



INTERVIEWS

This section of the *Journal* brings an interview with Thomas Scheber, former Director of Strike Policy and Integration, Office of the Secretary of Defense, on the ability of the U.S. nuclear complex to produce a new nuclear weapon. The interview discusses National Institute for Public Policy's 2015 report, *Assessment of U.S. Readiness to Design, Develop and Produce Nuclear Warheads: Current Status and Some Remedial Steps* by Mr. Scheber and the late John Harvey. The interview also addresses continuities and changes within the nuclear enterprise since the publication. While the National Nuclear Security Administration now has workable plans to modernize the fabrication facilities, implementation is still years away, creating a concern given the deterioration of the national security environment in the past decade.

An Interview with Thomas Scheber, former Director of Strike Policy and Integration, Office of the Secretary of Defense

Q. Your and John Harvey's report Assessment of U.S. Readiness to Design, Develop and Produce Nuclear Warheads: Current Status and Some Remedial Steps was published by National Institute about a decade ago. In which areas have you seen most progress? Which areas remain as problematic as ever? Have any of the areas examined in the report gotten worse over the past decade?

A. Prior to answering the question, I would like to acknowledge my co-author and colleague John Harvey, who passed away last year. We brought different backgrounds and perspectives to the 2015 report, and that made the report a better and a more complete product.

We looked at U.S. ability to produce and develop nuclear warheads, which is a relatively narrow sliver of the total scope of the nuclear enterprise's role. There are two aspects of this important issue: 1) people, their skills and judgement; and 2) facilities that are ready for production.

Some of the tasks that the nuclear security enterprise is currently performing are important but do not contribute more immediately to the task we examined. An example can be work on nuclear fusion, or work on life extension programs (LEPs). LEPs do not exercise all the critical skills needed to design and develop a new nuclear warhead.

On the positive side, DOE/NNSA now has a workable plan to modernize the fabrication facilities (e.g. plutonium parts, uranium parts, and tritium production). However, for plutonium parts, the current plans are limited in planned capacity to the Congressional mandate of 80 plutonium pits per year (ppy). We have not made much progress in the actual implementation. Plans are a start, but they are not sufficient for resilience which requires standby readiness and capacity. We are still years away from the production facilities being in operation.



DOE/NNSA has made progress in completing the initial round of LEPs, including the W76 LEP, which was perhaps the most comprehensive LEP to date. However, it took 11 years to complete and was fraught with difficulties. The downside is that this LEP, and others, exercised only engineering and assessment skills, but not design and developments skills needed for new design.

Regrettably, we have gone another decade without any new nuclear warhead developments. This means we are not creating opportunities for the next generation of weapons designers and producers to challenge them and help them develop skills to assess warheads in the current stockpile and the judgement to develop new designs in the future.

Q. The United States is entering an extremely challenging geopolitical era, potentially needing to simultaneously deter two nuclear peers and a few lesser nuclear powers. Is our nuclear weapons infrastructure prepared to deal with this contingency? And if not, what steps should the government take to prepare it to be able to respond to the challenge?

A. Given the uncertainty, we cannot know what surprises lie ahead. What will our adversaries do? Russia, China and others have each had nuclear infrastructures that have operated continuously for the past three decades while the U.S. infrastructure has been largely inactive. What kind of arsenal will we need to deter and, if necessary, defeat them? That is why we need a flexible and resilient infrastructure—to be prepared to respond.

If a geopolitical challenge arises, or if there is a failure in our nuclear stockpile, it will be very difficult to respond to it in a timely manner. We have not produced a new nuclear warhead in about 40 years. We have had limited warhead development programs, e.g. the Reliable Replacement Warhead Program, to exercise nuclear warhead development and design skills, but there was varying political support for these programs and none was completed.

Currently, we have plans to recapitalize our nuclear infrastructure, but we are years away from those plans being fully implemented. We need a sense of urgency and sufficient resources provided to get these plans to completion. Congress seems to understand the need for resilience and appears to be more helpful now than in years past. For example, in the Stockpile Resilience Program, Congress has given the National Nuclear Laboratories an explicit authorization to explore new designs. The program should be maintained and expanded.

Q. In your experience, what has been the most significant obstacle to attaining a sufficient readiness to design, develop, and produce nuclear warheads?

