071012 NATIONAL DEFENSE INDUSTRIAL ASSOCIATION, AIR FORCE ASSOCIATION AND RESERVE OFFICERS ASSOCIATION CAPITOL HILL BREAKFAST FORUM WITH DON COOK, DEPUTY ADMINISTRATOR FOR DEFENSE PROGRAMS, NATIONAL NUCLEAR SECURITY ADMINISTRATION, ON NUCLEAR WEAPONS SUSTAINMENT (For additional information on NDIA/AFA/ROA seminars contact Peter Huessy at phuessy@afa.org).

[This is a rush, unofficial transcript provided by National Security Reports.]

MR. PETER HUESSY: I want to thank you all for being here today. My name is Peter Huessy. And on behalf of AFA, NDIA and ROA, I want to thank you for attending this in, I believe, the 20th of our seminar series on homeland security, missile defense and nuclear deterrence.

I also want to let you know that on the 12th of July, which is Thursday, General Robert Kehler, the Strat Commander, will be speaking. But remember, he will be speaking over at the Reserve Officers Association of America at 8 o'clock. So remember, that's where we're going to hold it at. Please reserve your spot if you're going to be coming.

Also next week, we have three seminars. Dave Trachtenberg is speaking on the 18th, Barry Blechman on the 19th, and Admiral Benedict, who is head of SSP, is going to be speaking on the 20th of July. You know the Secretary of the Air Force, Mike Donley, has got a date now for July 25th to speak. And then following that is Jim Miller on the 26th of July. And General Formica, who was going to speak later this week, has had to change his date, and that will be August 3rd. General Formica, head of SMDC down in Huntsville will be speaking then.

We're honored today to have Dr. Donald Cook, who is the Deputy Administrator for Defense Programs at the Department of Energy at the National Nuclear Security Administration. He became the fifth deputy administrator in June 2010. He's responsible for managing the U.S. nuclear security enterprise of laboratories and manufacturing facilities.

Prior to this position, he was managing director and chief executive officer of the atomic weapons establishment in the United Kingdom from 2006 to 2009. He was accountable for AWE's performance on the contract with the U.S. administrator of defense for the United Kingdom, which includes support of the Trident warheads and development and sustainment of the capability in nuclear weapons design, engineering, development, manufacturing, qualification, assembly, transport, support in service and decommissioning and dismantlement and disposal. With an annual budget of $1.2 billion, he managed along with a workforce of 5,000.

Part of our effort will be we'll add a number of seminars with some of Dr. Cook's colleagues at NNSA and Mr. Myer's colleagues at DTRA, which we will do. And then we will have also a panel featuring General Smolen (ph), Ambassador Brooks and Henry Sokolski to look in more detail and more depth at the NNSA enterprise and the DTRA enterprise with respect to verification of nuclear materials around the world; the four year lock down of nuclear material as well as better verification. So with that introduction, I also want to thank our colleagues from the embassies, I believe, of Russia, Britain and Israel who are here today. I want to thank you for being here today and welcome you here.

And Dr. Cook, again, on behalf of our corporate sponsors as well as ROA, AFA and NDIA, I want to thank you for coming down here to speak with us today. Would you give a warm welcome to Dr. Donald Cook?

(Applause).

MR. DONALD COOK: Well, it's a pleasure to be here. Good morning. I'm going to – my plan of attack is to talk for about 15 minutes and then open up an opportunity for you to have questions. I trust that what I'm going to say in the talk will probably trigger some question, but you can think about some in addition.

The first thing I want to say is if you came here today to hear my remarks on nuclear proliferation, you'll be disappointed. I'm going to talk mostly about nuclear sustainment. The original title for these remarks was "Thoughts on Stockpile Modernization." But I didn't disagree with the suggestion that the title of the talk be "Nuclear Proliferation," not "Nuclear Nonproliferation," "Nuclear Proliferation, Nuclear Sustainment." And it's my view that those two are linked and I'll get into it before too long, describing that view.

So on nuclear sustainment specifically, what I'm going to be addressing is sustainment of the nuclear deterrent warheads that the United States has. Now, of course, sustainment of both the NNSA workforce, by that I mean our workforce at the labs, the plants and the Nevada site, and the infrastructure, are required to sustain the warheads. All of that is really NNSA's job.

