November 2010 Update to the National Defense Authorization Act of FY2010
Section 1251 Report
New START Treaty Framework and Nuclear Force Structure Plans

1. Introduction

This paper updates elements of the report that was submitted to Congress on May 13, 2010, pursuant to section 1251 of the National Defense Authorization Act for Fiscal Year 2010 (Public Law 111-84) ("1251 Report").

2. National Nuclear Security Administration and modernization of the complex – an overview

From FY 2005 to FY 2010, a downward trend in the budget for Weapons Activities at the National Nuclear Security Administration (NNSA) resulted in a loss of purchasing power of approximately 20 percent. As part of the 2010 Nuclear Posture Review, the Administration made a commitment to modernize America's nuclear arsenal and the complex that sustains it, and to continue to recruit and retain the best men and women to maintain our deterrent for as long as nuclear weapons exist. To begin this effort, the President requested a nearly 10 percent increase for Weapons Activities in the FY 2011 budget, and $4.4 billion in additional funds for these activities for the FY 2011 Future Years Nuclear Security Plan (FYNSP).[1] These increases were reflected in the 1251 report provided to Congress in May 2010.

The Administration spelled out its vision of modernization through the course of 2010. In February, soon after the release of the President's budget, the Vice President gave a major address at the National Defense University in which he highlighted the need to invest in our nuclear work force and facilities. Several reports to Congress provided the details of this plan, including: NNSA's detailed FY 2011 budget request, submitted in February; the strategy details in the *Nuclear Posture Review* (NPR) (April); the 1251 report (May); and the multi-volume *Stockpile Stewardship and Management Plan (SSMP)* (June). Over the last several months, senior Administration officials have testified before multiple congressional committees on the modernization effort.

The projections in the Future Years Nuclear Security Plan (FYNSP) that accompanied the FY 2011 budget submission and the 1251 report by the President are, appropriately called, 'projections.' They are not a 'fixed in stone' judgment of how much a given project or program may cost. They are a snapshot in time of what we expect inflation and other factors to add up to, given a specific set of requirements (that are themselves not fixed) over a period of several years. Budget projections, whether in the FYNSP and other reports, are evaluated each year and adjusted as necessary.

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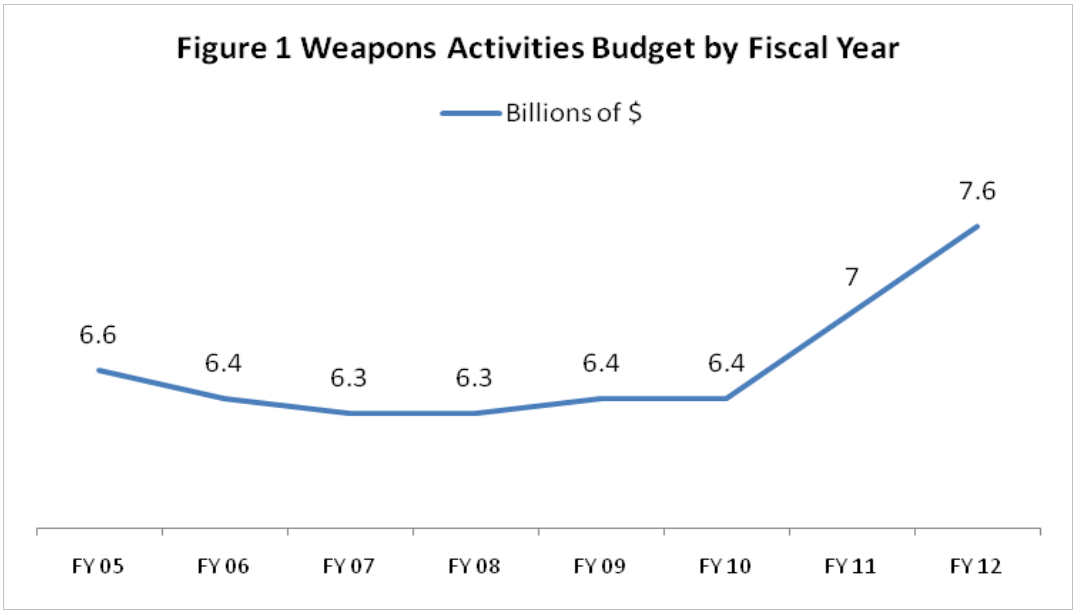
[1] After adjustment for the transfer of the Pit Disassembly and Conversion Facility from the Weapons Activities account to the Defense Nuclear Nonproliferation Account the increase over the FYNSP is actually $5.4 billion.

