842nd, and the USTRANSCOM had come down there and done a vulnerability assessment on them.

What's kind of striking about that finding, so far at least, and I still have some new information and data coming in, is that that cybersecurity vulnerability assessment which was at the Port of Long Beach, they reported to me it cost only $30,000. Well, what you might not know is there's a really big grant program that was provided to assist ports in getting up to the security standards that were put in place post September 11th. That program has put up $2.6 billion in funding since inception. The funding for that grant program, this is the Port Security Grant Program, that's its official name. It's not managed by FEMA, but they consult with the Coast Guard. It was funded in FY '12 for just shy of $100 million, $97,500,000, but almost 60 percent of that money goes to those 7 Tier 1 ports. They split it up based on their individual ranking. So if you think like the Port of Long Beach is getting about, you know, say 6- to $7 million a year in grant funding and a vulnerability assessment only costs them $30,000 and they're one of the largest ports, that's kind of an interesting finding, at least to start out with. You wonder, you know, what more could be done?

And then response and recovery. And here one of the things I was looking for was do you have a cybersecurity response plan, a dedicated cybersecurity response plan, or, alternatively, do you have a response plan in part of your risk management? In other words, is there a cyber incident response plan in any other type of risk management plan you have? Not a single port had a standalone plan nor did any have a cyber incident plan integrated into their current risk management. Again with the footnote the 842nd down in Beaumont, the Transportation Command did because they're pretty attuned to this because they're very focused on military outload, even though the port that they work in did not.

So I have some recommendations. I'll just, you know, share a couple of them and then, hopefully, we can dedicate most of our time to the Q&A. But first of all, the Port Security Grant Program is certainly ripe for putting the spark underneath getting some cybersecurity initiatives in our maritime critical infrastructure. There's a lot of money in that program, but the solicitations that are put out have never expressly solicited for cybersecurity projects. These ports are buying things like underwater sonar, radars, new fire boats. They're not focused, again, on cybersecurity initiatives because they're not being held accountable for them. And moreover, the funding solicitation that FEMA puts out, you know, what should you make your projects look like in order to make your port more secure, have yet to expressly mention cybersecurity, although cybersecurity could certainly fit within this.

And number two, I think that a vulnerability assessment, perhaps mandating a vulnerability assessment for at least some of our most critical ports, would be an easy thing to do. And again, that grant money is a ready, available tool to start the initiative with that.

So I'll pull up from there and look forward to your questions. Thank you.

MR. SHACHTMAN: Thanks, Joe. God, I've learned a ton from these three presentations. I thought they were great.

We're going to open the floor up to questions. Please make them actual questions with a question mark at the end, not grand statements, manifestos, anything like that. And while people are getting their questions ready, I'll take moderator's prerogative and ask a first one to Mike because, you know, he's talking about printing your own meat and your own lunar bases.

You talked about sort of 3D printing additive manufacturing from a U.S. military point of view, from sort of the good guy point of view. But you didn't talk much about the dangers and the threats inherent in additive manufacturing. And I was hoping you could just spend a minute or two and talk about some potential risks associated with it.

CDR LLENZA: It's hard to get people excited about it when you tell them all the bad things that can come from it. (Laughter) There are many.

I think first and foremost is intellectual property rights. With 3D printing, once you get a design out there, as long as they have the printer they can make it. So whatever time you spent making that design and making that design yours and anybody can grab it off the ether, so that's the biggest one. So with many of our competitors, that's certainly a concern. That's the bottom line, though, is you can print anything. As long as you have the right printer you can do it.

Another big one is the ability to embed materials within materials. So one that the director of research at Office of Naval Research likes to bring up is the ability to make a fire hydrant that looks like a fire hydrant, works like a fire hydrant, and even smells like a fire hydrant to a dog, but is embedded with explosives and can work as an IED, so there's that.

MR. SHACHTMAN: Over here in the middle. Just wait for the microphone for a second.

MR. REUTER: Stewart Reuter, Navy League. I was going to ask a question of David since I figured out that 37 years ago I was the XO to Thomas Edison. Just a little bit.

Cybersecurity for the SSN, both in-port and underway?

LCDR FORMAN: Excellent question. So we're doing a couple of things. One is just getting the technology and keeping the commercial technology in our pockets off the submarine, so that's an element of it. There's a video that we showed to our crew, how your phone can look like it's off and you can have a classified conversation in the sonar shack and it'll transmit it off when you leave. So we're kind of piloting programs right now because it's difficult. You start to rely on that technology. The whole crew, you're going to get business done and a maintenance availability, but we need to keep those off the submarines.

And then we also have new hardware and new programs to manage the critical data on board. So you have a very rigid password program with certain people and it's a good technology to verify that we are not hacked. And there are protocols where you upgrade and downgrade you fire control and sonar system to verify that you never transmit top secret material over a secret data network. So we have made big advances in that realm. And I think it's easy because as we battle those problems right now in the commercial industry, you can't regulate necessarily because it goes at the heart of what they're trying to do. In the military it's quite easy. You come out this is what we need to do and this is what you're going to do, and we've adapted to that. So it's a quite secure program compared to the Internet, if you will.

MR. REUTER: What about attacks on your cyber --

LCDR FORMAN: Well, I think the same thing there. We are monitored and there was a submarine that was pinging off-haul through the SIPRNet. It was caught rather quickly and then shut down. So it turned out, as best as I know, it wasn't an actual attack. It was just a spurious code, but nothing was compromised.

MR. SHACHTMAN: Okay, over here in the middle.

SPEAKER: Commander Forman, of all the perceptions of deterrence and the forces associated with it and those of us who haven't worked in that area may have, what do you think is the most common misperception that people have about nuclear deterrence or is there one in particular that stands out that a lot of people believe it, but it's just blatantly wrong?

LCDR FORMAN: The approach that I took in trying to talk about deterrence was my first tour was an SSN, so that was my introduction to submarine force. My second tour was on an SSBN, so it was all very new to me. So there's a story with our first drill that I felt a little bit like Denzel Washington because I'd seen the movies before I had served on that type of submarine.

So we spent a lot of money and a lot of time and taken a whole crew to sea. And we have two crews on SSBNs we turn over and you motivate the crew. It's just personnel management. And the question in the room is what are we doing? So there are people out there that think that the weapons aren't usable. So I think while they're -- hopefully, the usability is very, very low. Some people are given the impression that they really are not at all usable. And if that's the case, then what are doing out there?