Now NNSA and the Department of Defense have shared accountabilities for the nuclear deterrent. The DOD responsibilities include: establishing military requirements; designing, developing, testing and producing the delivery systems; securing and maintaining the nuclear weapons when they are in DOD custody; and overall accountability for the operations of nuclear weapons systems. Those are the DOD responsibilities.

NNSA responsibilities include: maintaining the safety, the security and the reliability of the current stockpile; conducting research, development and engineering for any changes required to the stockpile, including life extension programs; and producing the nuclear weapons themselves. Very few people around the country actually seem to know that NNSA does all the design, all the development, all the qualification and all the production of nuclear warheads, and then puts these warheads in the custody of the Department of Defense when they are deployed.

Before getting into the NNSA roles, though, I'm going to reiterate a view articulated in a number of places, that the U.S. is not the only nation which relies on the U.S. stockpile for deterrence against nuclear attack. The nature of the U.S. stockpile is such that it provides an extended deterrent against nuclear attack for more than 30 other nations that are allies of the United States. So the conclusion then is that without sustainment of the U.S. nuclear deterrent, nuclear proliferation may be more likely, not less likely, if the credibility of the U.S. deterrent ever came into question. In other words, not only are adversaries of the United States watching very carefully to see whether we are continuing to sustain the deterrent, but in fact U.S. allies are watching us closely as well.

And their actions will depend on what they see, what they hear and what they know. So in this regard, providing greater transparency into our plans and our actions for nuclear sustainment -- providing greater transparency can have a beneficial impact on U.S. security and on global security. Additionally, increased transparency by other nations with nuclear stockpiles could have the same effect. The New START Treaty between the United States and the Russian Federation provides transparency to the U.S., to our inspectors who have boots on the ground in Russia.

Now within the Departments of Energy, State and Defense, and this is something that Peter alluded to from a discussion that he and I had some time ago. And Ed Helminski sitting here knows this as well, because there was a four-part discussion at the last deterrence conference. I, Anne Harrington, Rose Gottemoeller and – it would have been Kenny Myers, but Ronny Faircloth (sp) – spoke about this intersection between transparency, verification technologies, where Anne Harrington has the lead.

And I have the lead on transparency as head of defense programs. State has the lead on treaty requirements and Defense has the lead on actual verification. We're working these within the administration because we recognize that all of these have to be integrated in order to be effective. And in future addresses, you may hear more about that.

So now I'd like to turn to the NNSA responsibilities that I laid out for nuclear sustainment, and I'll do them one at a time. The first topic was maintaining the safety, the security and the reliability of the U.S. stockpile. The surveillance program, along with scientific and engineering tools that were put into place in the last two decades, have become the core today of the annual assessment of the condition of the stockpile.

In September, 20 years will have elapsed since the last underground nuclear explosive test. The last was "Divider" and it was conducted on September 23, 1992. So it has been very nearly now 20 years since we've stopped testing.

The stockpile stewardship program has clearly succeeded in putting into place the capabilities for quantitative understanding of weapon aging and the effects of weapon aging. The main tools for high energy density science, such as the National Ignition Facility at the Lawrence Livermore Lab, the Z-machine at Sandia and the Omega laser at the University of Rochester, are in place. They're being heavily used to gather data. And that data is used to not only in the purpose of discovery, but it's used to benchmark quantitatively the computational codes that we have.

Then there are the tools for primary assessment, such as the Dual Axis Radiographic Hydro Test capability at the Los Alamos Laboratory, and the contained firing facility at Livermore. Also, sub-critical experiments at the Nevada national security site, the former Nevada test site, are all in place and all used for primary assessment. In addition to those, computation platforms and algorithms have also been developed and updated on regular schedules, and they've enabled a better understanding of the effects of weapon aging. Actions based on that information are taken to keep limited life components absolutely up to requirements.

Now as computations have become more powerful, the use of adjustable parameters has been replaced by scientific knowledge and understanding. That's very important. It's this understanding that forms the basis for the life extension programs across the U.S. stockpile.

