

Remarks

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Thank you all very much for the warm welcome.

My objective this afternoon is to focus briefly on the third leg of the New Triad responsive infrastructure. Industry rep on this panel. I've spoken about Industrial Base issues with DSB Threat Reduction Advisory Council (TRAC) and I appreciate this forum.

Much analytical work has been done in this area, and I know of few better documents on the manpower aspects than the Work of Commission on maintaining U.S. nuclear weapons expertise in March 1999. Both ADM Chiles and Dr. Barker were members of that Commission. The Commission's recommendations on how to assure a responsive defense infrastructure and a strong industrial base are only more relevant six years later. And they have been quite valuable to me in shaping some of the observations from an industry perspective that I want to share with you here today.

The New Triad is, of course, a good description, but at present part of it is still an aspiration. Nearly four years since the concept was announced, it remains a highly useful framework, linking and integrating our nuclear offensive and defensive forces with our conventional war-fighting capabilities. It also reminds us that all of these capabilities must be supported by an effective and responsive infrastructure—if we are to respond effectively to future challenges. Without these linkages there would be even greater danger that our nuclear capabilities and infrastructure would atrophy.

Similarly, without the holistic approach of the New Triad, our emerging missile defenses—might seem a specialized adjunct to, rather than an integral part of our overall national security posture. And, without the New Triad's larger framework, we might be tempted to take our military industrial and production base, our infrastructure, and especially the nuclear community workforce with its' very special expertise for granted. After all, the temptation to take it for granted is powerful. It has always been there for us in the past. Indeed, our "arsenal of democracy" was a key to victory in World War II. But with the changes of the post-Cold War era, taking our military industrial capability for granted, without devoting deliberate attention to ensure its adequacy, will put us on a long, slippery slope leading to some nasty surprises down the road.

I want to preface my remarks by stating upfront that we've made substantial progress in turning the concept of the New Triad into the *reality* of a New Triad. Our nuclear and conventional power-projection forces already existed when the New Triad was envisioned, of course. Now the new mandates given to our combatant commanders – and I'm thinking particularly of the STRATCOM Commander – help link these capabilities in planning and operational terms. Similarly, our progress in fielding missile defenses – initially nationally, but as a step to an integrated global missile defense capability – have

lent substance to the second leg of the New Triad. So, too, has the STRATCOM's mandate to assume operational responsibility for our integrated missile defense capabilities, again linking them in planning and operational terms with the New Triad's other legs. But the responsive infrastructure leg is a somewhat different matter. As one of the industry representatives on the panel, I want to emphasize that from my perspective this third leg of the New Triad represents a real challenge.

First, there are several different facets to responsive infrastructure. There's an industry component and there's a government component. There's certainly a manpower component, and along with that a sustainability component.

At the same time, there are multiple demands that need to be met to achieve truly responsive and effective infrastructure. It has to be robust, not fragile. It has to be renewable, but it has to also be sustainable. And above all – in a tightly constrained environment where priorities are shifting and resources are dear – it has to be affordable.

The challenge, then, is to satisfy each of these demands while integrating all of the different components of a responsive infrastructure. But how can this be achieved?

A few weeks ago I attended a conference hosted by US STRATCOM – a meeting of (Center for Strategic and International Studies) CSIS's Project on Nuclear Issues, PONI, that aims to help develop and sustain a new generation of military and civilian strategic thinkers and leaders on nuclear issues. PONI creates a forum where this new generation can interact with some of the best minds and some of the most senior officers in the strategic field. STRATCOM's Commander, General Cartwright, attended our PONI Conference for the entire day – a reflection of the importance he attached to the PONI project for which, incidentally, my company has provided seminal support. Our discussions ranged across the entire spectrum of issues connected with the New Triad, and addressed both the components and demands on a responsive infrastructure that I just mentioned. Since the conference, I've devoted some thought to these responsive infrastructure issues – chiefly because I was struck by the fact that, during our wide-ranging discussion in Omaha, we actually touched on several characteristics of the responsive infrastructure "puzzle". However, our forum was limited so we didn't fully put the "puzzle" together. We didn't quite come up with an integrated approach for achieving responsive infrastructure that I'd like to discuss this afternoon.

That's what I'm going to try to do today – not to propose, full-blown, a "holistic" solution to the responsive infrastructure challenge, but to pull together in an integrated way several of the mandatory characteristics in an effort to point the way toward a truly integrated solution to this complex "third leg" of the New Triad.

