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Robust Nuclear Earth Penetrator Budget Request and Plan, FY2005-FY2009

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Summary

The FY2005 budget document for the National Nuclear Security Administration (NNSA) shows funding for the Robust Nuclear Earth Penetrator (RNEP) increasing sharply after FY2005 as the weapon proceeds beyond the study phase. NNSA states that these developments are shown for budgeting purposes and do not represent an actual plan. It further states that the out-year figures are already out of date, but that no new figures are available. A feasibility and cost study of RNEP currently under way was projected to cost $45 million between FY2003 and FY2005, but is now projected to cost $71 million between FY2003 and FY2006. This report explains the budget request and provides details on the plan. It will be updated as needed. CRS Report RL32130, *Nuclear Weapon Initiatives: Low-Yield R&D, Advanced Concepts, Earth Penetrators, Test Readiness*, by Jonathan Medalia, provides technical background and history.

Background

Nuclear earth penetrator weapons burrow into the ground some tens of feet before detonating, greatly increasing their ability to destroy hardened underground targets. RNEP is at present a study, begun in May 2003, of modifications to convert existing B61 or B83 nuclear bombs to an earth penetrator configuration. While the Air Force is leading the study, NNSA – a semiautonomous agency in the Department of Energy (DOE) responsible for nuclear warheads – is in charge of studying modifications of specific warheads.

RNEP is controversial. Supporters argue that it is needed to attack hard and deeply buried targets (such as leadership bunkers or WMD production facilities) in countries of concern, thereby deterring or defeating such nations; critics reply that RNEP would lower the threshold for use of nuclear weapons and prompt other nations to develop nuclear weapons to deter U.S. attack. Secretary of Defense Donald Rumsfeld said in May 2003

that RNEP "is a study. It is nothing more and nothing less."[1] The plan was that the RNEP study would cost $15 million a year for FY2003-FY2005. While Congress appropriated the FY2003 request of $15.0 million, the FY2004 request met much criticism. The House rejected an amendment by Representative Tauscher to transfer funds from RNEP to conventional means of attacking buried targets. The Senate tabled an amendment by Senator Dorgan and another by Senator Feinstein to bar funds for RNEP, and adopted an amendment by Senator Nelson (FL), and a similar amendment by Senator Reed, to require congressional authorization to start development engineering (discussed below) or later phases of RNEP. (The Nelson amendment became Section 3117 of P.L. 108-136, the FY2004 National Defense Authorization Act.) The appropriation was cut to $7.5 million.

In response to this reduction, NNSA plans to spend almost all of the $7.5 million to study the B83 as an RNEP candidate, and little on the B61 study. The B83 study is being conducted by Lawrence Livermore National Laboratory, in Livermore, CA, and Sandia National Laboratories' Livermore branch; the B61 study is the responsibility of Los Alamos National Laboratory, Los Alamos, NM, and Sandia National Laboratories' headquarters facility in Albuquerque, NM.

The RNEP Budget and Plan, and NNSA's Explanation

The FY2005 budget cycle is the first in which NNSA presented a detailed four-year projection along with the current request. For RNEP, the figures are: FY2005, $27.6 million; FY2006, $95.0 million; FY2007, $145.4 million; FY2008, $128.4 million; and FY2009, $88.4 million, for a five-year total of $484.7 million.[2] The FY2005 request also presented a plan for RNEP. By way of background, the Departments of Defense and Energy agreed years ago to a formal set of phases by which modified nuclear weapons move through research, development, production, deployment, and retirement, often called the Phase 6.X process. The key phases for RNEP are: Phase 6.2, feasibility study and option down select; Phase 6.2A, design definition and cost study; Phase 6.3, development engineering, in which the nuclear weapons laboratories produce a completed warhead design; and Phase 6.4, production engineering, in which the design is adapted for production and a system to manufacture the weapon is created. NNSA stated the performance targets for RNEP are as follows:

- FY2005: "Complete 56% of scheduled RNEP Phase 6.2/6.2A activity." Further, "In FY2005, subsystem tests and a full system test of the proposed design will be completed."

