

Maintaining Advantage in a Multi-Polar Nuclear World: Declining Resources and Effectiveness of the New Triad Interim Report on Declining Resources

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A. Background

The recently completed study for the Office of Net Assessment (ONA) entitled *Maintaining Advantage in a Multi-Polar Nuclear World* identified ten key insights. Of those insights, Technology Strategies & Alliances (TS&A) has been tasked with further exploring the following two:

- **Declining U.S. Nuclear Expertise** – The experienced people that formed the backbone of the U.S. nuclear capability – to include doctrine, strategy, design, development, operations and maintenance – during the Cold War have largely retired, and those that have served post-Cold War are generally no longer employed in these roles.
- **Diagnosis of the Implementation of the New Triad** – The evolution of the geopolitical environment has outpaced the rate of implementation and deployment of new programs and other initiatives necessary to operationalize the New Triad; consequently, the nuclear capabilities available to the U.S. today are those of the Old Triad.

This interim report will address the findings to date derived from the Nuclear Infrastructure Forum on Wednesday, 29 November 2006, as well as from literature search, assessment and analysis and a series of interviews held with the primary stakeholders involved in management and planning for the U.S. nuclear infrastructure. The interview process is ongoing. The results of these interviews will be folded into the Final Report.

TS&A has held interviews with a number of the stakeholders in the U.S. nuclear infrastructure to include members of:

- The National Laboratories
- Senior Executives at the Defense Threat Reduction Agency
- J-8 of the Joint Staff
- DOE NNSA

These interviews are ongoing, with several interviews at OSD, the Joint Staff, DTRA and DOE/NNSA already completed. Interviews we are now working to arrange include members of the U.S. Strategic Command, the National Laboratories, and the Assistant Secretary of Defense for Nuclear and Chemical and Biological Defense Programs.

B. Findings

The Forum discussions along with the questionnaire responses from the Forum participants provided the following:

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- While the infrastructure still has significant gaps and shortfalls, there have been substantial improvements since the epoch of the *Chiles Report*. Major remaining gaps are largely in the production areas and in the doctrinal and strategy areas for deployment and operations.
- The DOE laboratories are attracting young intelligent scientists; however, they are generally not able to participate in key design and production activities since few such activities are available. Therefore the perpetuation of knowledge, understanding and skills are no longer accomplished by doing but through emulation and simulation.
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- Absent a clear definition of what the DOE nuclear infrastructure should produce, it is unclear what the infrastructure ought to be. An infrastructure that is intended to preserve multiple future options is expensive.
- In *Complex 2030*, DOE has provided a strategy for the nuclear infrastructure which calls for preservation of the same nuclear capabilities to be applied against the same targets delivered with the same delivery vehicles. There is a question as to whether this is an appropriate objective, or simply the best that can be obtained politically.
- DOE proposes to implement *Complex 2030* by consolidating capabilities, making them more interdependent and providing additional staff oversight. There are other means such as competition and red teaming which several studies have concluded are more effective than the application of additional oversight.

Forum Responses

The Forum participants were asked to respond to a series of questions. The following provides a summary of those responses:

The Chiles Commission Report – Characterize the adequacy of the nuclear infrastructure now and through the year 2030. If there are or will be infrastructure shortfalls, what are they and how would you characterize them? What critical skills are required?

DOE: By all accounts, the DOE bureaucracy is alive and thriving. If anything, the nuclear weapons laboratories and the production facilities could probably do with a little less help and oversight from DOE.

DoD: The DoD appears to be in free-fall in matters pertaining to nuclear infrastructure. The nuclear portfolio continues to be diluted with other WMD issues. Indeed, it is telling that the Nuclear Weapons School will soon be

renamed the Threat Reduction University (or some such thing). The Defense Atomic Support Information and Analysis Center (DASIAC) has already been renamed the Defense Threat Reduction IAC (DTRIAC).

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The trace of the former Defense Nuclear Agency is now integrated into DTRA, but it is only a shadow of itself compared to what it was in the 60's, 70's and 80's. DTRA continues to raid the nuclear programs for funds that are being revectorred to the more important current priorities.

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Laboratories: The Labs appear to be relatively healthy, although there may be specific areas where there are some problems. The science-based stockpile stewardship program has been successful in attracting a new generation of nuclear weapons experts. In part, these new players appear to have been attracted by the new world-class experimental facilities developed under stockpile stewardship. Working for LANL, LLNL, and SNL still appears to have a certain cache. In recruiting, the Labs still have a sufficient volume of applicants to allow them to be choosy, but their job offers are also being turned down by some of the best applicants.

Production Facilities: The problem here stems from the lack of definition of required capacity. Until NNSA is told how many weapons will be life-extended, how long the actual pit life will be, and how many new weapons (RRW) will be built, the uncertainty regarding the adequacy of the weapons facilities and how to fix them will remain high.

Do you believe there are sufficient resources available to address the shortfalls?

The DOE has enough funding for everything except fixing the production complex. Currently, there are not enough people to draw on, but it should be possible to attract enough people with the requisite skills through a focused recruiting process.

Are organizations able to meet their recruiting goals?

In general, the National Laboratories are able to meet their recruiting goals. They offer competitive salaries and they have world-class research facilities to attract

the interested student. The DoD and the Production Facilities have a tougher time because nuclear technology is now seen as a dead-end area, salaries are lower, and it is largely viewed as a maintenance program.

What is the state of the graying of the workforce?

