

## John Ainslie

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**From:** BRIAN BURNELL [brian.burnell@btinternet.com]  
**Sent:** 27 March 2008 13:27  
**To:** John Ainslie  
**Subject:** anglicization

Hi John

I haven't seen the items you refer to, seemingly claiming that the Polaris warheads were 'anglicised copies of US warheads. If, that is, I've understood you correctly, and I'm not certain I have. But I can say with certainty that the first UK Polaris warhead is well documented in the archives. There was a fair amount of discussion in Whitehall about it.

The initial choice was a copy of the US W-47 used in the US A1 and A2 missiles. AWRE advised against that choice because:

a) it used horrendous quantities of fismat, that the Brits didn't have and couldn't afford.

b) Secondly, AWRE advised that the W-47 was unstable, dangerous, likely to be prone to mechanical faults in its safing and arming system. That was before the Americans had experienced its many faults as documented in Hansen's SWORDS, so it was remarkably astute of AWRE to identify these likely faults in advance. The decision went to ministerial level where the decision to reject the W-47 was made. The W-47 was referred to by the UK codename STEVEN.

There were various other US warheads evaluated, and at one time, after a decision to purchase the later A3T missile, a triple warhead load became necessary and a 'Chinese copy' of the W-58 became the favoured choice. That was objected to by the Ordnance Board, responsible for safety standards. They objected to the use of PBX-9404, a plastic-bonded HE with a high shock-sensitivity, that failed to meet the more stringent UK standards for explosive safety. Efforts were made to replace the PBX-9404 with a UK-specific HE, but this would degrade the trigger's fission yield too much to ensure ignition of the fusion secondary after several years in storage with the warhead's tritium slowly degrading. Some Whitehall papers pointed out that while UK Polaris at the Gareloch used a 'safer' HE, a few miles downstream at the Holy Loch the USN Polaris and Poseidon warheads used PBX-9404 deemed 'unsafe'. LOL. Unloading and re-supply at base is the most likely time for an accidental rough-handling mishap, and when HE is at greatest risk.

The next and final choice of fission trigger was a UK design evolved from the Cleo and Super-Octopus design tested at UGT PAMPAS. This was originally intended as a trigger for the Skybolt warhead and the then-projected tactical weapon that became WE.177A. The rationale was that there were economic advantages in a 'family' of warheads all stemming from one basic design.

In WE.177A this warhead was known as KATIE A.

Used in WE.177B it was known as KATIE.

In Polaris A3T it was known as JENNIE.

Unfortunately for the Brits, it later proved to be vulnerable to Soviet ABMs before re-entry, and that vulnerability was the rationale behind the Chevaline upgrade, which reverted to the original choice of a 'Chinese copy' of the US W-58 trigger known by the UK codename HARRIET, matched with the recycled REGGIE secondary derived from the W-59. Rather akin to Woolworth's 'Pick-n-Mix'. The problem with the W-58's shock-sensitive PBX-9404 was resolved by the Ordnance Board, but as yet we do not know how. HARRIET was tested at UGTs FALLON and BANON at NTS.

The Skybolt warhead choice included a fusion secondary that was a cut-down version of the US W-59 used in some Minuteman ICBM's.

It was known in the UK as RE.179 (for Skybolt and Blue Water).

Known as SIMON when adapted in a 450 KT version for WE.177B.

The same W-59 secondary was used in a cut-down version known as REGGIE in the Polaris A3T warhead, and re-cycled into the new warhead for Chevaline. Some were surplus (Chevaline used only two-thirds) and these were recycled into WE.177C with the same 200 KT yield as in Polaris A3T.

This W-59 fusion secondary was a UK 'Chinese copy' in all these weapons. Only the trigger in Polaris A3T was not of US design.

The W-59 was a Los Alamos design for the USAF, and was never used or favoured by the USN, whose preferred design lab was Livermore, which produced the W-47 and W-58 for the USN Polaris fleet, and the W-68 for Poseidon. A difficulty for the Brits was that the W-59 also was retired very early, making spares procurement difficult. The USAF preferred the Minuteman version with the W-56 warhead (ironically, based on Livermore's W-47) and these made up the bulk of the Minuteman force, not replaced until 1993.

A feature of the Chevaline internal discussions was the lack of commonality between the RN and the USN that made spares procurement a logistical nightmare. Chevaline exacerbated that nightmare, and the Naval Staff were not pleased. They never wanted Chevaline. Their preference was for Poseidon. The arrangements made for common supply and servicing with first Trident C4 and later D5 were almost certainly an outcome of the W-47-W-50-W-58-W-59-Cleo-Katie-Chevaline debacle.

The hard evidence in support of this is cast iron. Bit lengthy this. Hope its helpful. Brian.