Indeed, planning and design, as well as budget estimates, have evolved since the budget for FY 2011 was developed. Notably, stockpile requirements to fully implement the NPR and the New START Treaty have been refined, and the NNSA has begun executing its *Stockpile Stewardship and Management Plan* (SSMP). This update will discuss, in particular, evolving life extension programs (LEP) and progress on the designs of key facilities such as the Uranium Processing Facility (UPF) and the Chemistry and Metallurgy Research Replacement (CMRR).



Note: FY 2011 level is the President's budget request; FY 2012 is the planned request.

Based on this additional work, and the development of new information and insights, the President is prepared to seek additional resources for the Weapons Activities account, over and above the FY 2011 FYNSP, for the FY 2012 budget and for the remainder of the FYNSP period (FY 2013 through FY 2016).

Specifically, the President plans to request $7.6 billion for FY 2012 (an increase of $0.6 billion over the planned FY 2012 funding level included in the FY 2011 FYNSP). Thus, in two years, the level of funding for this program requested will have increased by $1.2 billion, in nominal terms, over the $6.4 billion level appropriated in FY 2010. Altogether, the President plans to request $41.6 billion for FY 2012-2016 (an increase of $4.1 billion over the same period from the FY 2011 FYNSP[2]).

Given the extremely tight budget environment facing the federal government, these requests to the Congress demonstrate the priority the Administration's places on maintaining the safety, security and effectiveness of the deterrent.