Recently you will have noticed the Sequoia computer at the Livermore lab was ranked as the world's fastest super computer. It has just been assembled and tested, but already it's being prepared for undertaking the work of simulating the behavior of nuclear weapons.

The second topic I'd like to turn to is conducting research, development and engineering for changes to the stockpile, including the life extension programs. Well, I have a few facts. You made have heard them before, but if not you can put them together.

The first fact is today we have the oldest stockpile we've ever had. The average age of the warheads in our nuclear deterrent stockpile is now beyond 26 years and moving to 27, something I track very carefully. Another fact is we also have the smallest stockpile since the Eisenhower administration.

And if you look at the 1950s, Eisenhower was from '52 to 1960. If you look at the buildup of weapons and the very high levels, and then the reductions over time, and then you draw a horizontal line between 2012 where we are all the way over to the left, you will intersect with the Eisenhower administration. So now I'd ask you to put those two together, the oldest stockpile we've ever had, and the smallest since the Eisenhower administration, and you can begin to understand the task at hand for conducting the life extension programs.

Up until very recently we expended more effort in understanding the effects of warhead aging, because we had to, than we did in resetting the clock, meaning remanufacturing warhead components and modernizing the safety and security features -- and particularly the safety and security features. "In the first two decades after nuclear testing ended, we built the power tools of stockpile stewardship." That's a quote from Chris Deeny (ph), one of the people in my area, and I like it because it's true. It's easy to understand.

But now over the next two decades, the next 20 years, we must apply those power tools to modernization of the U.S. nuclear deterrent broadly defined. And by that, when I talk about the deterrent, I list four things and always in the same order to describe what the deterrent for America really is: nuclear deterrent.

The first is people. The second is the stockpile. The third is the infrastructure, and the fourth is the business practices. I'll also say we're not very good at the fourth – probably something that's fairly widely known and we're spending a good deal of effort and critique to learn how to be better.

Regularizing the activities in stockpile stewardship and management in such a way that we use the capabilities that we must have and must retain, is an effective manner of continuous capability maintenance and renewal. In other words, when it comes to a specific capability set we should use it or lose it. For several years we've been moving from a capacity-based nuclear security enterprise infrastructure toward a capability-based infrastructure.

What I mean by that -- for example, a capacity-based manufacturing plant might have several parallel assembly lines. Intel plants around the world will have half a dozen assembly lines for making chips, for example, all doing the same thing in parallel; whereas a capability-based manufacturing plant would have a single assembly line. It might have some spare tools to pop in if one of the tools goes down, but that's the difference between a capacity-based system and a capability-based system.

Recent decisions by the Nuclear Weapons Council have now increased the scope of the weapons life extension program. The W-76-1 sea-based warhead continues in production. The B-61-12 nuclear bomb will move to the engineering and development phase, which we call phase 6.3. It's going to be the consolidation of four families of that bomb, and that's one of the oldest weapons we have in the American arsenal. The life extension options for the W-78 land-based warhead and the W-88 sea-based warhead will move into the feasibility study, an option down-select phase, or phase 6.2, with a strong emphasis placed on the use of common components, adaptable architectures and interoperability between ICBM and SLBM platforms.

Another fact coming up that you may wish to remember, with decisions made in the last year, greater than 80 percent of the U.S. bombs and warheads are now moving through the life-extension process, beyond the initial phase of concept development, or phase 6.1. It's the intent of NNSA, DOD and U.S. Strategic Command to improve the safety and security features of each weapon type and to extend the life of these weapons, while not creating new nuclear weapon capabilities. In doing so we expect to sustain a highly specialized technical workforce and we expect to develop and sustain the capabilities, the facilities and the infrastructure that are essential for meeting stockpile requirements.

Now I'm going to turn to the third thing that I mentioned with regard to the NNSA's responsibilities, and that is producing the weapons themselves and maintaining the science, technology and engineering, or ST&E, for shorthand infrastructure. So as I just mentioned, over 80 percent of the U.S. bombs and warheads are now moving through the life extension process, beyond the initial phase of concept assessment or 6.1. I use that as a demarcation point because we can do work on concepts frequently, but when we move beyond that we're really beginning to move through the life extension process in a very serious, intentional and dedicated way.