There is question that the demographics of nuclear specialists across all disciplines are graying. However, in part this is due to the large workforce that was required to support Cold War requirements. As this workforce continues to retire, it is being replaced by a younger but leaner workforce that may be sufficient for anticipated needs (depending, of course, on what those needs turn out to be).

In your opinion, did the 1999 Chiles Commission appropriately characterize the decline of expertise? Has the situation changed significantly from what it was in 1999?

Generally, the Chiles Commission characterized the state of the nuclear community correctly back in 1999. Since then, the Stewardship Program has been successful in recruiting a new class of scientist who will in most cases be able to backfill the positions left open by retirees. The RRW program will be less demanding in terms of the scientific skills required to design and build such weapons. Also, the Labs have been successful in their recruiting campaigns, using their world-class experimental facilities as a strong attractant.

What new initiatives and/or programs have been made or planned since 1999?

The nuclear enterprise is looking for a raison d'etre to maintain its technical and production capabilities. The life-extension programs have gone into high gear over the past 5 years.

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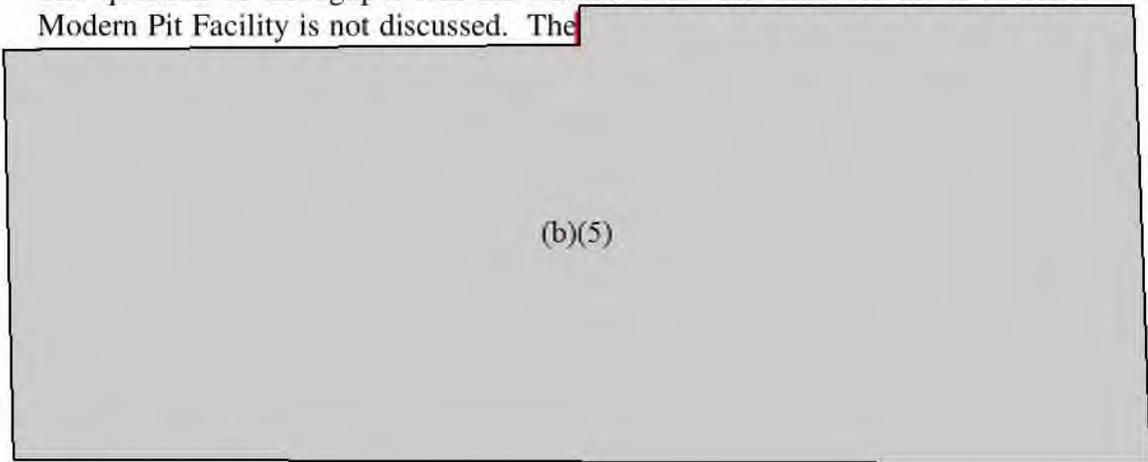
Complex 2030 – To what degree does the recently released “Complex 2030” adequately address the shortfalls in the U.S. Nuclear infrastructure today and through 2030?

What elements are, in your judgment, adequate?

The basic strategy is reasonable. The future complex will be focused on developing RRW, refurbishing a limited number of legacy weapons, and accelerating the dismantlement of the Cold War Stockpile. The vision for Pantex and the potential surge capacity provided by the DAF at NTS is well conceived. The role of the science-based experimental assets (LANSCE, UIa, etc.) appears to be well thought out. The security footprint reductions planned for the major production facilities also make sense.

Which elements are inadequate; that is, implementation of the 2030 strategy will leave what gaps?

The business case for Complex 2030 has not been made and probably cannot be made effectively in the absence of a definitive long-term nuclear requirement. The question of throughput remains unanswered. The issue of the need for a Modern Pit Facility is not discussed. The



How does affordability relate to these gaps?

Congress does not appear to be supportive of any new production facilities, in part because of cost, and in part because of the lack of a definitive requirement. They would likely support downsizing and modernization of existing facilities.

How would you propose to modify the “Complex 2030” strategies to adequately deal with the infrastructure issue as you see them?

The key is to first develop a plausible business case based on future requests.

While many of these comments have been validated through the literature searches that TS&A has completed, as well as in conversations we have had to date with others familiar with these issues, there are some who hold alternate views of the relative strengths and weaknesses of various elements of the infrastructure. TS&A will continue to gather information on views regarding the state of the current infrastructure, and will summarize its findings in the Final Report.

To date, TS&A has met with the following individuals:

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C. Next Steps

TS&A will continue with interviews of the major stakeholders. These include meetings with:

- STRATCOM, members of the Commanders Staff and J-8;
- Sandia Laboratory to meet with members of the laboratories to obtain their first hand view of the resource issues; and
- J-5 to discuss the policy aspects of these issues.

D. Major Insights

Three lines of thinking and implementation of the Declining Resources are emerging:

1. There has been some positive progress in attracting young persons to the lab; since the Chiles Commission Report, which found diminished resources across the Nuclear spectrum – from the design to production and all of the elements in between.
2. There are those who believe that the laboratories are in better condition to move forward with design and development than the production facilities, which have not been adequately utilized or maintained; and
3. The development of the Reliable Replacement Warhead (**RRW**) Program will allow the nuclear community to exercise all aspects of the infrastructure with the exception of testing of weapons. While it is not completely adequate to maintain all aspects of the infrastructure, it is at least a start to being the infrastructure back from its decline.

A question that TS&A is now exploring is whether Complex 2030 and RRW carried forward will provide the kinds of options and choices to best serve the US and its allies, if /when there is a clear need for new nuclear weapons in order to assure, deter, dissuade, and defeat.