So I'm just trying to move the needle back and a little bit and leveraging it so that we don't have to use them, but that they're used wisely just as a deterrent. It's a very unique thing that they were used and maybe they've been deterred since then, so now there's these arguments of is past prologue and are we going to be successful for the next 60-some-odd years? So I think it just needs to be addressed. So I think that's it, it's whether or not it's a usable weapon today. And so the irony is that it is, we just really don't want to. But when you stop saying that it is, then somebody's going to end up using it, and that's the mix that we're in right now.

MR. SHACHTMAN: Okay, over here on the side.

COL ANGEVINE: Thank you. John Angevine, colonel, U.S. Army, retired. A real quick question on deterrence for Commander Forman.

Did you take time to think about what deterrence meant to each of the countries that we're currently in a nuclear weapons program? That does it mean something different to them as opposed to what we've experienced in the Cold War, one size fit all? Essentially it was a bipolar world. Did you take time to look at what that really meant to a U.S. policymaker in terms of approaching each of the actors that currently either have or nearly have a nuclear weapons capability?

LCDR FORMAN: Well, I think you're spot on. I'm not done with my research yet, but I think that's a key point. I mentioned briefly in my remarks how when you have very few, they play a very different role in your national security strategy of that country. So that's why I think talking about mutually assured destruction with North Korea to me is nonsensical because that's not the approach that they're taking. I don't think they're in a position to do that. And the logic that goes in for the political leaders and the military leaders if very different than what we are used to as a nation in the Cold War.

So, you know, I think RAND's legacy in helping our country develop the Cold War logic was key. And what I think needs to happen now is that next step in the second nuclear age, if you want to cal lit that. So, yes, I think they're all -- they play very different roles for each country that has them based on the role they play in the world, superpower or not, and how many weapons they have and then via what launch mechanisms they have.

SPEAKER: Okay. In the sort of middle back there and then it can go front and back.

MR. FRANKENSTEIN: Hi. My name is Will Frankenstein. I'm a Ph.D. student. The one question I have is these are three very different technologies and three very different risks. What would you change about the current level of technical discussion in D.C. regarding each of these technologies? And I believe, David, you mentioned that there has to be a discussion about nuclear policy that has to take place in think tanks around D.C. Is there enough external debate going on? Is there enough internal debate going on about each of these issues, including cybersecurity, the rise of 3D printing, and advanced manufacturing technologies?

MR. SHACHTMAN: Joe, why don't you --

CDR KRAMEK: What I find pretty interesting, and I've had the benefit of listening to Mike O'Hanlon and Steve Pifer as well, is one difference between cybersecurity is the attacks are going on right now. That's the total opposite of a deterrent strategy. I mean, just completely opposite. So, I mean, they're just in such juxtaposition that it's striking and it's worth thinking about.

Cybersecurity is hot right now. It's the current topic du jour, but certainly it's good to see that there's still a lot of discussion and I think actions and research like David's doing continue in that realm as well.

CDR LLENZA: As far as the conversation on additive manufacturing, I think as far as the Department of Defense my biggest thing there is the development of a strategy for adoption because there isn't one. It's almost seen as an evolution of the way we make things and it's not seen as a revolution, which it really is. I mean, this will displace how we manufacture things. And if the Department of Defense doesn't get in front of this and start shaping the direction of the technology and taking it to where they'd like it to go, we're going to end up being late adopters and I don't think that's where we want to be.

If you look at what -- Boeing has 22,000 printed parts in its airplanes. The F-35 has printed parts in its airplanes. The U-CAB has printed parts in its airplanes. If corporate America's already bought in on it, you know, their biggest concern is the bottom line. And if we're really, you know, concerned about our bottom line, then we need to get on this train and develop a strategy towards adopting additive manufacturing agency-wide.

MR. SHACHTMAN: I think we've got time for one last question. We're running a little bit behind, so let's wrap it up here.

SPEAKER: I'm wondering about a regime in which we publicly announce that the use of an Iranian nuclear weapon anywhere in the world or by one of its proxies would result in the disappearance of the Holy City of Qom upon 48 hours of evacuation notice. That was actually announced with the intent to enforce, whether that would be strong enough to terminate the Iranian atomic weapon development program.

MR. SHACHTMAN: I'm going to with one other question. Can we get one other question here? Thanks.

LTCOL DOMA: Hi. Lieutenant Colonel Doma in Headquarters, Marine Corps. Joe, this is more for you.

We talk about the port security. Most of the ports you referenced were privately owned, I think, or at least some of them were. So there's been a lot of discussion on cyber attacks in the media, but the enforcement and regulating cyber defense is difficult for the government to implement when you talk about private industry and privately owned institutions. So could you address how cybersecurity and transportation, how you could do any sort of enforcement and regulation, especially with regards to the public sector -- I'm sorry, the private sector?

CDR KRAMEK: Yes, sir. Thanks for the question. It's a great question.

Well, the title of my paper that Peter helped me out with a little bit was "The Critical Infrastructure Gap," because you put your finger right on it. There's a huge gap. Right now we are -- the Coast Guard is enforcing the Maritime Transportation Security Act regulations in ports. Those are physical security. There are no cybersecurity standards in ports. And since there's no standards nor is there anything to enforce. So I think you see this -- so there's a real thirst for legislation perhaps, if that's what you want, to set up standards using NIST standards and go in and have perhaps the Coast Guard enforce it. That's certainly one paradigm that you could do. It would take some training as well to get that ruling because this is not a core competency that Coast Guard people have, or maybe you contract it out.

But you highlight what's occurring on a broader scale. I mean, Congress hasn't been able to get cyber legislation passed at all. And so the President recently on the eve of the State of the Union put out this new Executive Order and PPD, and it's sort of this voluntary scheme where he's encouraging folks, hey, you need to go cooperate. Government agencies, go out with private industries, seek their cooperation, and that way, you know, you can sort of build up some type of cybersecurity in the sector, the slice. Remember I talked about the 18 slices that you're responsible for.

Well, it sure is tough to, you know, be a government agency in that position because the private industry doesn't have any incentive to talk to you. It's happened in the finance sector, but it's happened because of the persistence of the attacks, you know, was so aggressive that they finally said maybe we do need a really good government partner like the NSA, but it hasn't happened in other areas of critical infrastructure. And, in fact, a lot of the maritime sectors, I went to Vicksburg as my inland port and Ergon Energy had a facility there, so they're also in the energy sector. And they don't want to cooperate, they said to me flat out. And the reason is because they were concerned some of their proprietary technology for how they refine fuels into certain substances might be compromised through -- they said it would be leaked by government FOIA requests as secondary -- and also because they feared activists such as environmentalists.

And so I think that gap is going to be tremendously hard to bridge. So I guess, you know, wait and see how that's done.

MR. SHACHTMAN: Okay. Let's give a hand to our panelists.

(Applause)

Take a short break for the final panel to come up.