Now this movement with that fraction of America's nuclear deterrent is possible because significant progress has been made in modernizing the nuclear security enterprise infrastructure. That comment will probably strike you as strange, given what you read in the press, and so I'm going to elaborate on it a bit and in a very pointed way. The new Kansas City complex, something we call KC-rims (ph), is now more than 60 percent complete. Basically we're rebuilding the entire Kansas City plant and we're more than 60 percent of the way through.

Ground breaking for the High Explosives Pressing Facility, something we call HEPF, at Pantex was achieved in August of last year in Amarillo, and construction is on schedule and on budget. At Sandia mesa, which is everything small: microelectronics, optics, photonics, MEMS; is fully operational. The

Neutron Generation Production Facility is in place. And the Z refurbishment is also complete with high quality data being obtained on plutonium and other materials.

At Y-12, the Highly Enriched Uranium Materials Storage Facility, something we call HEUMF -- and I dare you to try and pronounce that acronym in any reasonable way – HEUMF is completed and it's in use while the engineering design of the uranium processing facility continues. All NEPA activity for UPF is complete. The record of decision has been issued, along with an updated environmental impact statement for the Y-12 site. For any of you who have done any work in this area, you know how large an accomplishment of all those things is.

At Savannah River the tritium extraction facility was completed and tritium extraction is underway. At Los Alamos, DART (ph), which I've already mentioned, the Dual Access Radiographic Hydro Testing Facility, one pulse on the first arm, four pulses on the second arm. That means getting five pictures during an implosion of a weapon configuration with surrogate materials, no plutonium used. DART is fully complete and generating extraordinarily high quality data.

Also at Los Alamos, the CMRR, that stand for Chemistry and Metallurgy Research Replacement, a part of that project, the Radiological Lab, Utility and Office Building, or RLU, will be – again, I challenge you. I don't know where we get these acronyms. They make technical sense but they're very hard to pronounce. RLOUB is the way we say it – a bit out of order. But RLOUB was completed on time and under budget.

At Livermore the National Ignition Facility is fully in place with all required diagnostics and it is generating high quality data for inertial confinement fusion and for the weapons science program. At Nevada, the Criticality Experiments Facility, something we call CEF, is complete and generating data. That was nearly a 10 year effort to move four reactors from Tech Area 18 of Los Alamos into a higher security and more modern part of the infrastructure, and we chose to put that in something called the Device Assembly Facility at Nevada. Also at Nevada, the Jasper Gascon (ph) experiments using small samples of plutonium are, again, in operation and conducting regular experiments. Some critical experiments at Nevada and a facility called U-1A are also generating high quality data.

At Pantex, the thing called SS-21, Seamless Safety for the 21st Century, a major improvement in safety, is now fully instantiated and all weapon types can be maintained, in addition to providing surveillance data. Disassembly of all retired W-62 warheads – they use to fly on Minuteman missiles – that disassembly was achieved a year ahead of schedule, two years ago. Last year, disassembly of all retired B-53 nuclear bombs – very big, very old bombs – was achieved safety and a full year ahead of schedule.

So although our plutonium and uranium construction projects get most of the air time in the press due to both their cost and their impact, the infrastructure of NNSA for nuclear sustainment is considerably broader than these. We are investing heavily in the infrastructure and it is improving.

The last thing I want to turn to is future nuclear sustainment challenges and opportunities. As we examine future technical options for stockpile sustainment independent of the numbers of bombs or warheads deployed at any time, there are some things visible now in 2012 that will be different from the 1970s and 1980s when our present nuclear weapons were designed and produced. Another fact that seems to be little known, even in the community that pays attention, is that we use 1970s and only early 1980s technologies in the systems that we have in the stockpile today. The one exception is the W-76, which we are rebuilding and refurbishing. But all the other technologies stem from that time ago. That's nearly 35 years ago.

So some things have changed. Build lots in the future are going to be smaller. Common mode failure must always be avoided, but greater use of common components and technologies across weapons systems can improve component maturation.

By that we mean component maturation in a thorough, rigorous way using technology readiness levels, component readiness levels, technology maturation levels. When we say tech maturation or component development these days, that's what we mean, knowing when we're going to get to a certain point of readiness that can be the basis for technology insertion into a life extension, and knowing how much it is going to cost and at what level of performance the component will be. So the common mode failure must be avoided, but greater use of common components and technologies can improve the component maturation and the confidence in the components also, while reducing cost.

