



The History of the UK's Nuclear Weapons Programme

Start of the UK's nuclear weapons programme

- The United Kingdom's nuclear weapons programme had its origins in the Second World War. In 1941, the then Prime Minister, Winston Churchill, authorised the development of an atomic bomb following a report that showed it was scientifically feasible. UK work on developing a nuclear weapon progressed only slowly, leading in 1943 to an agreement between Churchill and US President Roosevelt that the British work should be subsumed into a larger joint effort – the Manhattan Project.
- Wartime UK-US nuclear collaboration was brought to an end by the 1946 US Energy Act (the McMahon Act), following which, in 1947, the Attlee Government decided to resume an independent UK programme to develop an atomic weapon. The UK successfully tested its first atomic bomb in October 1952.

Thermonuclear era and the UK-US Mutual Defence Agreement

- In 1952, the Americans successfully tested a thermonuclear weapon ("H-bomb"), which was much more powerful than the earlier atomic weapons. The Soviet Union followed suit in 1954. Consequently, in the same year, the Cabinet committed the UK to developing a thermonuclear weapon. The UK's first successful detonations of such

weapons occurred during the Grapple series of trials at Malden and Christmas Islands in the Pacific Ocean during 1957 and 1958.

- In 1958, after modification of the 1946 McMahon Act, bilateral UK-US nuclear collaboration was resumed and the Agreement for the Co-operation on Uses of Atomic Energy for Mutual Defence Purposes ("Mutual Defence Agreement" or MDA) was signed. The MDA became, and remains, the cornerstone of UK-US co-operation on nuclear defence issues. It was renewed in 2004 for a further period of ten years.

Air-launched nuclear weapons

- Britain's first operational nuclear weapon was the Blue Danube free-fall bomb, which was carried by the V-bombers (Valiant, Victor and Vulcan) of the RAF's strategic bomber force from 1956.
- A succession of air-launched nuclear weapons was developed during the late 1950s and early 1960s. Yellow Sun Mk.2 was the UK's first operational thermonuclear weapon and was in service from 1961 to 1969. Blue Steel was the UK's first nuclear missile (operational from 1962 to 1969), launched from a V-bomber. However, Blue Steel had operational constraints and its further development was cancelled in 1961 in favour of participating in the US's Skybolt programme to develop an air-launched stand-off missile.
- The last of the UK's air-launched nuclear weapons was the WE177 free-fall bomb, which entered service in 1966 and was finally withdrawn in 1998.

The path to Polaris

- In the mid-1950s, largely as a result of concerns about the vulnerability of the V-bombers to Soviet air defences, the UK commenced development of the Blue Streak ground-launched, intermediate range ballistic missile. However, in 1960 this programme was cancelled, mainly because of concerns at the potential vulnerability of a silo-based missile system to a pre-emptive strike.
- In 1962, the Kennedy administration cancelled the Skybolt programme, which the UK had joined in 1961, due to cost overruns and delays to the planned in-service date. The UK was therefore left with a nuclear deterrent of diminishing credibility based on the V-bomber force, and with no replacement under development.
- This situation was resolved when Prime Minister MacMillan and President Kennedy concluded the Nassau Agreement in 1962, in which the US undertook to make the Polaris missile system available to the UK. The agreement was formalised in 1963 with signature of the Polaris Sales Agreement.

Submarine-based deterrent

- The Polaris submarine-launched ballistic missile system entered service with the Royal Navy in 1968 and the V-bombers were withdrawn from the nuclear role in 1969. 16 Polaris missiles were carried by each of four Resolution-class nuclear-powered submarines, which were designed and built in the UK. The warheads were also designed and built in the UK and initially comprised a modified version of the WE177 device. This was replaced in 1982 by the Chevaline warhead, which was designed to address concerns about the increasing vulnerability of the Polaris system.
- In 1980, the Government announced its decision to procure the Trident C4 missile system to replace the ageing Polaris system, and then in 1982 to procure instead the D5 variant of the Trident missile because of its increased capabilities and the long-term financial savings resulting from operating the same missile as the US Navy. From 1994 onwards, four UK-designed and built Vanguard-class submarines carrying the Trident missiles progressively replaced the Resolution-class submarines. The Polaris era ended at a ceremony on 28 August 1996 at Faslane to mark the decommissioning of the last Resolution-class submarine, REPULSE.