(Recess)

MR. SINGER: Well, in many ways, this panel, looking at Maritime issues, captures much of what we've talked about today but also the strategic challenge for the U.S. as a whole. We're traveling through the same waters, but we have many evolving and/or new missions.

And this panel also captures a little bit of what I talked about at the beginning of the conference of how you have folks that back in the fall had to select research topics that now are popping in the news, whether it's I wonder what was paid off to North Korea to make them enter into the news right now, to we've got continuing unrest in Bahrain; we've got territorial disputes in the maritime domain. So, essentially we've got a series of topics that are both right out of the headlines but also enduring strategic questions.

And so it's a great panel that's been assembled. First we're going to hear from Lt. Colonel John Edwards, U.S. Air Force, who is National Defense Visiting Fellow at the Stimson Center. His topic is "Are Nuclear Weapons Dominant to Assuring

South Korea and Japan for Effective Extended Deterrence." And he brings to this a great deal of expertise as an Air Force lieutenant colonel who prior to this assignment commanded the 96th Bomb Squadron, the Red Devils, that was responsible for leading eleven B-52 bombers in providing both nuclear and conventional combat power. So, he speaks with authority on this research as it applies to U.S. nuclear policy in Asia-Pacific.

Then we'll hear from Commander Rich McDaniel, U.S. Navy, who's with us here at Brookings as a Federal Executive Fellow. His topic is "No Plan B: Strategic Basing Loss and the Question of Bahrain." He's a Navy Surface Warfare officer with five tours at sea under his belt, who most recently commanded the USS STERETT, an AEGIS Class Destroyer that was deployed to the CINCOM area, including the topic of his paper, Bahrain.

And finally we'll hear from Captain Brian Penoyer, who's at the Center for Strategic and International Studies right now. His topic is looking at "Maritime Governance: Aligning Civil Maritime presence and Capability to Human Activity." He's a U.S. Coast Guard officer, a specialist in coastal operations and designated as a marine safety professional. He served in a number of operational tours over his 22-year career, and so he speaks with a great deal of experience and authority on maritime governance issues. So, we're all looking forward to hearing from him.

So, I think we're going to start with John.

LT. COLONEL EDWARDS: Thank you, Peter, and I appreciate being here at Brookings. And everybody who stayed behind for the very last event, it's certainly not lost on us that we're the last speakers. So, this one might be a little faster and will try to be somewhat funnier.

Also, thanks to Pete -- at the beginning of the year he came out and talked to the Air Force Fellows Program and really gave us a great deal of insight into what our year would be like here. And my plan for this year was not only to take a need but to look at some national security issue out there that was quiet, that was not in the news, that I could spend a lot of quiet time on and just think a lot about it; and then right at the heart of the research North Korea kicks off another ballistic missile test. Then just last month we hear that the third nuclear test has occurred. So, it has very much projected the topic in the news, and it's been somewhat difficult to keep those recent events out of the historical look that I did on this particular topic.

So, as my last assignment as a B-52 squadron commander, I was very much a practitioner of extended deterrence in the Asia-Pacific. My last rotation out there was in 2011, and we did a lot of flying and a lot of assuring of our allies in support of the U.S. Pacific Command's campaign plan out there. And coming back here this year, I wanted to take a broader look at extended deterrence, looking more at the diplomatic aspects of it as well as the holistic effort that the U.S. does to make this happen and assure our friends out there. Extended deterrence and assurance are two sides of the same coin essentially. We do things to deter an adversary out there while at the same time assuring an ally. So, often times the measures that we take have to be balanced between those two groups.

Effective assurance essentially means that we're assuring our allies enough that they don't develop their own nuclear weapons while also averting a greater security crisis. By analyzing nuclear weapons in the diplomatic dialog and military efforts, the research enabled me to weigh nuclear capabilities against non-nuclear capabilities in assuring allies. Specifically, I looked at declaratory statements, military force deployments, and exercises throughout history; and I picked three cases that somewhat transcended time in the last 40 years, looking at a case here in the Cold War period, a case in the transitional post-Cold War period, as well as a recent case after -- actually, the last case was a 2006 case.

I examined U.S. assurance of South Korea during two particular crises: the 1976 ax murder incident on the DMZ as well as the 2006 North Korean nuclear test. A year after South Korea's 1975 ratification of the NBT, North Korean troops murdered two U.S. Army officers along the DMZ, creating an assurance crisis that could have escalated to open conflict and/or may have tempted South Korea to restart its nuclear program. The U.S.'s main effort relied heavily on the military, demonstrating its nuclear capabilities. The U.S. at the time deployed nuclear-capable F-111s to the Korean Peninsula, as well as F-4 aircraft, a carrier battle group which, at the time, also possessed tactical nuclear weapons exercised with the South Korean forces, and B-52s dropped actual conventional ordnance along the DMZ as a show of force. So, this was very clearly a clear case where we used a lot of nuclear capabilities in our response to display our commitment to securing South Korea during this incident.

On the diplomatic front, it was a little more muted in that there were not a lot of public declaratory statements. A lot of the discussions occurred essentially between the U.N. commander and the president of South Korea at that time, President Kim.

So, we saw that nuclear weapons played a very central part of this debate. It played a central part in this effort. But it played a greater part in the military show of force that was captured by Operation Paul Bunyan, which was the overall operation at the time.

As many of you remember, the 2006 nuclear test was North Korea's first nuclear explosion, and it required a significant amount of assurance on our efforts. Diplomatically, the President reaffirmed that the U.S. meet the full range of it deterrence commitments to both South Korea and Japan, while the Secretary of State explicitly mentioned the nuclear umbrella during her visit to the region shortly after. Diplomacy was buttressed by the fact that we had already had significant nuclear capabilities in the Asia-Pacific. Since 2004, nuclear-capable B-2 and B-52 aircraft have been on a continuous bomber rotation into the Asia-Pacific, and that goes on today.

So, again, nuclear capabilities in this case played a central role in our diplomatic efforts, because it was used in declaratory statements as well as being backed up by our military efforts because we had those capabilities out there.

In examining Japanese assurance, I used the 2006 North Korean nuclear test again with the previously mentioned results, as well as the 1998 North Korean nuclear test. Interestingly, in 1998 the posture of South Korea and Japan was more openly engaged in North Korea to try to improve relations, and that's going to be an important point when I get to my implications of what this means.

This fact, combined with challenges the U.S. was facing from Milosevic -- this was the fall of '98 -- as well as Iraq, as many of you remember, shortly after this test, a couple months after this test, we did have to deploy B-52s to England for the first time since World War II as a show of force, and then at the same we sent B-52s down to the island of Diego Garcia to support Middle East operations. And in December of that year we executed Operation Dessert Fox, which was airstrikes against Iraq. So, there are a lot of external factors that made this case very difficult to try to determine if nuclear weapons played a role. So, this was somewhat of the anomaly. It was very elusive.