Interoperability of systems through miniaturization of safety and security features appears possible now, unlike 35 years ago. And I recall for the W-78 the hope at that time was that there could be interoperability between an ICBM and an SLBM system. The technologies were too large. They were too heavy. In some respects, they were too differentiated and that was 35 years ago. This has changed.

So even though build lots are smaller, and in part because of that, it may be possible now to regularize the workload across the NNSA sites so that the safety, security and reliability of the U.S. systems can be improved more regularly than once every 30 years. For a moment, I'll describe what I mean by regularize

When we do a life extension program, we frequently respond at NNSA to the military requirements and we work with the military all the time: DOD, StratCom, Air Force, Navy. And we frequently look at, when is the life extension needed? We say, the first production unit is needed by this time and then all the systems are needed by that time.

Then we attempt to get the work authorized and get the budget for it. And there's a long cycle of budget requests by the administration. And NNSA has four committees, two authorizing and two appropriating, two in the House and two in the Senate. I think you know all the bit.

But getting concurrence on these things is not simple. And so frequently it will take one or two years to do that. And for some reason in the past we didn't plan that one or two years in our schedules. And as a result we wind up seeing a first production unit date that hasn't changed.

We're marching in your timeframe. Time goes left to right, so we thought we were going to start here. We didn't start a year later, we start like two years later and now the time scale to FPU -- if I were to draw it more starting like this – we go one year and two year and now we've only got this time.

So we immediately ramp up an engineering design team. We work preparation for production very hard. And, you know, part way in ramping up the team there's a clear statement.

Now wait a minute, we have to freeze the design almost immediately because the FPU hasn't changed. So if we could find a way to regularize – and then after we get the design work done, the design team is whittled away. It's reduced and it kind of decays for a period of time until the next life extension program comes along.

With my own team, I've said we will never again think again of one LEP at a time. We'll think about the entire stockpile. The numbers are smaller. The build lots are going to be smaller.

We're going to use more modern technology. Those technologies are lighter. They're smaller. We can fit them into the existing aero-shells, bomb bodies, ballistic systems – can carry them because they've carried heavier systems.

This is doable. But to get there we need to have a regularized workforce, regularized capability and design at the labs and manufacturing at the plants and technology maturation. And it actually all has to work together because we have a capability framework, not a capacity framework.

What that means is, if you've got an assembly line you need one of every tool. When something breaks the whole assembly line stops, unless you make up more bits and pieces on the front-end, but you can't make up more bits and pieces from the back-end, something missing at Pantex. And so finding effective ways to regularize the system is deeply important for the future.

Now while it would be too large a step to state that a different approach to life extension program planning and execution would certainly reduce technology obsolescence -- would reduce the ramp-up and the ramp-down of design and production teams, and reduce the cost, duration, and scope of the design and certification process – while it's too large a step to say it would certainly do that, there is a reasonable expectation that a more consistent flow of work through the NNSA enterprise, of relevant work utilizing and refreshing essential critical skills, could maintain the workforce at a higher state of capability and of performance. Within all of the elements of the nuclear deterrent, and all things that are important for nuclear sustainment, the most important piece is still the workforce. In the end, it all comes down to the people. That hasn't changed.

I appreciate the time you've taken to come here today. I thank you for listening and I hope you have some questions. Thank you.

(Applause).

No questions?

MR. : Sir, the administration has said repeatedly that it wants to see a responsive infrastructure. How would you define responsive infrastructure and do you think we have it? What capabilities still need to be acquired?

MR. COOK: First, that's a very good question. I trust everybody in the room could hear, even in the back? Okay.

I'll answer the point directly. Yes, we need a responsive infrastructure. Part of the reason I went through the list of things that we rarely hear about because CMRR and certainly our five-year deferral of CMRR nuclear facility, part of the CMRR project, our acceleration of the uranium processing facility, our commitment of the B-61, those make – those take up a lot of the air time.

