

THE UK TRIDENT MISSILE SYSTEM FACTSHEET

The UK Trident Missile Operational System uses four Vanguard-class submarines. Three separate components make up the Trident system; thermonuclear weapon warheads, missiles and submarines.

At any one time, three of the submarines are armed with Trident II D-5 ballistic missiles able to deliver thermonuclear warheads from multiple re-entry vehicles. Operated by the Royal Navy and based at Clyde Naval base on Scotland's west coast, at least one submarine is always on patrol to provide a continuous at-sea deterrent. Under the terms of the 2010 Strategic Defence and Security Review (1), in the near future the three-armed submarines will each carry a maximum of 8 missiles and 40 warheads. The fourth submarine and its ordinance are kept in the UK where it receives the necessary servicing and maintenance needed to sustain operational efficiency.

The Warheads

The British government states that the warheads used in the UK Trident system were designed and manufactured in the UK at the Atomic Weapons establishment (AWE) at Aldermaston. The government has admitted that three components of the warhead (the neutron generator, gas transfer system and arming fusing and firing systems) are purchased from the United States (2). The fourth component, the thermonuclear bomb, is manufactured at the AWE facilities near Aldermaston and Burghfield on a design modified from an American-based original. The completed warheads are assembled at AWE and transported to storage facilities in Scotland by heavily guarded overland convoys (3). The number of nuclear weapons in the overall stockpile is anticipated to fall to less than 180 in the 2020s(1).

Trident II D-5 Missiles (UGM-133)

The Trident II D-5 ballistic missiles are submarine-launched and built by Lockheed Martin Space Systems, California. They are deployed by the US Navy and the Royal Navy (4): those deployed by the RN are leased from America. Each missile has a range of 11,300 kilometres (7000 miles): they use inertial and stellar guidance systems and are not dependent on GPS. They require gravity and weather data from the US for some elements of their guidance systems. After reaching their apogee, most of the missiles will release multiple independently targeted warheads, so that one missile can achieve a greater amount of destruction than if it had only one warhead. However one missile may be armed with only one warhead.

Submarines

All four UK submarines were built to an American design at Barrow-in-Furness, and are designated 'Vanguard Class'. Each submarine was originally built with 16 missile silos but

according to the 2010 Strategic Defence and Security review, the number of operational silos will fall to eight.

Operation of the UK Trident System

The UK Trident System is made up of 58 leased Trident II D-5 missiles, 4 native Vanguard-class ballistic missile submarines and approximately 160 operational thermonuclear warheads, together with command and control and other supporting infrastructure. The 2010 Strategic Defence and Security review stated that in future each armed submarine would carry a maximum of 40 warheads distributed unevenly among its eight missiles (1). Most of the warheads have a yield of 80-100 kilotons-equivalent of TNT; but a small number have lower yields (5). (The bomb on Hiroshima had a yield of 16 kilotons)

Patrols

The principle of operation is known as continuous-at-sea-deterrence (CASD) in which at least one submarine is always on active patrol. Two are in port at Faslane or on training exercises while the fourth submarine is generally undergoing a long refit in Devonport Naval Base. During a patrol, a submarine is required to remain silent for 3 months. A 1000 metre aerial trails on the surface behind the submarine to pick up incoming messages. Intelligence is constantly relayed to the vessel.

Basing

Trident is based at HMNB Clyde in western Scotland. This comprises 2 facilities, a submarine base at Faslane on Loch Long and an ordnance depot at RNAD Coulport. Coulport is used to store warheads and provides loading and unloading facilities. Repair, refuelling and refit of the Vanguard class submarines is carried out at Devonport.

Command and Control

The prime minister or a designated survivor can authorise the Chief of Defence Staff to order the missiles to be fired. The message is sent by CTF 345 (6) operations room at Northwood, which communicates with the Vanguard commander on patrol. Two personnel are required to authenticate each stage of the process before launching, with the submarine commander only able to activate the firing trigger after two safes have been opened with keys held by the ship's executive and weapons engineering officers. If the command and control system in the UK has been destroyed in a nuclear attack, the submarine commander opens a sealed letter from the prime minister that contains instructions on what he should do. (7)

References

- 1) Securing Britain in an Age of Uncertainty. the Strategic Defence and Security Review 2010
- 2) The UK has purchased three W76 components- the Arming , Fuzing and Firing System, Gas Transfer System and Neutron Generator - US Hansard 4 December 2009
- 3) Edward Robert Nov 12 2005 New Scientist. If a Nuclear Convoy Should Crash .
- 4) Lockheed Martin Trident Missile D5 Missile Archives 130th consecutive successful flight. Lockheed December 28 2001
- 5) White Paper on Trident Replacement in December 2006 referred to " The continuing availability of a lower yield from our war head" The Future of the United Kingdom's Nuclear Deterrent, December 2006, Cm 6994 para 4-9
- 6) <http://www.dailymail.co.uk/home/moslive/article-2202784/Britains-secret-nuclear-bunker-Buried-100ft-inside-control-room-order-launch-strike-given.html>
- 7) http://news.bbc.co.uk/1/shared/spl/hi/pop_ups/08/programmes_chain_of_command/html/1.stm