The 1976 ax murder and the 2006 nuclear test cases point, with reasonable certainty, that nuclear weapons were dominant in assurance, but as part of a broader U.S. effort the '98 nuclear test was more elusive, as I mentioned before, because the U.S. efforts were minimal, but predominantly they were overshadowed by other factors going on.

So, what are the results and conclusion? Well, at this time nuclear weapons are indispensable as a broader U.S. effort in assuring South Korea and Japan. I think that it's clear from at least two of those cases.

The study also provides several implications for U.S. extended deterrence policy. Nuclear weapons wielded diplomatically are just as effective as agile military demonstrations of force. There must be alignment between the assurance effort and the ally's overall security posture, as both the ally and the protector nation -- in this case, the United States -- must share the same perception of the threat. In the 1998 case South Korea and Japan were very much trying to engage with North Korea, so there was a smaller requirement for the U.S. to provide assurance just because of the political actions that were going on.

For allies facing a nuclear threat, nuclear weapons remain an irreplaceable capability to assurance. And as some Japanese and South Korean defense experts view it as the ultimate weapon, it is a critical sign of the importance that the play in America's security.

It is not the not the number of nuclear weapons but the type of nuclear weapons that is most important to assurance. Even nuclear powered ships and submarines that aren't nuclear weapons in themselves can contribute to assurance. Nuclear bombers have served as the primary choice for assurance, followed by dual-capable fighter aircraft, and, to a lesser extent, ICBMs and SLBMs. Missile submarines played a larger role prior to the 1980s but have since been mostly absent in assurance efforts as openly reported. And we need to reassess both SLBMs' and ICBMs' contribution to extended deterrence.

Another point was that the integration of nuclear and non-nuclear capabilities can be pivotal to effective assurance, and this includes ballistic missile defenses, cyber, space, special operations, and conventional global strike. Yet it remains very tough to persuade allies of this point. South Korean and Japanese defense experts just aren't buying the fact that non-nuclear capabilities can replace nuclear ones.

The role of B&B in assurance -- that's another factor. Does it bolster the extended deterrent? Or does it serve as a backup should extended deterrence fail? I believe it's both.

And, more broadly, assuring allies depends on the specific regional context; hence, European, Middle Eastern, and Asian-Pacific assurance measures must be individually crafted. A one-size-fits-all approach will not work.

So, let me close by saying -- because I promised to be fast -- as we continue to reduce the role of nuclear weapons in our national security per the 2010 nuclear posture review, it is important to recognize that extended deterrence requirements will likely assume a larger place in central deterrence in the overall deterrence strategy of the United States.

Especially in assuring South Korea and Japan, you face an unpredictable and an irascible North Korea. Likewise, Iran presents a challenge to our allies in the Middle East. The question is what do we do should Iran go nuclear?

In Europe NATO remains a nuclear alliance per the 2010 summit in Chicago. But there is debate in some capitals in Europe right now as to the agile role of nuclear weapons in its future.

With that, I'd just like to thank Brookings again and Peter again for having us and hosting us, and I look forward to questions and comments that end in a question mark.

COMMANDER McDANIEL: All right, well I, too, want to thank Brookings here. Thanks for hosting this. And thank you guys for bearing with us today so late in the afternoon.

Again, I'm a commander in the Navy. The name of my research is "No Plan B: U.S. Strategic Basing in the Middle East and the Question of Bahrain." Our bases serve valuable purposes. They protect our interests; we maintain stability; and we preserve security and peace throughout the world. However, they can be lost due to various reasons: policy differences with a host country; a shift in political leadership, either abroad or at home; unpopularity or winning support from the host nation population.

I looked at two cases where we have lost bases in the past. I looked at Clark Air Base in Subic Naval Station. I also looked at pre-revolutionary Iran. In Iran, we had bases that the CIA basically manned, and they would monitor Russian troop movements and missile launches. They could also listen across the border. We basically lost those. Both Philippines and Iran were a failure to understand what was going on in-country on the ground at the time.

Robert Jervis has a book, *Why Intelligence Fails: Lessons from the Iranian Revolution and the Iraq War*. And he has a great quote: "The fundamental reason for the failure" -- he's referencing Iran here. "The fundamental reason for the failure was the judgments were based mostly on their inherent plausibility, and alternative possibilities were not seriously considered." So, one lesson learned here is planners must understand the plausibility of losing Bahrain.

In the Philippines, there was a surge of nationalism. Basically, if you -- in 1991, the conventional wisdom was that we would keep the base. A surge of nationalism basically resulted in the Senate in the Philippines not renewing the lease. Money was readily available I think to the tune of 408 million to renew the lease. But it was not renewed.

So, ultimately, governments will act in a manner that's in their own interest, all right? So, that's another takeaway.

Let's fast forward to Bahrain. While Bahrain in the past two years -- I had just flown to Bahrain, actually, to take command of my ship right after the protest had occurred, and, frankly, I hadn't been tracking it that closely, just loosely in the news. But what we've seen is the Sunni majority. For those of you who don't know the situation, the ruling Alkali for families is the Sunni Muslim family, and the majority of the population -- roughly 65 percent of the population is Shia.

While the protests don't appear to be going away, they don't seem to be edging closer to resolution. There have been some promising signs, and I'm not going to get into all the details, but the bottom line is progress for democratic reforms has not been moving quickly.

It's an understatement to say that Bahrain is a strategic imperative. If you go to Bahrain, we had built our maritime strategy around the centerpiece of Bahrain. It's very key. So, the answer is -- when I ask planners, would you let Bahrain slip away? the emphatic answer is no. What I get is that the plan is to let Plan A work; there is no Plan B. Now, that was surprising to me, because as a military person what do you always do? You always plan. You have contingencies. So, it seemed a little bit odd that the only plan is to let Plan A work. Why is that?

Well, most are concerned. You ask planners, and most are very concerned with the severity and the duration of the unrest. But they don't believe when I ask -- I said, do you think the U.S. will let Bahrain slip away? They absolutely say no. And then they say Saudi Arabia won't let Bahrain slip away.

The point that I'm going to make is that despite our best intentions, this situation could get ahead of us, and then it could spiral out of control where we don't have control and we can no longer influence.

So, the Saudi influence. I don't think you can talk Bahrain without talking the Saudi influence. A senior U.S. Naval Officer compared the importance of Bahrain to Saudi Arabia. He said Bahrain is to Saudi Arabia as Hong Kong is to China. If you understand that dynamic, you understand that they're very close.