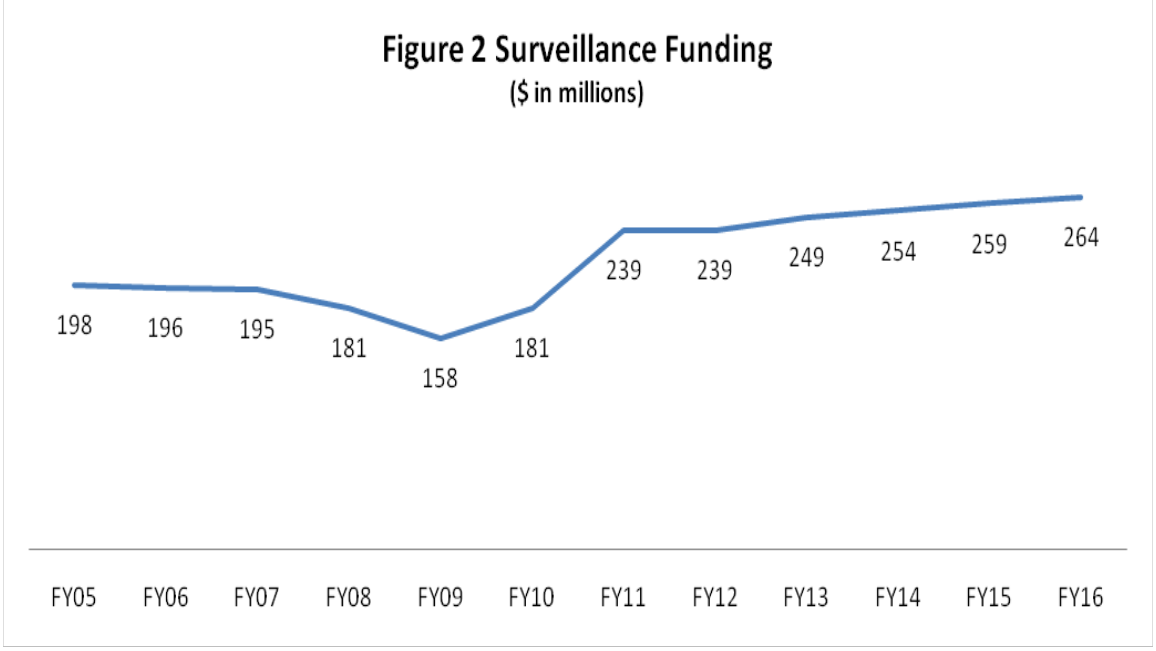
[2] As extended in the 1251 Report

3. NNSA -- Program Changes and New Requirements since submission of the *1251 Report*

A. Update to Stockpile Stewardship and Sustainment

Surveillance – Surveillance activities are essential to enabling continued certification of the reliability of the stockpile without nuclear testing. Surveillance involves withdrawing weapons from deployment and subjecting them to laboratory tests, as well as joint flight tests with the DoD to assess their reliability. These activities allow detection of possible manufacturing and design defects as well as material degradation over time. NNSA has also received recommendations from the National Laboratory directors, the DoD, the STRATCOM Strategic Advisory Group, and the JASON Defense Advisory Panel that the nuclear warhead/bomb surveillance program should be expanded.

In response to this broad-based advice, NNSA has reviewed the stockpile surveillance program and its funding profile. From FY 2005 through FY 2009, funding for surveillance activities, when adjusted for inflation, fell by 27 percent. In recognition of the serious concerns raised by chronic underfunding of these activities, beginning in FY 2010, the surveillance budget has been increased by 50 percent, from $158 million to $239 million. In the FY 2012 budget, the President will seek to sustain this increase throughout the FYNSP. This level of funding will assure that the required surveillance activities can be fully sustained over time.



Weapon System Life Extension -- The Administration is committed to pursuing a fully funded Life Extension Program for the nuclear weapons stockpile. The FY 2011 budget submission and the NPR outlined initial plans. Since May 2010, additional work has further defined the requirements to extend the life of the following weapon systems:

- **W76** – The Department of Defense has finalized its assessment of the number of W76 warheads recommended to remain in the stockpile to carry out current guidance. The number of W76-1 life-extended warheads needing completion is larger than NNSA built into its FY 2011 budget plans. NNSA, with the support of the DoD, has adjusted its plan accordingly to ensure the W76-1 build is completed in FY 2018, an adjustment of one year that is endorsed by the Nuclear Weapons Council. This adjustment will not affect the timelines for B61 or W78 life extensions. The LEP will be fully funded for the life of the program at $255 million annually.

- **B61** – NNSA began the study on the nuclear portion of the B61 life extension in August 2010, six months later than the original planning basis. To overcome this delay, NNSA will accelerate the technology maturation, warhead development, and production engineering that is necessary to retain the schedule for the completion of the first production unit in FY 2017. An additional $10 million per year has been added to the FY 2012 FYNSP for this purpose.

- **W88 AF&F** – The *1251 Report* addressed the intent to study, among other things, a common warhead for the W78 and the W88 as an option for W78 life extension. Early development of a W88 Arming, Fuzing, and Firing system (AF&F) would enhance the evaluation of commonality options and enable more efficient long-term sustainment of the W88. Approximately $400 million has been added to the FY 2012-16 FYNSP for this purpose.

- **Stockpile Systems and Services –**NNSA is now seeking to execute a larger program of stockpile maintenance than assumed in planning the FY 2011 budget and than projected in the *1251 Report*. The additional work includes an increase in the development/production of the limited life components to support the weapons systems. Consequently, the Administration plans to request increased funding of $40 million in FY 2012 for the production of neutron generators and gas transfer systems. NNSA and DoD are aligned for the delivery of essential hardware to ensure no weapon fails to meet requirements.

New Experiments — NNSA's current science and surveillance activities have been more successful than originally anticipated in ensuring the reliability of our existing stockpile without nuclear testing. As we continue to develop modern life extension programs, however, NNSA and the laboratories are considering even more advanced methods for evaluating the best technical options for life extension programs, including refurbishment, reuse and replacement of nuclear components. One such effort of interest that could aid in our efforts includes expanded subcritical experiments designed to modernize warhead safety and security features without adding new military capabilities

or pursuing explosive nuclear weapons testing. This program might include so-called "scaled experiments" that could improve the performance of predictive capability calculations by providing data on plutonium behavior under compression by insensitive high explosives. In order to thoroughly understand this issue, to assess its cost-effectiveness and to ensure that there is a sound technical basis for any such effort, the Administration will conduct a review of these proposed activities and potential alternatives.

