John Ainslie

To: info@gzcentre.org
Subject: Trident changes

Thanks for the latest copy of Ground zero which we have received through the post.

I am trying to piece together the few things which are known about the possiblities of using Trident in a low-yield / conventional / bunker-busting role.

There was a study done by Lockheed Martin which I have ordered from www.stormingmedia.us:

A Hard and Deeply Buried Target Defeat Concept 1996
Authors: Swinford, Nancy F.; Kudlick, Dean A.; LOCKHEED MARTIN MISSILES AND SPACE CO SUNNYVALE CA
Abstract: A Mission Need Statement (MNS) written by the United States Strategic Command and the Air Force's Air Combat Command has generated the current study of a Hard and Deeply Buried Target Defeat Capability, which combines target construction and purpose with weapon technologies and capabilities to determine cost effective solutions for hardened target defeat. A promising solution consists of a conventional Submarine Launched Ballistic Missile (SLBM) that delivers a modified, existing reentry body (RB) aeroshell encasing a unitary penetrator. The accuracy is controlled by a tightly coupled Global Positioning Satellite receiver and Inertial Measurement Unit (GPS/IMU) system. This paper examines the benefits and challenges of the SLBM-delivered RB. The selected control system is discussed relative to the performance requirements imposed by the aeroshell size and packaging constraints. One of the major challenges for an SLBM system is slowing down to meet the penetrator constraints. Current RB aerodynamic performance capabilities, trajectory shaping required to meet the penetrator impact conditions, and the control system concept are reviewed. Finally, future areas to be investigated are discussed.

There are two current US research projects:

There is an Enhanced Effectiveness (E2) is a program to substantially increase the accuracy of the W76 Trident warhead. In January 2003 Lockheed Martin lodged a patent for a Re-entry Vehicle (RV) extension as part of E2. This has flaps that so the RV can be manoeuvred in flight around three axes. It was tested during a Trident missile launch in October 2002. The flaps will be incorporated in an extension will make the W76 substantially larger - the same size as the W88. Several years ago the Navy tested whether a GPS receiver could be used on an RV in flight. The new project will include a receiver and is intended to give the RV "GPS accuracy". The FY2004 budget includes funding of E2 development but not production.

E2 also includes developing selectable yields for Trident warheads. Paul Robinson of Sandia has indicated that US Trident missiles could be armed with a single lower yield warhead with a dummy secondary. This would probably be similar to the British sub-strategic Trident warhead. The US might also go beyond this and develop a range of yield options for W76. Mr Robinson has said that these warheads could be used for "non-Russia" roles, including targeting non-nuclear states.

US plans for a Robust Nuclear Earth Penetrator (RNEP) are currently focused on the Air Force B61 and B83 bombs. However the Department of Energy budget for FY2004 indicates that the Navy has asked for a W76 feasibility and cost study "associated" with the RNEP. Given that a contact fuse is being designed for W76-1 and that Lockheed has patented a Manoueverable Re-entry Vehicle for Trident, the Navy may be arguing that Trident can fulfil the role of RNEP - destroying deep command bunkers. There remain major technical problems - chiefly the high velocity of the incoming RV. Lockheed appear to be considering flaps, not just to manouvre the RV, but also to slow it down.

The situation in the UK is not clear. Comments about the yield of "sub-strategic" Trident have been deliberately confusing. Under questioning from MPs in 1994 the MoD indicated that the existing missile and warhead could be used in a sub-strategic role. The only money which was spent was on modifying the shore-based target planning system. Some later comments have vaguely suggested that "sub-strategic" Trident may have a lower yield. I now think that this is unlikely.

I understand that variable-yield weapons modify the yield by changing the voltage in the neutron generator. The neutron generator in UK Trident warheads is bought off-the-

shelf from the US. A modified neutron generator has just entered service with both UK and US Trident. An even newer one has been designed for W76-1, due to enter service in 2007. There are a number of references to these on the internet, none refer to variable yield, and I suspect that both these new neutron generator designs are for fixed yield.

I haven't yet seen the FY2005 R&D budget paperwork but this may add more. Do you have any more information on this, or any comments ? Or is there anyone else who knows more about this ?

By the way, we are organising a march and rally at Faslane on Easter Monday, 12 April, preceded by a walk from Glasgow. More details on our website www.banthebomb.org

Best wishes,

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