So, in no uncertain terms would the House of Saud let Bahrain fall. There's even a Shia-Sunni rift, if you will, going throughout the Middle East right now, and you'll see that in Bahrain. Sometimes you'll see that there's an Iranian under every rock. So, a lot of times what calls for general reform is played off as sometimes Iranian subversive activity.

So, when you look at Saudi Arabia, when you look at these trends, if you think Saudi won't let it fall, you have to ask yourself, too, is Saudi stable? And I would reply, well, that's questionable. There's not been a generational pass in leadership to the younger generation, and there's a lot of high unemployment and discontent among the youth. Same thing holds true in Bahrain.

There's a Middle East expert that basically summarized very succinctly what could happen in Bahrain, and that is reform, repression, or revolution. So, reform -- obviously open dialog occurs with the ruling family in opposition, and genuine reform ensues. That has happened in the past. We have had dialog between the two, and genuine reform has begun to take place. The ruling family in scenario 2 can engage in another violent crackdown if the U.S. turns a blind eye, or we could be viewed as being complicit. And 3, a violent revolution could occur again, and a new government could take over. It's plausible. It could happen, particularly with instability in Saudi. So, if option 2 or 3 happens, it's doubtful that U.S. basing would survive.

So, when I ask planners about this: Do reforms in Bahrain jeopardize

U.S. interest in the region? Well, their comeback is usually that they're uncertain of what a democratic reform with the Shia involved would look like. So, that uncertainty provides a lot of skepticism, and they point to past subversive activity for their justification.

So, bottom line -- what I want to paint is that this is a very tenuous situation. It's something where I think we need alternatives. So, you can pull yourself back and say should we have alternatives? And I think the answer is yes.

So, if we lost Bahrain -- I want to quickly go over what do we lose. Well, we lose a long-term ally. I've worked with the Bahrainis. They're a very, very kind people. They're a very good people. And they've been gracious, gracious hosts to the U.S. Navy. They were designated a major non-NATO ally in 2002. We also lose the ability to maintain our fleet. One of the primary things Bahrain brings to the table is the ability to replenish a fleet that is forward deployed. That's critical. Robust infrastructure. They have shipyards, burse. They have some of the only ports that can depth-wise accommodate the drafts of our combatant in the Middle East. Isa Air Base. It's one of the key air terminals that. It's located on Bahrain. It flows in logistics and personnel and also serves as a divert field for the carriers. A key command and control center. When you look, Bahrain is home to Fifth Fleet/NAVCENT, U.S. Marine Forces Central Command; DESRON 50; and three combined maritime forces.

Finally, one thing you don't hear a lot of but I think is worth mentioning is that if we were to let Bahrain slip away, you lose an integrated model community. It's one of the only communities in the Middle East where U.S. servicemen and women live out in town amongst the Muslim population. That is a model that I think is worth copying. It's noteworthy. It really is, and it's a good thing.

So, where would the U.S. relocate if Bahrain was lost tomorrow? Bottom line? There is no place. Jebel Ali could accommodate some of our ships, but there's nowhere we could go for the long term.

So, would a sea base work? Well, the answer is you could do it on a short term. You can have continuity of operations in a crisis situation. But for a long term, when you think about what I just mentioned, can you put that on sea base? When you have naval operations, you have limitations when you operate solely from a sea base with C2, number one. The maintenance infrastructure. You will not have that. You would lose that.

It also sends a negative message. The first thing it would send to the Bahraini government, who are our allies, is that we're withdrawing. So, you would need to message that carefully. The Bahraini people would view the move as floundering support. I think the opposition would view the move negatively as well, because they want us to stay in country. They might see it as a closing window for reform, because they really see us being there as a window and as a moderating force to achieve democratic reforms.

And, finally, sea basing assumes an uncontested maritime environment. In any conflict from a sea base, you have to have combatants present to defend the sea (inaudible) platform.

My alternatives: Shuaiba, Kuwait. Granted, this port would need a lot of modifications, and it can't happen overnight. I'm talking this would happen years down the road, but it's something that is doable.

The best recommendation I have is New Doha Port, Qatar. It's going to have a very deep draft. They claim it's going to be the deepest in the world. And if you even look at they're developing pictorials for their port, they have an aircraft carrier that they've written in the picture, so you can tell what they want.

But you could do air logistics out of Udeid Air Base or Doha International as well. So, it is viable. Both of those places are viable. I have more data if anyone is interested in hearing that afterward.

The way ahead: I think we should conduct a Bahraini war game; set up a crisis situation; have parties that can accurately reflect the views of the Saudis, of the opposition, of the Americans, of the Bahrainis; and test outcomes to see what happens if we don't think this is plausible.

Plan with a sense of urgency: When I've talked to planners and asked if Plan B is even desired, they say, well, not really. In other words, there's not a sense of urgency there. They don't believe that the situation could spiral out of control.

Conduct an analysis on alternative locations: I would recommend doing site visits to some of these alternatives and see what exactly is needed to make it work.

The conclusion: Alternative locations that are viable strengthen the U.S. negotiation position. The (inaudible), the strong do what they can, the weak suffer what they must. Well, we are not in a position of strength with negotiation right now. Viable alternatives put us back into a position of strength.

And also the other benefit is it gives us the moral high ground. What is the biggest critique to the United States right now with regard to the Bahrain situation? It is that we let abuses -- and we don't prevent but we don't encourage reform and lean on the Bahrain government as much as we could, because we're vested in the area. What I'm saying is stick with Bahrain, influence Bahrain because they are an ally, but have viable alternatives. This will give you the moral high ground. Also it will put in the back of the Bahrainis' mind: Hey, they do have this Plan B; it is viable. That will encourage them to perform as well.

And, finally, it's strategically advantageous. When you talk about a conflict, a future conflict with Iran, if you divide and make targeting harder, it's the smarter move.

So, with those reasons I'll end, but I look forward to your questions. Thanks.

CAPTAIN PENOYER: So, my thanks to the folks here at Brookings. Thank you very much for hosting. I'll relish my opportunity to be the last speaker between you and the door.

I'll begin by saying that I started my research this year in maritime governance. Sort of I backed into it. I had the opportunity to serve a couple of years ago in Coast Guard Congressional Affairs, and for those of you who don't know the ins and outs of the Hill -- this is probably the audience that would -- the Coast Guard and the Department of Homeland Security, unlike our brother in Armed Services, we have a divided oversight, which boils down to meaning that there are multiple committees of jurisdiction that have a piece of us all for authorization.