B. Updates to Modernization of the Nuclear Weapons Complex – Modernization of the complex includes reducing deferred maintenance, constructing replacement facilities, and disposing of surplus facilities. The Administration is committed to fully fund the construction of the Uranium Processing Facility (UPF) and the Chemistry and Metallurgy Research Replacement (CMRR), and to doing so in a manner that does not redirect funding from the core mission of managing the stockpile and sustaining the science, technology and engineering foundation. To this end, in addition to increased funding for CMRR and UPF, the FY 2012 budget will increase funding over the FY 2012 number in the 2011 FYNSP for facilities operations and maintenance by approximately $176 million.

Readiness in Technical Base and Facilities (RTBF): CMRR and UPF Construction – These two nuclear facilities are required to ensure the United States can maintain a safe, secure and effective arsenal over the long-term. The NPR concluded that the United States needed to build these facilities; the Administration remains committed to their construction.

Construction of large, one-of-a-kind facilities such as these presents significant challenges. Several reviews by the Government Accountability Office, as well as a "root-cause" analysis conducted by the Department of Energy in 2008, have found that initiating construction before designs are largely complete contributes to increased costs and schedule delays. In response to these reviews, and in order to assure the best value for the taxpayers, NNSA has concluded that reaching the 90% engineering design stage before establishing a project baseline for these facilities is critical to the successful pursuit of these capabilities.