- FY2006: "Complete 100% of scheduled RNEP Phase 6.2/6.2A activity."

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[1] U.S. Department of Defense. "DoD News Briefing – Secretary Rumsfeld and Gen. Myers." May 20, 2003. At [http://www.defenselink.mil/transcripts/2003/tr20030520-secdef0207.html].

[2] U.S. Department of Energy. Office of Management, Budget, and Administration/CFO. *FY 2005 Congressional Budget Request.* volume 1, National Nuclear Security Administration. DOE/ME-0032, February 2004, p. 63. The RNEP budget is available under "Directed Stockpile Work" at [http://www.mbe.doe.gov/budget/05budget/index.htm].

- FY2007: "Report results of RNEP Phase 6.2/6.2A to Nuclear Weapons Council [a joint Department of Defense (DOD)-DOE agency that coordinates nuclear weapon programs] Obtain, if applicable, RNEP Phase 6.3 appropriate authorization. Complete initial 25% of scheduled RNEP Phase 6.3 activity (if authorized)."

- FY2008: "Complete 65% of RNEP Phase 6.3 activity (if appropriately authorized)."

- FY2009: "Complete 100% of scheduled RNEP Phase 6.3 activity (if authorized). Complete 15% of scheduled RNEP Phase 6.4 activity (if appropriately authorized)."[3]

The FY2005 request document therefore seems to cast serious doubt on assertions that RNEP is only a study. However, NNSA Administrator Linton Brooks stated:

> We included funds in our out-year budget projections to comply with legislative requirements for five-year budget projections. The out-year projections are placeholders in the event the President decides to proceed with development and Congress approves. No decision will be made until the study is completed. The law is clear that beginning 6.3 engineering development requires Congressional approval.[4]

An NNSA manager responsible for the program stated that, if out-year funds were not included in the FY2005 budget, NNSA would face two choices that it deems unsatisfactory: (1) By the time the budget for one fiscal year is submitted, the budget for the next fiscal year is largely fixed; without the placeholder, a decision to proceed with RNEP could not be implemented until the second fiscal year. (2) Alternatively, without the placeholder, a decision to proceed with RNEP could be implemented promptly only by taking the needed funds out of other programs. The budget projection reflects costs that might be expected if RNEP proceeds to Phases 6.3 and 6.4. The official emphasized that no decision has been made on whether or not to proceed with those phases pending completion of the Phase 6.2/6.2A study.[5]

The RNEP study was initially projected to cost $45 million – $15 million a year for FY2003-FY2005. The numbers, however, have changed for each year. For FY2003, delay in submission of a DOD study required by the FY2003 National Defense Authorization Act (P.L. 107-314, Sec. 3146) delayed the start of NNSA's RNEP study; as a result, $6.1 million was spent of the $15.0 million appropriated. For FY2004, Congress cut the RNEP appropriation to $7.5 million. For FY2005, the request is $27.6 million, vs. the $15.0 million originally planned. Finally, FY2006, not FY2005, will be the last year of the RNEP study; NNSA estimates the FY2006 request at $30 million. The four-year total is about $71 million.

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[3] Department of Energy, *FY 2005 Congressional Budget Request*, volume 1, p. 69, 70, 76.

[4] Letter from Linton F. Brooks, Administrator, NNSA, to Honorable Ellen O. Tauscher, March 17, 2004. Regarding the requirements for a 5-year budget projection, see National Defense Authorization Acts for FY1997 (P.L. 104-201, sec. 3155), FY2000 (P.L. 106-65, sec. 3253), and FY2001 (P.L. 106-398, sec. 3154 and 3155). The legislation requiring congressional approval to begin Phase 6.3 for RNEP is discussed in "Criticisms, Questions, and Responses," below.