And then Appropriations is a more orderly, unitary oversight. But for authorization, we walk around and we talk to a bunch of different folks. And in that process I repeatedly had this experience, which resonated deeply with me and perhaps with other Coast Guard officers, which was that sort of in the category of you stand where you sit, you would talk to someone in one committee and they would talk about the Coast Guard as they knew it. And you talk to the next committee and it was almost like you were talking about a different agency.

In addition to that, I was sitting, talking to these folks, and they didn't just have jurisdiction over us, they had jurisdiction over other agencies that worked in the maritime: NOAA, Myriad, others, the Army Corps of Engineers, et cetera. So, I would have these continuous discussions where, you know, there would be this sort of very -- I don't want to say "slanted" but narrow view of what the Coast Guard was or what these other sea services were.

So, I came to rely on the following definition that I stole from Professor Geoffrey Till -- he sits in the Corbett Chair, and it's the last time I'm going to say "Corbett" to a U.S. audience -- but he said that the U.S. Coast Guard -- he's speaking of it specifically -- he said the U.S. Coast Guard is the middle domain of sea power between hard combatant power and commercial prowess and bounded by law enforcement and incident management.

Pretty nice little melicom. We're in that box. And I would say that every time someone would challenge me: Why are you paying attention to this?, you should only do what our committee want you to do, or our committee's emphasis is more important than these other things you're doing, I'd say: Well, they're working a profusion of all these things. We're the middle domain.

But even then nagging in the back of my head there were a lot of other agencies in that middle domain with me, and that got me interested in thinking -- I thought I would ask a simple question: Why is that bound at CSIS? I have a whole year to think my way through this simple question. I understand what power projection is. I understand what command of the sea is. What is the middle domain of sea power? And, if you know that, then what does the national interest require in that middle domain of sea power?

You would think that would be a simple question, and I thought certainly there would be certified smart people all over the globe that had the answers ready and waiting for me. And it turns out that there's a cacophony of answers, none of which in my mind are satisfactory.

The terms you most often hear are things like civil maritime governance or maritime security to distinguish it in some way from combatant operations, I suppose --

law enforcement versus combatant operations. None of them really are very helpful. In fact, I've been part of the problem myself. I've shown this lovely Coast Guard graphic that we have that shows the intensity of conflict, and there's this little sliding scale where if it gets nasty we call the Navy.

If it's law enforcement, hopefully they're calling us, you know? It's that sort of a nice little thing, and in fact it perpetuates these sorts of artificial divides, because if you think about that for more than a moment, you realize that the Navy is out there doing a lot of things, which are not high kinetic combat operations.

And, conversely, the United States Coast Guard has some fairly significant use-of-force capabilities. But we all know at our gut level there's some kind of distinction here and we're not getting our hands on it.

So, I went back to that question, and I spent a lot of time thinking about it, and I revert back to Geoff Till because he's a really certified smart guy, and he says, well, basically any coastal state has got five interests at sea. You want civil order along your coastlines, and that's both -- you don't want bad things happening in the water near your state, and also you don't want that stuff cascading ashore. And I'm thinking here of -- you can imagine something like piracy or you can talk about other things like the landing of drugs, illegal immigration, and so on.

You want to use sea transport. I mean, we're back to Mahon here. You know, you've got commerce interests. You've got sea resources out there -- oil, minerals, et cetera. You've got the sea environment itself, because it turns out, as we've all seen in the last year or so -- I guess more than that, three year ago -- that's kind of a big deal. And then, finally, you have territorial dominion, control of your territory. He calls it sea dominion.

As I thought through that, though, all except that last one revolved around human activity at sea, and this is really, I think, the crux of the problem, because when you think about sea power, the last serious, profound exploration that we had of this, there was very little going on at sea other than fishing. Even shipping was a shadow of what it is today. So, we worried about sea lines of communication, and that's about as deep as it went. The idea that the sea could become an occupied territory, as the Gulf of Mexico is, was simply not conceivable, and that trend is not decreasing. It is escalating, and one need look no further than places like the East China Sea to see how a small interior sea is becoming more and more a living, breathing piece of territory.

So, if you think about that, human activity then becomes the interests of -- well, to turn that on its head, you need that high end, that command of the sea to seize and control territory. But once you've got it, if you want to do anything with it, you're going to have to do something else. You're going to have to govern. And that's what Geoff Till was talking about with those other four interests. And so what I've come to the conclusion of is that we need to really need to think of sea power as being composed of both command of the sea and governance. Command and governance together are what a nation needs to advance its interests. You can't go there unless you have the ability to take and hold your own territory at sea. But once you've done that, you have to have the ability to encourage, underwrite, safeguard, regulate, and administrate human activity at sea.

All of that middle domain is about that governance activity, and that in turn leads to a number of consequences and some observations that you could perhaps draw about activities at sea, particularly as you see them in the news. A question you should ask yourself as you review any news article that comes out of our maritime territorial disputes is: Is this a territorial integrity question, or is this a human-activity-at-sea question? Because the solution that you choose for that is very different.

And I want to say this about coming back to the navies. Another confounding factor for why this seems so hard to come to is the fact that navies around the world, including the U.S. Navy, are profoundly engaged in governance activities. So, it emphasized for me that that seemed to be a point of confusion for a lot of the folks that I've talked to and that I've read. But to me, it emphasized the fact that they're actually integral, cooperative parts of sea power.

And so I'll really pretty much stop there except to lay this and say that if you consider emerging places like the Arctic, a lot of people have asked and opined in a lot of congressional testimony: When do we need to be there? -- et cetera. It's really the wrong question. I think really the right question is: What human activity do you want to have in the Arctic? Because if you tell me that, I can tell you how you have to govern it. The next question you should ask is: What human activity is unavoidable in the Arctic? Because then I can tell you what you need to govern back. And those are both very different questions than what do I need to stake my territorial integrity in the Arctic? -- which is, again, a very separate and different question.

So, with that, I'll stop. Thank you.

MR. SINGER: Great. Three really fantastic –presentations. Interesting stuff.

I'm going to abuse the chair and poke each one of you with, hopefully, a challenging question. So, let me work backward. First, Brian, where you ended raises -- and I'm curious as to whether the different types of new human activities in these places offer different types of territorial claims. Will we see a differentiation based on, you know: Do I have a base? Do I have people living there? Do I have mineral operations there? No, that's my fishery. No, that -- I mean, do you see where I'm going is that you said we've got a multiplicity of new kinds of human activities? Do they all count as one in the same, or do we see a different emerging way of interpreting them in the international space?

To Rich, are there lessons from your research that looked at past cases of Iran and the Philippines Subic Bay loss and then applying it to Bahrain today? Are there more generalizable lessons beyond just Bahrain, that is, like, more broadly, maybe other situations, et cetera?