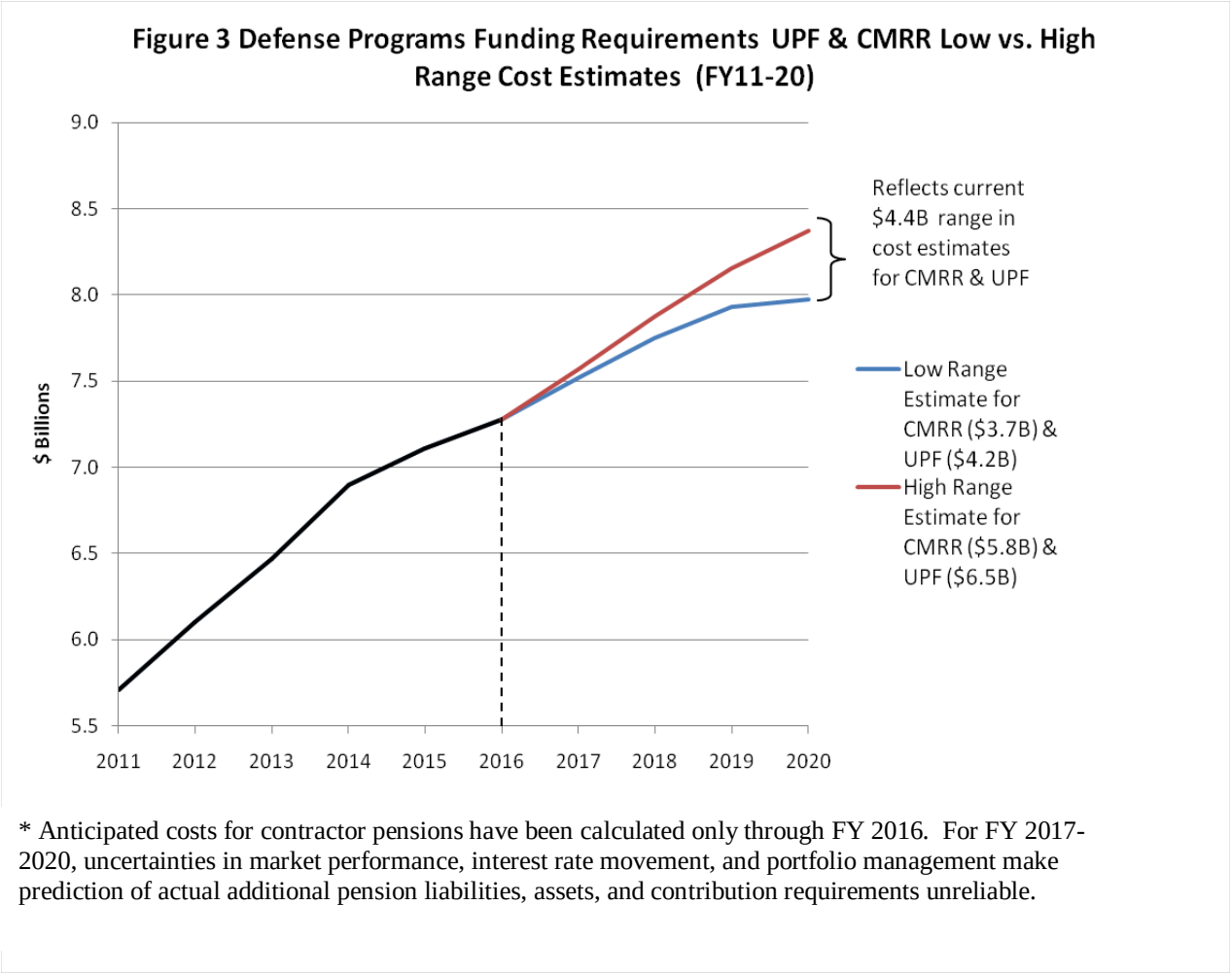
The ten-year funding plan reported in the *1251 Report* reflected cost estimates for these two facilities that were undertaken at a very early stage of design (about 10% complete), were preliminary, and could not therefore provide the basis for valid, longer-range cost estimates. The designs of these two facilities are now about 45% completed; the estimated costs of the facilities have escalated. Responsible stewardship of the taxpayer dollars required to fund these facilities requires close examination of requirements of all types and to understand their associated costs, so that NNSA and DoD can make informed decisions about these facilities. To this end, NNSA, in cooperation with the DoD, is carrying out a comprehensive review of the safety, security, environmental and programmatic requirements that drive the costs of these facilities. In parallel with, and in support of this effort, separate independent reviews are being conducted by the Corps of Engineers and the DOE Chief Financial Officer's Cost Analysis Office. In addition, the

Secretary of Energy is convening his own review, with support from an independent group of senior experts, to evaluate facility requirements.

The overriding focus of this work is to ensure that UPF and CMRR are built to achieve needed capabilities without incurring cost overruns or scheduling delays. We expect that construction project cost baselines for each project will be established in FY 2013 after 90% of the design work is completed. At the present time, the range for the Total Project Cost (TPC) for CMRR is $3.7 billion to $5.8 billion and the TPC range for UPF is $4.2 billion to $6.5 billion. TPC estimates include Project Engineering and Design, Construction, and Other Project Costs from inception through completion. Over the FYNSP period (FY 2012-2016) the Administration will increase funding by $340 million compared with the amount projected in the FY 2011 FYNSP for the two facilities.

At this early stage in the process of estimating costs, it would not be prudent to assume we know all of the annual funding requirements over the lives of the projects. Funding requirements will be reconsidered on an ongoing basis as the designs mature and as more information is known about costs. While innovative funding mechanisms, such as forward funding, may be useful in the future for providing funding stability to these projects, at this early design stage, well before we have a more complete understanding of costs, NNSA has determined that it would not yet be appropriate and possibly counterproductive to pursue such a mechanisms until we reach the 90% design point. As planning for these projects proceeds, NNSA and OMB will continue to review all appropriate options to achieve savings and efficiencies in the construction of these facilities.

The combined difference between the low and high estimates for the UPF and CMRR facilities ($4.4 billion) results in a range of costs beyond FY 2016 as shown in Figure 3. Note that for the high estimate, the facilities would reach completion in FY 2023 for CMRR and FY 2024 for UPF. For each facility, functionality would be attainable by FY 2020 even though completion of the total projects would take longer.