One place to start is a troubling problem for our nuclear forces – the fact that there will likely be very limited production quantities – somewhere between "low rate" and "no rate" in many cases – for components of, particularly, nuclear weapons and delivery systems. This makes it very difficult now, more difficult in the future to keep contractors such as Northrop Grumman, our suppliers, and the scientists and engineers of the nuclear

community “in the game.” In the days of the Cold War Triad, the numbers of systems in development and numbers of fielded units requiring support was sufficient to keep long-standing defense suppliers fully occupied. There was little need to worry that when a critical system or subsystem was required, a range of experienced suppliers could be counted on to be available to supply it. Yet today, that is not a sound assumption. The defense-production base has contracted greatly. In the nuclear systems area, it will contract even more dramatically in the future, presenting us with very serious, fully predictable challenges.

Likewise, legacy institutional commitments – themselves often relics of the Cold War – persist perhaps beyond the point when they are justified. Yet it is simply too difficult, even painful to make the necessary contractions to arrive at a sustainable institutional infrastructure, perhaps too politically charged. But if we’re going to achieve the responsive infrastructure called for in the New Triad, then clearly it’s time to think beyond the familiar boundaries. We need to put aside some old institutional habits, take a careful second look at some “sacred cows,” and question a few fundamental assumptions.

To that end, let me offer five concepts of my own – geared toward sustaining our nuclear weapons infrastructure, but with larger defense-wide implications as well.

You may notice that there is a common theme which all these concepts serve to varying degrees. Within the nuclear community the concept of a critical mass is well understood. There is a related concept that is very important in creating a sustainable responsive infrastructure – that is the concept of a critical level of activity. If we don’t achieve that, I am convinced that we will not be able to retain the most important element of our responsive infrastructure, our workforce.

First concept: It is worth questioning whether the United States has to rely solely on domestic sources. That is, do we really need full end-to-end research and production capabilities for our nuclear weapons and their components inside the U.S.? The answer, I believe, is “no.” In the post-Cold War world, I suggest we may be able to sustain a more responsive infrastructure if we don’t rely solely on domestic sources.” In short, we should consider to more fully integrate with – not duplicate – our allies’ capabilities, especially the British.

There are a number of available examples, here’s one. In the nuclear weapons arena, the UK has a “pit” manufacturing capability for nuclear weapons. In the U.S. we continue to grapple with the pit production issue. We debate over building a new production capability, knowing that production numbers and rates are likely to be very limited in the future. Why not look to our combined needs and perhaps even rely on the UK’s capability for this key component of our nuclear weapons inventory, especially over the near term. If our closest ally has a perfectly good production facility in this area or others, why shouldn’t we seek an agreement and an institutional arrangement to rely on allied production? Such a move would obviously free the U.S. resources to address other critical needs.

Second concept: It seems we should consolidate and rationalize existing facilities. Do we need more than one U.S. weapons design laboratory? Our nuclear-design labs were established for an era in which we needed competitive-design approaches to design and build truly optimized weapons. The idea then, and a critical one, was to seek the most elegant, miniaturized, nuclear weapons required for our Cold-War-type arsenal. Yet neither of those conditions applies any longer. Both National Labs still do excellent work – but two labs doing excellent but very limited work are not necessarily better than one doing more work.

There are many other cases of redundancy, where more consolidation would go a long way toward achieving the concept of a critical level of activity. Concentration of activity is vital when we look to the future and to the challenges of sustaining the ability to do very demanding specialized activities at dramatically reduced rates. I believe steps like these are mandatory if we are to create an affordable and sustainable, as well as a responsive, nuclear infrastructure for the long term.

A third concept: To satisfy conditions of affordability, sustainability, and robustness, we should aim to standardize products. Specifically, it would be very desirable if we could aim for weapons designs based on a single new robust, reliable common design for our nuclear weapons. (Call it the RRW) Reliable Replacement Warhead. Variants of this weapon could then be built if and as necessary. They could be adapted or tailored to the type and characteristics of the delivery vehicle, to the nature of the target, or to the weapons effects desired to be maximized on delivery.

A similar but broader approach could be taken for other components of our strategic weapon systems, such as rocket engines and for missile boosters. Why not deliberately emphasize commonality and develop common boosters – at least common first and second stages – that could be used both for weapons deliveries of all types and for defensive interceptors and government and commercial space launches?