And then, finally, to John. It's sort of a research question, but it's also a policy question, because one of the things you said is you found that in each of these cases where we had success we deployed nuclear forces. How do nations in those areas -- or do they even -- disaggregate between ah, you know, I'm going to see my Navy guys if we've got a Navy aviator, and then aha, it is the presence of a -- well, you said it was the presence of nuclear forces. They would say no, it's the traditional -- the aircraft carrier showed up and whether it had bombs on it or not was not the case. And everybody has this kind of story for their own service narrative. And so was it the fact that it was the bombs, the nuclear weapons, or was it all this other capacity that was brought in? Because it raises, again, to actually the prior panel, a usability issue. And it would be similar to the B-52 case. You know, was it the fact that B-52s showed up and could rain down JDAMs, or was it B-52s that could rain down nuclear weapons that was most in the minds of these regional players?

Why don't we go through.

CAPTAIN PENOYER: Right. So, this question of these new types of human activity and how they're understood in terms of what that means, that's really -- probably the most illustrative case for that is the East China Sea, at least in my experience, because it raises two things. First, when one looks at something like the Senkaku/Diaoyu island dispute, there's actually not a lot of human activity there to be governed. However, there's a lot of potential human activity there, which leads to the question of sovereignty over those islands. And the reason for this is that all maritime activity under the law of the sea and customary international law is completely contingent upon old school sovereign territory ashore. There's no such thing as independent maritime territories. They all hinge on the land. And if you own the dirt, you own the associated maritime regime and the human activity. So, my short answer to your question is no, it isn't the human activity; rather, it points back to this coupled sovereignty and governance issue. So, you can't really get to governing unless you solve the sovereignty issue first.

So, I bring that up also to say that under the customary international law of territory acquisition, one of the ways that you acquire territory is to say this property was vacant. It's *terra nullius;* I'm taking it. So, if you don't want your island seized, one of the ways you prove that it wasn't vacant is you try to govern it. So, there's this odd circularity where we're going to try to deny each other's governance just so we can support our claims if it ever gets to the point where we try to make the case either in the public or in the International Court of Justice: No, that wasn't *terra nullius*; that's our land; we were governing it.

So, I would say that the wide variety of, for instance, sub-sea mineral exploration and deep water oil drilling hasn't changed the game. In fact, it's pointed right back at the old school sovereignty.

COMMANDER McDANIEL: I think broad lessons that I took away are that foreign aid doesn't always guarantee success; governments act in their own interest; and, most importantly, understanding the situation on the ground, because when you look at basing -- for instance, I just Googled Okinawa and the base in Okinawa, and there were a lot of sites on the unwanted U.S. presences on Okinawa. So, I'm not saying we're about to lose Okinawa, so please don't misquote me on that. But it was interesting, and understanding that will allow you to best form your policies and decisions for that particular area.

For instance, in Iran, when the Carter administration came in and they basically said they were really tough on human rights, and they basically said, hey, we'll cut that off, a lot of people pointed to that just saying, hey, you cutting the four military cells is what undercut the shah and led to the fall of the shah. That's the debatable, but a lot of critics have said that. And I'll say that that's exactly applicable to Bahrain. Maybe it is. That's debatable as well. But what I say is that if you understand the situation on the ground -- we didn't even see that situation in Iran coming -- if you understand better what's going on, on the ground, you can better align policy.

LT. COLONEL EDWARDS: Okay, well, that's a tough question on how disaggregate the nuclear/non-nuclear capability of a single system. So, let me approach it by going back more broadly to the fact that for extended deterrence you really need to look at nuclear systems that are regionally sized, because that's what matters. And the case in point there is when the Navy decided to retire the TLAMN, and that created somewhat of an assurance crisis with the Japanese, because the Navy viewed that as very much a weapon that met their regional context. So, there are some factors there.

When you're trying to break it out from a single system, it becomes very difficult, and at the end of the day it is somewhat of a judgment call on the researcher's part to go, you know, I think that I could reasonably say that this was it.

On the flip side to that, too, is when you have dual-capable nuclear/non-nuclear weapon systems like heavy strategic aircraft, dual-capable aircraft on a day-to-day basis, I go out there and I exercise the bombing capability of the B-52. Now, it's just a matter of switching ordnance from conventional to nuclear, so I'd probably get a lot more credible deterrent effect and therefore assurance effect by having that capability.

So, does that kind of shed some light on the question, Peter?

MR. SINGER: Right. Let's open it up -- right there, John.

SPEAKER: Thank you. My question is for Lt. Colonel Edwards. Have you given thought to what driving force would move Japan and South Korea from their respective nuclear development threshold to move forward in their development of a deployable nuclear weapon?

Oh, Peter, just by the way, since he's collecting his thoughts, I have more questions if I get a chance.

MR. SINGER: Fire one more. Okay.

SPEAKER: The second one is for Commander McDaniel. When you take a look at the Indonesia case study in terms of engagement versus sanctions with the type of human rights outcome that we would like to see in a particular country or at least in accordance with the U.N. Charter at the minimum, Australia seems to take more of an engagement role in and the U.S. withdraws from engagement in trying to coerce a type of outcome activity, and do you think that would undermine U.S. policy in Bahrain by engaging them vice coercing them into an activity? And then by mentioning a Plan B in public, do you think that the political intelligentsia in both countries would perceive that as a vote of no confidence in Bahrain's current efforts to reform?

LT. COLONEL EDWARDS: Okay, and if I understand the question right, it's would it essentially cause South Korea and Japan to move forward with their own nuclear program? Well, I think in the case of South Korea in the early '70s, you know, we saw that when we decided to remove I think it was the 7th Infantry Division off the peninsula, and they began a program and they were with the French. And then the fall of Saigon in '75 certainly also created another assurance crisis to that. And it took a lot of effort on the U.S.'s part to get them to reverse that step. We saw the same thing again in the early '80s with South Korea, too. It's the same thing the Carter administration was announcing that they wanted to remove more troops off the peninsula.

Around that time, we also had a lot -- we still had B-52s on Guam that were there on a permanent basis. Submarines as reported on FAS.org were visiting ports in South Korea. So, there are a lot of things that the U.S. was doing to assure them and to somewhat dissuade them from going down a proliferation track.

In the case of Japan, I think that in the -- especially since 2006 the dialog has begun. In fact, I think it was only last year where I believe it was the mayor Osaka who even jumped in on this and made a comment to the effect that the Japanese government should start looking now. I don't know what their red lines are. I can't speak for the governments of South Korea and Japan on what it would be, but I could say that they've made the -- in the case of South Korea, they've made the decision in the past. It could happen again if our extended deterrent and assurance is not effective and not strong. In the case of Japan, they definitely have the technological know-how. Some reports say that if they decided to go down this path, it would take three to six months. So, it would be very important for us to maintain a very effective assurance.