* Anticipated costs for contractor pensions have been calculated only through FY 2016. For FY 2017-2020, uncertainties in market performance, interest rate movement, and portfolio management make prediction of actual additional pension liabilities, assets, and contribution requirements unreliable.

Readiness in the Technical Base of Facilities (RTBF) - Operations and Maintenance
In order to implement an increased scope of work for stockpile activities, especially surveillance and the ongoing life extension programs (LEPs), the following will be supported:

- **NNSS –** Full experimental facility availability to support ongoing subcritical and other experiments necessary for certification of life extension technologies.
- **Pantex** – Funds are included in the FY 2012 request to fully cover anticipated needs for flood prevention.
- **SNL –** Replacement of aging and failing equipment at the Tonopah Test Range in Nevada to facilitate the increasing pace of operations support for the B61; and Micro-electronics, engineering test, and surveillance actions at SNL to support the B61, W76 and W78 that require additional equipment maintenance in facilities and the need to operate engineering test facilities that currently operate in a periodic campaign mode.
- **LLNL**, **LANL**, and **Y-12** – Investments in infrastructure and construction, including support for Site 300, PF-4, and Nuclear Facilities Risk Reduction.

- **Kansas City** – Investment sufficient to meet LEP needs for the W76-1, B-61, and W78/88 while preparing and completing the move to the KCRIMS site at Botts Road.
- **Savannah River** – Sufficient investment to ensure that availability of tritium supplies adequate for stockpile needs is assured.

RTBF: Other Construction – As the CMRR and UPF projects are completed, NNSA will continue to modernize and refurbish the balance of its physical infrastructure over the next ten years. The FY 2012 budget request includes $67 million for the High Explosive Pressing Facility project that is ongoing at Pantex, $35 million for the Nuclear Facilities Risk Reduction Project at Y-12, $25 million for the Test Capabilities Revitalization Project at Sandia, as well as $9.8 million for the Transuranic Waste Facility and $20 million for the TA-55 Reinvestment Project at LANL.

RTBF: Construction Management – Because of the unprecedented scale of construction that NNSA is initiating, both in the nuclear weapons complex and in non-proliferation activities, the Administration recognizes that stronger management structures and oversight processes will be needed to prevent cost growth and schedule slippage. NNSA will work with DoD, OMB, and other affected parties to analyze current processes and to consider options for enhancements.

C. Pension Cost Growth and Alternative Mitigation Strategies

NNSA has a large contractor workforce that is covered by defined-benefit pension plans for which the U.S. Government assumes liability. Portfolio management decisions, market downturns, interest rate decreases, and new statutory requirements have caused large increases in pension costs. The Administration is fully committed to keeping these programs solvent without harming the base programs. The Administration will therefore cover total pension reimbursements of $875 million for all of NNSA for FY 2012, adding $300 million more to the NNSA topline than the amount provided in FY 2011. Over the five year period FY 2012 to FY 2016, the Administration will provide a total of $1.5 billion above the FY 2011 level. About three-quarters of this funding is associated with Weapons Activities and is included in the funding totals for those programs noted above.

The Administration will conduct an independent study of these issues using the appropriate statutory and regulatory framework to inform longer-term decisions on pension reimbursements. The Administration is evaluating multiple approaches to determine the best path to cover pension plan contributions, while minimizing the impact to mission. Contractors are evaluating mitigation strategies, such as analyzing plan changes, identifying alternative funding strategies, and seeking increased participant contributions. Also, contractors have been directed to look into other human resource areas where savings can be achieved, in order to help fund pension plan contributions.

3. Summary of NNSA Stockpile and Infrastructure Costs

A summary of estimated costs specifically related to the Nuclear Weapons Stockpile, the supporting infrastructure, and critical science, technology and engineering is provided in Table 1.

