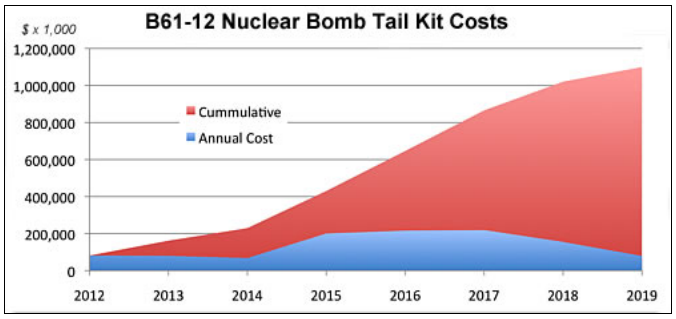
$1 Billion for a Nuclear Bomb Tail

Posted on Apr.12, 2013 in NATO (https://fas.org/category/nato/), Nuclear Weapons (https://fas.org/category/nuclear_weapons/), United States (https://fas.org/category/united_states/) by Hans M. Kristensen (https://fas.org/author/hkristensen/)

The U.S. Air Force plans to spend more than $1 billion on developing a guided tailkit to increase the accuracy of the B61 nuclear bomb.

The cost is detailed (to some extent) in the Air Force's budget request for FY2014 (http://www.saffm.hq.af.mil/shared/media/document/AFD-130408-066.pdf), which shows development and engineering through FY2014 and full-scaled production starting in FY2015.

The annual costs increase by nearly 200 percent from $67.9 million in FY2014 to more than $200 million in FY2015. The high cost level will be retained for three years until the project decreases after production ceases in FY2018. Some additional funding is needed after that to complete the integration and certification on (see graph).



Production of the guided tailkit is intended to match completion of the first new B61-12 bomb in 2019, a program that is estimated (http://blogs.fas.org/security/2012/07/b61-12gold/) to cost more than $10 billion. Although the number is a secret, it is thought (http://blogs.fas.org/security/2011/06/b61-12/) that the U.S. plans to produce roughly 400 B61-12s.

The expensive guided tailkit is needed, advocates claim, to make it possible to use the 50-kiloton nuclear explosive package from the tactical B61-4 bomb in the new B61-12 against targets that today require the 360-kiloton strategic B61-7 bomb. By increasing accuracy, the B61-12 becomes more useable (http://blogs.fas.org/security/2011/06/b61-12/) because it significantly reduces the amount of radioactive fallout created in an attack.

Once deployed in Europe, the B61-12 will also be able to hold at risk targets that the B61-3 and B61-4 bombs currently deployed (http://bos.sagepub.com/content/67/1/64.full.pdf+html) in Belgium, Germany, Italy, Netherlands, and Turkey cannot target.

The B61-12 program will maintain compatibility on all five current B61-capable aircraft (B-2A, B-52H, F-16, F-15E and PA 200). In 2015, integration, design and testing will begin on the new stealthy F-35A Joint Strike Fighter. The Air Force budget request shows (http://www.saffm.hq.af.mil/shared/media/document/AFD-130408-065.pdf) that B61-12 integration is scheduled for Block 4A and Block 4B aircraft in 2015-2021 with full operational capability in 2022 – three years after the first B61-12 is scheduled to be delivered (see table).

Author Info

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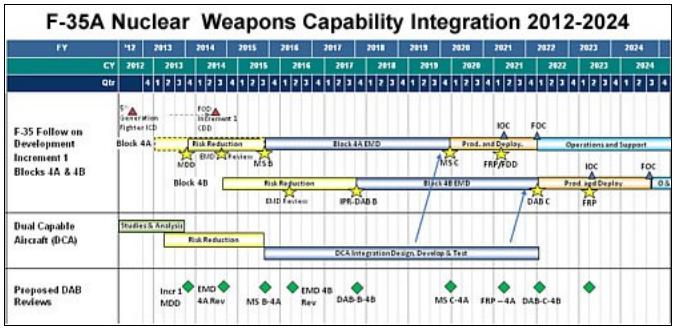

(/wp-content/uploads/sites/4/f35-b61.jpg)

The combination of the new and more accurate guided B61-12 on the stealthy F-35A will significantly increase the capability (http://blogs.fas.org/security/2011/06/b61-12/) of the U.S. non-strategic nuclear posture in Europe. This development is out of tune with U.S. and NATO pledges to reduce the role and reliance on nuclear weapons, and will make it a lot easier for hardliners in the Russian military to reject reductions of Russia's larger inventory of non-strategic nuclear weapons.