A. In the past, there were three main obstacles to attaining a sufficient readiness to design, develop, and produce nuclear warheads: 1) the hope by many senior officials that the nuclear arsenal would continue to be reduced and the United States will not need to build new nuclear warheads, which has led the Department of Energy to always plan for modernized

nuclear facilities with insufficient capacity for the future; 2) the lack of consensus on the need for the infrastructure recapitalization, especially during the 1990s; and 3) confusion at the national nuclear laboratories regarding what it is that they were allowed to do (e.g. people thought they were not allowed to even think about new warhead designs and that doing so would break the law, which was not the case).

In the past 6-8 years, a consensus has emerged on the need to support these issues and viable recapitalization plans are in place; however it has taken quite a long time to get there.

Q. Are there any areas of concern identified in the 2015 report that the National Nuclear Security Administration (NNSA) has managed particularly well?

A. The good news is that we now have plans to recapitalize the key production facilities. Additionally, the NNSA deserves the credit for completing the W76 and other LEPs. While the Government Accountability Office wrote a scathing report on the W76 and B61 LEPs and argued that the programs have not even achieved all of their goals, it was a monumental cross-laboratory and plant effort. The changes made to the W76 warheads would almost certainly have required a confirmatory nuclear test during the testing era.

Q. In the age of polarization on many foreign policy and defense issues, what are some areas of a strong bipartisan consensus in this area and how does it translate to funding and programs? (Can be a consensus on good or bad issues).

A. Both the 2009 and 2023 Strategic Posture Commissions wrote consensus reports. Both commissions were bipartisan in composition and both highlighted the need to be able to develop new nuclear warhead designs and recapitalize facilities. The 2009 Commission was split on the issue of nuclear weapon testing, while the 2023 report did not discuss the issue at all. The two reports are similar in many respects and that should tell us that when both political parties invite experts to look into the facts regarding the nuclear infrastructure, the experts will come to agreement on substantive issues.

Q. We are entering a period of significant nuclear weapon modernization. What does it mean for the nuclear warhead complex?

A. The period of significant nuclear weapon modernization means that there are likely to be problems ahead. In the past, we have focused on LEPs, and as soon as they were done, the production facilities again were silenced. We have not exercised all new development skills and have not conducted a sufficient number of experiments to train designers to examine the edges of the nuclear design envelope.

The United States has not had serial production of nuclear warheads in over 35 years, and that means we should expect to have problems reestablishing any new production, as would be the case with any industry that was shut down and then tried to resume production. Even minor changes to well tested production capabilities can produce

unexpected problems (think for example the Boeing and its recent problems with 737 aircraft caused by flight control upgrades and production line changes). We should not expect that it will be easy to reestablish production lines for new types of warheads.

Q. What more must be done to ensure maintenance of the capabilities and skills of our people (i.e., the intellectual capital of our nuclear warhead designers and engineers) should a (future) president decide that the nation's security requires fielding of a new nuclear warhead or modification of an existing warhead to provide a new military capability?

Our recommendations from 10 years ago are still relevant today. The laboratories need to conduct more experiments. For example, the Dual-Axis Radiographic Hydrodynamic Test Facility in Los Alamos still does only about 4 experiments a year. We should be conducting about one hydrotest experiment a month to give warhead designers more opportunities to explore the edges of the design envelope. Also, we still conduct only one subcritical experiment a year at the Nevada Test Site.

We should be doing prototyping, including perhaps even flight testing. One important, but underappreciated, aspect of this work is the close integration needed between the NNSA and the Department of Defense teams. Without new design activity, the integration skills needed are not fully exercised. Such interactions would help develop skills necessary for developing military specifications for new weapon systems.

Q. What do you think about the Strategic Posture Commission's recommendations for the nuclear enterprise infrastructure?

I endorse all the findings of the 2023 Strategic Posture Commission regarding the nuclear infrastructure. The only criticism that I might make is that the recommendations in the commission report are rather general, and they are not prioritized (unlike in the 2009 Strategic Posture Commission Report). The other issue that I might note is that the potential need for nuclear testing was not mentioned at all in the 2023 report. But the 2023 report is excellent, and many of its findings point to a long-term bipartisan consensus that future administrations can build on to improve the responsiveness of the nuclear enterprise.