When you look at much of the infrastructure that we've been paying attention to and modernizing, those are equally important parts of a responsive infrastructure. And I won't say what's more important because, once again, if you treat what we're doing in a crude way, as a factory – I'm both a physicist and an engineer. I have no problem with being either. But if you treat what we're doing as a factory and you say that piece is more important than this piece, and so you don't invest in this piece, pretty soon the assembly stops and it doesn't matter how much you spent on this other piece that might have been really attractive and really in the press. The system breaks. And so responsive infrastructure, in my mind, is one that can undertake the work on schedule with reasonable predictions of budget and reasonable accuracy at the point in time. I'll remember to comment on the life extension process if there's another question. There's something I want to say about that and what we're going to do with it.

But a responsive infrastructure would be an infrastructure that can meet the demands of the time. The words responsive infrastructure have become associated with this range of 50 to 80 pits or CSAs, the secondary assemblies per year. That isn't the best definition. I know that's kind of the definition, but if you look at what we do responsive infrastructure is the men and women in the design teams, preparation for engineering and development, the actual qualification that we do even before we start serious manufacturing tends to be something that's often missed up front except for those who have been through it before and then they're thinking about it right up front when something comes (up ?). So I tend to give a fairly broad answer. If you have a follow-up question, feel free?

MR. : I guess where I sit we look at responsive infrastructure and we look at the NPR that said, if we have a responsive infrastructure then the administration can take significant reductions in the hedge force. So I guess my follow-up question is, what's that responsive infrastructure? Are we there or do we need – are there any key particular capabilities that (have to have ?) the full factory, the full line?

MR. COOK: Sure. Well let me answer the nugget of the question, no we're not there yet -- but it's yet. So there's a sense that the way we could account for uncertainties in technical performance of weapons systems, that is preparing -- having a hedge against technical failure. Or, we can account for uncertainties in geopolitical considerations where a nation might have hostile interests in the U.S., ramp its stockpile up, and we would likely have to do the same thing.

That's the reason in general , as you know, on why the term responsive infrastructure comes out. I tend to broaden the term, and that is a responsive infrastructure is one that if we want to do a life extension program we can actually conduct it. We can actually execute it. And so this comes down quite a bit more to decisions that are made and whether those decisions can be made early and whether they can still – whether they're good decisions.

So as an example, the W-76 -- and what I'm going to say is unclassified, of course – the W-76 is being pursued with pit refurbishment. The B-61 is as well. When we come to the next LEPs, the W-78 and the W-88, we are quite likely – we've not made the decision yet – but quite likely going to chose a combination of pit reuse and newly manufactured pits, but of existing design, so not do anything illogical or risky or outside of the underground test base that we have and love so well.

Our ability to do that -- if we have an ability to do that – I would say that's a responsive infrastructure. And it's a combination of different things. Personally, I am more concerned about our uranium capabilities right now than our plutonium capabilities.

More than either of those, I have concerns about our high explosive capabilities. That's why we're proceeding with the high explosive pressing facility. And this is why we've chosen, when we look at all the work we need to do, to accelerate UPF while we take a five year deferral on CMRR-NF.

And the reason that's possible is we actually make pits not in CMRR-NF or in the present CMR, that's where we do analytic chemistry and (mitro ?) characterization, but we make the pits in PF-4. So if you look at the investments in PF-4, they're considerable because that's where we make the pits. So I've tried to give a fairly complete answer, Drew, and state that responsive infrastructure almost by definition is whether that – if we have it and the infrastructure that we have will be able to respond to our military needs for warheads, our engineering needs for technology development, our scientific needs for understanding more about the fundamental nature of these weapons systems.

MR. : Dr. Cook, that was an impressive summary the infrastructure (changes ?) that have occurred over the last five years. How are we doing as compared to our peer nations that also have a deterrent, from an investment perspective?

MR. COOK: I won't comment on what other nations are doing, although I will say we have, as is well known, close ties and joint working with the United Kingdom. I know that one particularly well because I was over there for four years. We also have reasonably close ties with France.

With regard to the Russian Federation I'm just exceptionally pleased to say I was with the U.S. lab directors and the Russian Federation weapons lab directors in Russia three weeks ago. A year ago we began again the weapons lab directors – we call it the lab-to-lab – many people at the labs working between the American labs and Russian Federation labs on scientific, engineering technologies, on threat reduction, on monitoring systems to determine radiation and where it is, and those kinds of things. A year ago we did the first lab-to-lab in -- seven or eight years had passed since they stopped. And this year we did the second one just one year later and this time in Russia. So I hope that we are moving down the path of transparency.