This publication was made possible by a grant from the Ploughshares Fund. The statements made and views expressed are solely the responsibility of the author.

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5 thoughts on "$1 Billion for a Nuclear Bomb Tail"

1. **Frank Shuler** says:
   April 13, 2013 at 4:11 pm (https://fas.org/blogs/security/2013/04/b61-12tail/#comment-8571)
   Based on your 2012 data, do we still believe the current American inventory of B61s, versions 3, 4 and 7, to be approximately 920?

   Frank Shuler

   USA

   Reply (/blogs/security/2013/04/b61-12tail/?replytocom=8571#respond)
   1. **Hans M. Kristensen** says:
      April 16, 2013 at 3:31 pm (https://fas.org/blogs/security/2013/04/b61-12tail/#comment-8574)
      If including the B61-10, yes. But most of the weapons are in the inactive stockpile.

      Reply (/blogs/security/2013/04/b61-12tail/?replytocom=8574#respond)
2. **Raoul D. Revord, J.D., Ph.D** says:
   April 15, 2013 at 3:29 am (https://fas.org/blogs/security/2013/04/b61-12tail/#comment-8572)
   While I believe that improving accuracy of the bomb is a good thing, I would rather see research and development of a technical means of preventing a first-strike by any nation having offensive nuclear missiles, while the human species awaits a world free of nuclear weapons.

   Reply (/blogs/security/2013/04/b61-12tail/?replytocom=8572#respond)
3. **Keith** says:
   April 15, 2013 at 1:13 pm (https://fas.org/blogs/security/2013/04/b61-12tail/#comment-8573)
   Question: You said "By increasing accuracy, the B61-12 becomes more useable because it significantly reduces the amount of radioactive fallout created in an attack."

   How does increasing accuracy reduce fallout? Isn't fallout a function of the radioactive material inside the bomb combining with the dirt and debris from the explosion? I don't see how improved accuracy would affect this unless the yield is reduced by reducing the amount of radioactive material. As I understand it simply "dialing" down the yield will not really impact the amount of fallout since you still have the same amount of radioactive material present at the time of detonation. Lowering the yield reduces the spread of the fallout, but it is all still there.

   Reply (/blogs/security/2013/04/b61-12tail/?replytocom=8573#respond)
   1. **Hans M. Kristensen** says:
      April 16, 2013 at 5:18 pm (https://fas.org/blogs/security/2013/04/b61-12tail/#comment-8575)
      Correct, the material in the weapon will always be there. Apart from the amount of fissile material in the weapon, the fallout is mainly determined by how much dirt and debris the blast ejects into the atmosphere. That is determined by two variables: the explosive yield and the hight at which the detonation occurs (Hight of Burst, HOB). For an air-burst where the fireball doesn't interact with the surface, there would be very little local radioactive

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fallout. The optimum HOB is the height over the surface where, for a given yield, the peak pressure over the target is a maximum with little or no fallout. If the HOB causes the fireball to interact with the ground, certainly if it is a ground-burst, large amounts of dirt and debris will be ejected into the atmosphere, irradiated, and fall back to the ground. This is where increasing the accuracy of a weapon becomes important because it allows employment against harder targets closer to the ground with lower yield and reduced fallout as a result. Here is how we formulated the B61-12 improved capability against underground targets in a study (http://blogs.fas.org/security/2011/06/b61-12/) we did in 2011:

> Shock damage to underground structures is related to the apparent (visible) radius of the crater caused by the nuclear explosion. For example, according to the authoritative The Effects of Nuclear Weapons published by the Department of Defense and Department of Energy in 1977, severe damage to "Relatively small, heavy, well-designed, underground structures" is achieved by the target falling within 1.25 apparent crater radii from the Surface Zero (the point of detonation), and light damage is achieved by the target falling within 2.5 apparent crater radii from the Surface Zero. For a yield of 50 kt – the estimated maximum yield of the B61-12, the apparent crater radii vary from 30 meters to 68 meters depending on the ground (see graph below). Therefore an improvement in accuracy from 100-plus meter CEP (the current estimated accuracy of the B61) down to 30-plus meter CEP (assuming INS guidance) improves the kill probability against these targets significantly by achieving a greater likelihood of cratering the target during a bombing run. Put simply, the increased accuracy essentially puts the CEP inside the crater.

Reply (/blogs/security/2013/04/b61-12tail/?replytocom=8575#respond)

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