Table 1 Ten Year Projections for Weapons Stockpile and Infrastructure Costs

	Fiscal Year										
$ Billions	**2010**	**2011**	**2012**	**2013**	**2014**	**2015**	**2016**	**2017**	**2018**	**2019**	**2020**
Directed Stockpile	1.5	1.9	2.0	2.1	2.3	2.5	2.6	2.6	2.6	2.6	2.6
Science Technology & Engineering Campaigns	1.6	1.7	1.8	1.8	1.8	1.8	1.9	2.0	2.1	2.2	2.3
Readiness in Technical Base and Facilities	1.8	1.8	2.1	2.3	2.5	2.5	2.5	2.7	2.8-2.9	2.9-3.1	2.9-3.3
UPF	*0.1*	*0.1*	*0.2*	*0.2*	*0.4*	*0.4*	*0.4*	*0.48-0.5*	*0.48-0.5*	*0.48-0.5*	*0.38-0.5*
CMRR	*0.1*	*0.2*	*0.3*	*0.3*	*0.4*	*0.4*	*0.4*	*0.48-0.5*	*0.4-0.5*	*0.3-0.5*	*0.2-0.5*
Secure Transportation	0.2	0.2	0.3	0.2	0.3	0.3	0.3	0.3	0.3	0.3	0.3
Defense Programs Subtotal	**5.2**	**5.7**	**6.1**	**6.5**	**6.9**	**7.1**	**7.3**	**7.5-7.6**	**7.7-7.9**	**7.9-8.2**	**8.0-8.4**
Other Weapons	1.2	1.3	1.3	1.3	1.3	1.3	1.4	1.4	1.4	1.4	1.5
Subtotal, Weapons	**6.4**	**7.0**	**7.4**	**7.8**	**8.2**	**8.5**	**8.7**	**8.9-9.0**	**9.2-9.3**	**9.4-9.6**	**9.4-9.8**
Contractor Pensions Cost Growth			0.2	0.2	0.2	0.2	0.2	* TBD	* TBD	* TBD	* TBD
Total, Weapons	**6.4**	**7.0**	**7.6**	**7.9**	**8.4**	**8.7**	**8.9**	**8.9-9.0**	**9.2-9.3**	**9.4-9.6**	**9.4-9.8**

Numbers may not add due to rounding

* Anticipated costs for contractor pensions have been calculated only through FY 2016. For FY 2017-2020, uncertainties in market performance, interest rate movement, and portfolio management make prediction of actual additional pension liabilities, assets, and contribution requirements unreliable.

4. Plans for Sustaining and Modernizing U.S. Strategic Delivery Systems

The Administration remains committed to the sustainment and modernization of U.S. strategic delivery systems, to ensure continuing deterrent capabilities in the face of evolving challenges and technological developments. DoD's estimates of costs to sustain and modernize strategic delivery systems will be updated as part of the President's FY 2012 budget request; until this budget request is finalized, figures provided in the May 2010 *1251 report* remain the best available cost estimates.

The following section of this report provides the latest information on DoD's efforts to modernize the Triad, including expected timelines for key decisions.

Strategic Submarines (SSBNs) and Submarine-Launched Ballistic Missiles (SLBMs)

As the *NPR* and the *1251 Report* note, the United States will maintain continuous at-sea deployments of SSBNs in the Atlantic and Pacific Oceans, as well as the ability to surge additional submarines in crisis. The current Ohio-class SSBNs, have had their service life extended by a decade and will commence retirement in FY 2027. DoD plans a transition between the retiring Ohio-class SSBNs and the Ohio-class replacement that creates no gap in the U.S. sea-based strategic deterrent capability.

Current key milestones for the SSBN replacement program include:

- Research, development, test, and evaluation (RDT&E) began in FY 2010 and continues with the goal of achieving 10 percent greater design maturity prior to starting procurement than the USS VIRGINIA class had before procurement started;
- In FY 2015, the Navy will begin the detailed design and advanced procurement of critical components;
- In FY 2019, the Navy will begin the seven-year construction period for the new SSBN lead ship;
- In FY 2026, the Navy will begin the three-year strategic certification period for the lead ship; and
- In FY 2029, the lead ship will commence active strategic at-sea service.