Now I absolutely would like to have more transparency on where Russia is going with its deterrent. I'd certainly like to have more transparency, I mean for my own eyes, on where China is going with its deterrent. There are other nations, too, but those are two of the P5 and I tend to treat them somewhat differently.

It's my own personal view, and the reason I said I as head of defense programs, am leading transparency. I don't believe that I will get transparency into what other nations are doing unless I lead it for America. And I have no concern leading in transparency for America because of what I said in my formal remarks.

Our allies are looking at what we do. The 30 nations protected by America's nuclear deterrent are looking at what we do, and I will even say at least as hard as our adversaries. Because if America's extended nuclear umbrella, or whatever you wish to call it, isn't there; or if all they see us doing is nothing or arguing about what we're going to do, that is very bad for the future. And so this, again, this combination of transparency, verification, technologies, which Anne Harrington leads, treaty requirements which Rose Gottemoeller leads, and verification that Kenny Myers leads; to me that's a very important core of things.

And in having discussions in Russia we found actually quite a similar view, working with Rosatom and with the labs. I just have to say I'm encouraged. Things could go belly up in a heartbeat, but right now I'm encouraged.

MR. : The House authorization bill contains a number of provisions that would enact various reforms at NNSA, more of less eliminating federal oversight of the labs – (off mic) – contracts – (off mic). Do you have any thoughts as to if those provisions became law if they would make things worse or – (off mic)?

MR. COOK: I'm going to be careful in the response, but I'll give you a general response. You know, formally the administration has developed a statement of administration policy that deals – it's the vehicle in which the Department of Energy addresses things that come out in the authorizing or appropriating bills before there's a budget bill actually passed. With regard to the relationship that we have and where we are between NNSA and its labs and plants – I didn't say my labs and plants but you can tell I feel that way because if I'm not looking out for them and if I'm not a very demanding customer then they're unlikely to shape up in the way that I believe they need to – and they're actually in pretty good shape right now.

So with regard to partnership, it's my desire to see a very strong GO-CO oriented partnership. These sites have been government owned for 60 years and they've been contractor operated. Getting to the point where we have oversight of these, which is eyes-on, hands-off oversight, has been my aspiration for several years, and it remains so. It was my aspiration when I worked on the lab site for many years. We're taking some steps to make progress in that regard, but I'll allow the statement of the administration policy to answer your question.

MR. : Do you have any thoughts on safety and oversight and the ability of NNSA to make DOD – (off mic).

MR. COOK: With regard to what has happened in the last 20 years, I'd say we have seen a major step forward at all of our labs and plants with regard to attention to both safety and security. So the performance actually has been very good.

If you look year upon year now for the last, I might say three or four years, you might make it half a dozen, the kinds of failures, the kinds of problems that are occurring are much smaller than the kinds of problems that occurred 20 years ago. So what that suggests to me is it's a reasonable time to think about how we should, from the federal side, the federal entity, provide the appropriate oversight and governance of the labs and plants. But I don't want to be silent. Things are, in my opinion, much improved in the way that the MNOs are running the places for us as the government. I'm not dissatisfied with the way that's going.

MR. TODD JACOBSON: It's become clear that the National Ignition Facility at Livermore is not going to meet its mission goals this year. How much does that concern you on a near-term level, but also as you kind of look into the future and need ignition facilities to do the maintenance of the stockpile and answer some of the questions that are still looming? When does that become a real concern, that you're not achieving ignition, for the future of the stockpile and understanding of – (off mic)?

MR. COOK: I'll try to address this by talking fairly fast. There are lots of points you – it's factual that the milestone for alpha heating in a capsule was missed by Livermore. That milestone was due at the end of June.

This is the last year of the National Ignition Campaign, which was a three-year effort put in place with enhanced management controls at the end of NIF construction. And it was intended to be a bridge to full NIF operations, so we're now entering the last quarter of the last of three years. And the milestones were – they weren't back-end loaded. They were at different times but they've been adjusted as time has gone on, not adjusted because they had to be adjusted from technical reasons but we actually wanted some other experiments in stockpile stewardship science, some experiments in (chalk ?) physics, chalk breakout, (equations of state of ?) materials to be done on NIF.