[5] Telephone interview, February 10, 2004.

Owing to the uncertainties of the program, NNSA could not, as of early March 2004, project an RNEP budget for FY2007-FY2009. Indeed, a purpose of the 6.2/6.2A study is to provide a firm estimate of the cost of the project in Phase 6.3 and beyond. Thus no firm estimate is likely for some time. There is likely to be a schedule disconnect between submission of the FY2007 request, which in the normal course of the budget process would occur in early February 2006, and completion of the Phase 6.2/6.2A study, which will probably occur several months later, late in FY2006. It is unclear how NNSA would propose to handle a possible FY2007 request for 6.3 funds for RNEP.

According to NNSA, the study's cost has grown for several reasons. The $45 million did not take into account participation in the study by Y-12 Plant, which would make components of RNEP, or of Pantex Plant, which would convert existing weapons into RNEPs; their participation adds some $2 million. DOE has imposed additional project management requirements that add $2 million. The rest of the increase comes from a better definition of the requirements of the study, refinement of cost estimates, and an increase in surety (safety, security, and use control) of the proposed weapon. On the latter point, DOE requires that any modifications of a nuclear weapon includes looking for ways to increase its surety.[6] According to an NNSA source, "NNSA and the Air Force are committed to exploring ways to increase RNEP surety in a cost effective manner, consistent with DOE and military requirements."[7]

Criticisms, Questions, and Responses

Critics have reacted to the RNEP budget projection and plan. Representative Tauscher, in a letter to NNSA Administrator Linton Brooks, stated that "This is the first notice that we have received of a significantly ramped up activity," and that "the planning and budgeting for further steps in the 6.X process in the next five years speaks to a clear intent to develop these modified nuclear weapons at a time when the feasibility study has not been completed and the Department of Defense has not submitted a request for this weapon."[8] Steven Aftergood of the Federation of American Scientists argued that there are not five-year budgets for every research program that might lead to development. He reportedly said, "If they had placeholders for every funding scenario, they'd have to request an infinite amount of money .... This is an expression of intent to move ahead with an expanded program."[9] Another critic, Jay Coghlan, director of Nuclear Watch of New Mexico, was quoted as saying, "The present administration is definitely seeking to expand U.S. nuclear capabilities – while at the same time it denounces any kind of effort by others to do the same."[10]

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[6] U.S. Department of Energy. Order DOE O 452.1B, "Nuclear Explosive and Weapon Surety Program," approved August 6, 2001, Section 4(f).

[7] Information provided March 22, 2004.

[8] Letter from Representative Ellen Tauscher to Linton Brooks, Administrator, National Nuclear Security Administration, March 8, 2004, available at [http://www.house.gov/tauscher/03-08-04.htm].

[9] Paul Richter, "Questions Raised about Bomb Plan," *Los Angeles Times*, March 11, 2004: 12.

[10] Jeff Tollefson, Santa Fe New Mexican.com, March 11, 2004.

The following paragraphs present questions from Representative Tauscher's letter, responses from Administrator Brooks,[11] and additional information based on discussions with staff from NNSA, Los Alamos National Laboratory, and Lawrence Livermore National Laboratory. Representative Tauscher wrote:

> For FY 2005 the budget request describes the RNEP activities as including "subsystems tests and full system test of the proposed design." Such activities appear to go beyond research activities and may be interpreted to fall into 6.3 activities. In your view, why are such activities consistent with legislation passed by Congress last year? What specific activities would be associated with the initial year of 6.3 work on the RNEP in FY 2007?

Administrator Brooks responded:

> The "subsystem and full system tests of the proposed design" refer to impact tests to be performed on surrogate penetrator bodies at Sandia National Laboratories' sled track facility. These tests are consistent with the definition and requirements for a Phase 6.2 feasibility study. We need to understand whether the penetrator bodies are survivable to ground penetration in the required geologies before feasibility can be assessed.