COMMANDER McDANIEL: With regard to influence versus withdrawal, I'm always a proponent of influence and sharing our ideas, sharing what we believe. I will tell you the same impacts of an alternative vocation -- you get the same -- in terms of negative messaging, you'll get that with the sea base as well. You know, I know recently Admiral Blair had an op-ed piece on sea basing, and I don't agree with him, because you cannot replicate your capacity or capability on strictly a sea base. Functionally, you're much better off, and if you have the option you want to have your facilities ashore. So, I still say, you know, keep Bahrain a major non-NATO ally; be their friend; engage -- but these other options if messaged correctly, because we routinely engage with Qatar right now, we routinely engage with Kuwait. Shuaiba used to be the camp's spearhead. New Doha Port is ongoing right now. I mean, just to say we have redundancy. We're not going to start moving capacity capabilities there, but to have that infrastructure in place if we did need to move is a good redundant capability to have from a planner's perspective. And I think if you message it properly it won't detract in their stock in the other GCC countries.

I have read a little bit on, you know, Qatar's trying to assume a greater role and have a little bit more moxy, if you will, in the region. So, this could create some rift between the two. You know, Saudi's the big brother kind of them all, but I think if you message it correctly you could manage that properly.

SPEAKER: Thank you all for your comments. I have a question for Captain Penoyer.

Some of the likeminded countries that have engaged in regional territorial agreements -- and I'm thinking of things like Mercosur and ECOWAS and ASEAN and even the Gulf Cooperation Council. How effective has that been in terms of executing a policy or seeking cooperation when it comes to maritime territoriality and how they resolve their issues?

CAPTAIN PENOYER: Right, thank you for that question -- the one I was dreading. (Laughter)

So, regional cooperation on that level -- the U.S. Coast Guard has a long history set of interactions with the regional North-Pacific Coast Guard forum; ASEAN -- the list goes on and on and on. And that works, because where human activity is concerned, governance inherently has an interest in linking up. So, as an example, the United States Coast Guard works incredibly closely with the agencies that are in charge from the PRC over fisheries, environmental -- and it has always been, thus a little known fact that the Coast Guard patrol boat fleet in the Arabian Gulf, which we used to call by another name, routinely interacts with the government of Iran, because when you're doing search and rescue, everybody's your friend. It's just a fact. So, we get along great. That sort of governance interaction, these regional forums are extraordinarily helpful at.

Now, if you change the context and say what have these regional forums done for sovereignty resolution -- I'm going to go back to my earlier point -- sovereignty is about land, and they don't do that nor do, in the general sense, governance fleets govern other governance fleets. It's really not cricket to board, for instance, a Coast Guard cutter of another nation. They're sovereign vessels. We don't do that. That is a different activity, which usually goes under a different title in conflict. It falls under a different set of international laws. And I would say that in that regard, I find that that discussion of using these regional forums to resolve these territorial disputes sort of misses the movement a little bit. We're talking about old school territorial disputes -- order disputes, I-own disputes -- these have been going on for a long time. They're governed by customer law there, not by maritime territorial governance forums.

MR. SINGER: Got time for one last one. In the corner over here.

SPEAKER: Captain (inaudible) and the Military Fellow at the Council on Foreign Relations.

Brian, a quick question for you. If I heard you -- if I understood you correctly what you just said, that sovereignty issues need to be decided before you can exercise governance. And in light of that, you know, I'm more interested in your perspective on International Sea Bed Authority, which is a body of the law of the sea, because this area that we have traditionally called the maritime commons, and now another term is coming up which I recently learned about but has probably been around a bit longer than that, is common heritage of mankind to refer to the resources that are available not beyond 200 miles in the (inaudible) but beyond 350 miles now so we can actually drill for oil in 10-12,000 feet of water. So, especially in light of the fact that we're not signatory to the law of the sea, how do you see the International Sea Bed Authority, which is an attempt at international governance, really no matter how you look at it. How do you see their future?

CAPTAIN PENOYER: Yeah, okay, so that's the second question I was dreading.

So, the International Sea Bed Authority -- I'll back off from that a little bit and start with these areas where there have been, in the past, many areas where nations agreed to disagree about territorial sovereignty. They will not go to -- you know, first law of military operations is, you know; don't start an unlimited war for limited objectives. And so in many cases these squabbles are not worth fighting about. And, yet, even though there's no agreement on sovereignty, there is a recognition, and in fact this has happened in the East China Sea that we have other interests -- fisheries are the usual one -- that need governance. People are going to go into these fisheries areas and extract the living resources. And particularly in that region, that's not trivial. That resource is very important to the national interest. So, typically, even without a sovereignty agreement we can agree to how we're going to regulate these fisheries. And, in fact, in almost all cases that I'm aware of in the East China Sea, even where the nations are desperately in disagreement about who owns the sovereign claim of territory, they actually get along pretty well, on fisheries governance in particular but, as we were talking about earlier, with governance forces there is sort of an incentive to work together. Whether it's pollution response, smuggling, immigration -- any of these issues -- you really want to know your counterpart pretty closely.

So, with regard to sort of the really deep high seas, 350 and out, kind of, there is no sovereign claim of any one nation. I think that's the next big issue to be addressed, because the framework for jurisdiction over those things is based in an era when a ship was the sovereign territory of that nation, and that nation's law applied on that ship, which is all good and well if we're talking about a conventional pointy hold device. As we've seen in the Gulf of Mexico, these things progressively look less and less like the age of sail over time. And when you start talking about crawling around on the bottom of the ocean collecting mineral nodules, I think that that will stretch the limits of that principle.

I think that what will emerge from this is an evolution of customary international law. That's what happens. We set new precedence. We figure these things out one case at a time.

You asked about the law of the sea, my single, strongest argument in that regard is that if you are not at the table, you are not a part of the discussion of how that precedent will be set. I think that that puts us in a weaker position than we might be otherwise.

MR. SINGER: It's interesting. I've been here -- this is probably the ninth panel where someone has said ratify law of the sea. And the last person to say it was George Shultz. So, you're in good company. (Laughter) The problem is no one is listening. But that isn't the case, hopefully, with the rest of the research that we've had the opportunity to enjoy here today.

So, I hope you'll join me in three levels of thanks. One is to the speakers, not just on this panel but also on the other panels; the second is to the folks in the back of the room, particularly Brendon, who have helped organize this forum; and then, finally, to all of you for coming out. We really appreciate you joining us.

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