And we asked that those be put in the schedule and they did get put in the schedule. So that already answers the question that might be asked, is NIF useful for the stewardship program. The answer is absolutely, extraordinarily useful, and not just for ignition.

But to answer your question, the milestone to achieve ignition is due at the end of this fiscal year. The fact that the alpha heating milestone was missed means logically that the risk to achieving ignition has gone up significantly, and I think we've said that. We've also informed the committees of Congress.

When I take the broader, longer view, though, we're going to pursue a scientific and engineering program. It will have greater breadth than just ignition when we cross the boundary of October 1. And to an extent, I have a belief that the prospect for ignition, given that it's not achieved at the end of September if that's the case, rather than just barreling on and trying to shoot more often and with higher laser power – that's being done right now to really test the limits of our understanding and the limits of the predictive codes.

We have, however, already learned that our predictive codes for inertial fusion – I'll say this in a soft-spoken voice but very directly – they're not predicting the full extent of reality. So on the one hand somebody might say well, that's terrible. What does that mean for the weapons program, for example?

I come at this from the point of view of saying the construction of NIF was done so well, the diagnostics are so complete, the tightly resolved data that we're getting out of the NIF diagnostics are of such high quality, that it's not a question that the codes are not predicting reality. We know that. We absolutely know it.

So now we're at the point where we hope to be with all experimental capabilities, that the data is so good that the data can constrain the codes, because that's the only way we really make improvement in the codes. Now at the same time, you know Sequoia is the world's fastest super computer. So I think it's really time to pay attention to using the output NIF already achieved to now begin developing the codes to a further extent.

And we use Z-omega. We use DART. We use capabilities at U-1A and Jasper and CEF to do all that. That's why I went through the list.

I think it's going to be, you know, the experimental capabilities advance. And we see something, we learn something we didn't understand, then we move the predictive capabilities forward and get better prediction; not cat-and-mouse, but step-by-step in a scientific method is where we're going. I do not believe that ignition is impossible on NIF. So those are two negatives.

Let me state that clearly. I think ignition is possible on NIF if you can find the way. But I don't think we've found the full extent of the way yet. But we know kind of when we're going to achieve it.

MS. : I was wondering if you have an impression or if you've done any work with the Chinese and if there are any Chinese (transparency measures ?).

MR. COOK: The question is, have I done any personal work with the Chinese? And my answer is no, but my good colleague Anne Harrington has. My other good colleague Rose Gottemoeller has. And the question is, are there any transparency measures?

With regard to what we are not only attempting to do now but doing with P5 -- that means America, Russia, China, Britain and France -- we are attempting to make a step-by-step way in this transparency and verification. So in fact, China has taken the lead for the development of a glossary, something pretty important for the P5. Anne Harrington could tell you much more. Rose Gottemoeller could tell you much more than I can. But as far as the administration, we're working these areas quite thoroughly. I hope that answers part of the question.

MR. HUESSY: Thank you, Dr. Cook, that was extraordinary.

(Applause).

We will have Dr. Cook's remarks on the AFA web site. And after we've looked and cleaned up some of the Q&As we'll have that also transcribed. In fact, if you go to the AFA web site under each of the speakers only one transcript, I think it's Gary Samore, that we have not posted at his request, but all the others are there. And if you have any questions, either get in touch with Sarah or myself if you would.

And also on the AFA web site, on the right-hand side, it says Peter Huessy's breakfast seminar series. You can go to my new blog and you can also go to something called "Peter Huessy's Corner" which is where I post speeches and articles of other people that I think are important. That is also there.

So if you have any questions, we'll have Dr. Cook's piece posted -- the text of his speech fairly soon, and then Rick is going to transcribe – we'll do that. All of you remember General Kehler is Thursday, but it's at the ROA building up on the fifth floor. We'll be checking in people between 7 a.m. and 7:30 a.m. so you can come that early.

Again, Dr. Cook, thank you very much for your wonderful presentation. Thank you.

(Applause).