To elaborate, the basis for this question is that the FY2004 National Defense Authorization Act, P.L. 108-136, section 3117, requires specific congressional authorization before starting Phase 6.3 or subsequent phases of RNEP. NNSA indicated that one type of physical test (as distinct from a computer simulation) is planned as part of the 6.2/6.2A study: a series of "sled track tests" at Sandia National Laboratories. Some would be done as full system tests, in which the various components of an RNEP would be assembled in a penetrator body (a strong, heavy, pointed metal case) without a guidance system or fissile materials.[12] This assembly would be mounted on a sled that is sent down a track at high speed and slammed into a large concrete block to test how well the components withstand the deceleration required of an earth penetrator weapon. This type of test is included in the 6.2/6.2A study because it is essential to assess feasibility. In turn, a successful demonstration of feasibility is a necessary condition for the weapon to proceed to Phase 6.3. In preparation for the full system tests, a number of subsystem sled tests will be conducted, in which candidate RNEP components are slammed into a water target. These tests are scheduled to start in the third quarter of FY2005, and will be held at Sandia's sled track, located at Kirtland Air Force Base in Albuquerque, NM.

More advanced tests would be conducted in Phase 6.3. In one type, "vibration flyaround tests," a mock-up of the weapon would be mounted on an aircraft and flown to validate that the weapon would not be damaged by the vibration of the aircraft and to determine the weapon's aerodynamic stability. In this test, the device would not be released. Another type of test, which would occur later in the development process once the guidance system is developed, would involve dropping a mock-up of the weapon from an aircraft. Both types of test would use surrogate material (a heavy metal) instead of

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[11] Letter from Linton F. Brooks, Administrator, NNSA, to Honorable Ellen O. Tauscher, March 17, 2004.

[12] Information provided March 11 and 12, 2004.

fissile materials. Other tests would probably be conducted as well, but it is too early in the process to say which tests would be conducted when.

Representative Tauscher also asked:

> With regard to the Annual Performance Results and Targets, what technical, military, and other criteria would the NNSA consider and what decisions would be made before it requests legislative authorization to begin 6.3 work? Who is involved in the determination to begin 6.3 work and why does the budget indicate that this might happen in FY 2007? Similarly, what criteria would the NNSA use to base its decision to go from phase 6.3 to 6.4 in FY 2009?

Administrator Brooks replied:

> The National Nuclear Security Administration (NNSA) does not make the decision to proceed to Phase 6.3 or subsequent phases. If NNSA and the Air Force agree that the Phase 6.2/6.2A study results support proceeding to Phase 6.3 engineering development, the Nuclear Weapons Council (NWC) could consider whether to proceed further. If the NWC recommends going forward, NNSA would move beyond the study stage only if the President approves and funds are authorized and appropriated by the Congress.

He further stated that the criteria NWC would use in this decision include "the feasibility and military utility of the design definition, and the projected cost and schedule established in the Phase 6.2/6.2A Study," and that "If RNEP does proceed to 6.3, the President and Congress will make a separate decision on whether to proceed to Phase 6.4, Production Engineering."

To support a decision to move RNEP to Phase 6.3, NNSA would address cost, schedule, and feasibility, while the Air Force would address military requirements. As a hypothetical example, NNSA might say that an RNEP would have a specified cost, could be ready by a certain date, and would have certain characteristics (weight, accuracy, depth of penetration, etc.) The Air Force might decide not to proceed if the penetration ability was too low or if a nonnuclear alternative existed, or it might recommend proceeding if the proposed RNEP was the only way to accomplish a critical military mission. The decision to request congressional approval would be worked through the Nuclear Weapons Council and ultimately be made by the President. These steps would occur before a request was submitted to Congress. The decision on whether or not to proceed with Phase 6.3 is projected to occur in FY2007 because the Phase 6.2/6.2A study is expected to conclude late in FY2006.