Another underlying principle here ought to be modularity – a principle that can be extended to a “common-core” approach for weapons systems, and especially for new boosters. We could then go a step further. The problem of limited production quantities is exacerbated when we develop systems such as boosters for either military or civilian but not both applications. From an industry perspective I have spoken previously about and am concerned about our production base for solid rocket motors, and in an era of sharply reduced procurement quantities, – more commonality, more modularity, will yield large payoff as we look to the future and sustaining our industrial base. Again, the principle is creating the critical level of concentrated activity – that we need. Another question, could we achieve greater innovation – could we better keep up with the cutting edge of technology – by strategically adopting and utilizing commercial-off-the-shelf – COTS – components, for instance for guidance and electronic systems? Consider the contribution this could make to the affordability, robustness and sustainability of our industrial infrastructure. Commodity, modularity, increased use of COTS – all of these I

believe are characteristics of future weapon systems that promote a sustainable responsive infrastructure – primarily because they all tend to concentrate rather than fragment critical activities.

My fourth concept addresses a notion you hear a lot about lately. It is said – particularly in connection with nuclear weapons production – that we don't actually have to build weapons in order to sustain our capability to build weapons. I don't think it is that simple.

We forget sometimes, in surveying big trends in the industry and within the nuclear community, that it still comes down to the individual choices people make in their own careers. Our industry has to operate in ways that maintain an experienced, skilled, and committed workforce. And as an old hand in the industry, I can assure you there is only one way to sustain a capacity to develop and to build systems over the long term – and that is to develop and to *build systems*.

If you want to recruit “the best and the brightest” . . . if you want to maintain a motivated, technically proficient and competent workforce . . . and if you want to hold onto skilled managers, scientists and engineers, then it's not enough to have everyone primarily preparing to do this important job. They have to be allowed to do it. If they aren't, I believe such very talented people will make different career choices. We will have no responsive infrastructure.

So I suggest a “responsive infrastructure” requires that we conceive, develop, and fund long-term programs for development, for low-rate production and testing, at the least of components and subsystems, and eventually of a Reliable Replacement Warhead as the common core of our future nuclear weapons family. Otherwise, I believe the talented, motivated people we're depending on will have strong motivations to move on, in pursuit of other more interesting and challenging, and more secure career opportunities. And in short order, it will become impossible to sustain our scientific, technological and production base.

All of which leads to my fifth and final concept about “responsive infrastructure,” namely that across the nuclear community our primary product – the deliverable that we seek to sustain – is the capability to do something vital. This is a new and very different concept for many – not exactly how we're accustomed to thinking about contracts and the relationship between government and industry or between Government customers and suppliers within the nuclear community. Yet it offers a much better description of reality, and we would do well to adjust our thinking and terminology accordingly: A robust nuclear infrastructure that has the capability to respond to the needs of the future is what we seek, how to attain it is the challenge, but this capability, in a contractual sense, is the deliverable.

When we talk about a capability as the deliverable instead of hardware quantities or software lines of code, it requires a new mindset. We must avoid what I call the old B-2 bomber trap – simply dividing the total development and production cost of a program by

the actual, greatly reduced, number of aircraft procured – leading to the conclusion that each aircraft on a recurring cost basis cost a senselessly astronomical sum. Especially in the case of deliberately maintaining “long-term LRIP,” as I have discussed. What the government will be buying in the future is a sustainable and renewable development and production capability especially in the nuclear area instead of hardware quantities or software lines of code. The real deliverables will not always be obvious from the numbers and quantities, and the resultant “unit costs”. In fact, the term “unit costs” within a sustainable and responsive future infrastructure should always be in quotation marks.

Once we recognize this, it becomes clear that we must pay for the capability just as we would for any other deliverable. What does that mean in practice? It means that each “product” that rolls off the production line – each booster, each weapon – will have to bear a higher increment of fixed costs. In economists’ terms, our price will never get very close to covering simply the variable cost of the *n*th unit of production, due to the high fixed cost component we must pay – and we will be consciously paying to maintain this industrial or technological capability. This will require a new mindset, and some new disciplines.

So there you have some concepts on the challenge of achieving and maintaining a “responsive infrastructure.” The challenge is so complex; it involves so many different variables and constraints, that I believe it must be approached in a multi-faceted but integrated way. It must be approached realistically – always remembering what it takes in the real world to attract and retain a capable, motivated defense workforce. And it must be approached boldly, with a willingness to stop doing business in conventional ways, and to consider the entirely new possibilities that the “New Triad” demands.

Thank you.

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