The Analysis of Alternatives (AoA) considered three platforms concepts for the Ohio-class Replacement: VIRGINIA-Insert, OHIO-Like, and a New Design. DoD is currently evaluating the advantages and disadvantages of each concept, including cost tradeoffs, with the goal of meeting military requirements at an affordable cost. An initial milestone decision is expected by the end of calendar year 2010 to inform the program and budget moving forward.

After the initial milestone design decision is made, DoD will be able to provide any adjustments to the estimated total costs for the Ohio-class replacement program. Thus, today's estimated total costs for FY 2011 through FY 2020 remain the same as reported in the *1251 Report*: a total of approximately $29.4 billion with $11.6 billion for R&D and $17.8 billion for design and procurement.

As noted in the *1251 Report*, the Navy plans to sustain the Trident II D5 missile, as carried on Ohio-class Fleet SSBNs as well as the next generation SSBN, through a least 2042 with a robust life-extension program.

Intercontinental Ballistic Missiles (ICBMs)

As stated in the Nuclear Posture Review, while a decision on an ICBM follow-on is not needed for several years, preparatory analysis is needed and is in fact now underway. This work will consider a range of deployment options, with the objective of defining a cost-effective approach for an ICBM follow-on that supports continued reductions in U.S. nuclear weapons while promoting stable deterrence. Key milestones include:

- The Capabilities-Based Assessment (CBA) for the ICBM follow-on system is underway.
- By late 2011, the study plan for the AoA, including the scope of options to be considered, will be completed.
- In 2012, the AoA will begin.
- In FY 2014, the AoA will be completed, and DoD will recommend a specific way-ahead for an ICBM follow-on to the President.

The Air Force is funding the ongoing CBA effort at approximately $26 million per year. Given the inherent uncertainties about missile configuration and basing prior to the completion of the AoA, DoD is unable to provide costs for its potential development and procurement at this time. However, DoD expects to be able to include funding for RDT&E for an ICBM follow-on system in the FY 2013 budget request, based on initial results from the AoA.

The Air Force plans to sustain the Minuteman III through 2030. That sustainment includes substantial ongoing life extension programs, cost data for which was provided to Congress in the May 2010 Section 1251 Report.

Heavy Bombers

DoD plans to sustain a heavy bomber leg of the strategic Triad for the indefinite future, and is committed to the modernization of the heavy bomber force. Thus, the question being addressed in DoD's ongoing long-range strike study is not whether to pursue a follow-on heavy bomber, but the appropriate type of bomber and the timelines for development, production, and deployment. The long-range strike study, which is also considering related investments in electronic attack, intelligence, surveillance and reconnaissance, air- and sea-delivered cruise missiles, and prompt global strike, will be completed in time to inform the President's budget submission for FY 2012.

As stated in the May 2010 1251 Report, pending the results of the long-range strike study, estimated costs for a follow-on bomber for FY 2011 through FY 2015 are $1.7 billion and estimated costs beyond FY 2015 are to-be-determined. DoD intends to provide any necessary updates to cost estimates along with the President's budget submission for FY 2012.

The Air Force plans to retain the B-52 in the inventory through at least 2035 to continue to meet both nuclear and conventional mission requirements. The Air Force will make planned upgrades and life extensions to the fleet. The B-2 fleet is being upgraded through three top priority acquisition programs: the Radar Modernization Program (RMP), Extremely High Frequency (EHF) Satellite Communications and Computers, and Defensive Management System (DMS), as well as multiple smaller sustainment initiatives.

Air Launched Cruise Missile (ALCM)

DoD intends to replace the current ALCM with the advanced long range standoff (LRSO) cruise missile. The CBA for the LRSO is underway. An AoA will be conducted from approximately spring 2011 through fall 2013. The AoA will define the platform requirements, provide cost-sensitive comparisons, validate threats, and establish measures of effectiveness, and assess candidate systems for eventual procurement and production.

The Air Force has programmed approximately $800 million for RDT&E over the FYDP for the development of LRSO. Based on current analysis of the program, the Air Force expects low rate initial production of LRSO to being in approximately 2025, while the current ALCM will be sustained through 2030. Until the planned AoA is completed, DoD will not have a basis for accurately estimating subsequent costs.