

## US ROLE IN WARHEAD PRODUCTION

Formal warhead programme has 4 major elements:

1 development & 2 production - covers nuclear tests, purchase of elements of RV, certain warhead related components in RV - elements 1&2 are mainly incurred in US  
3 special (fissile) materials: the major item of the warhead procurement costs, mostly incurred in UK

4 attributable capital: all incurred in UK (AWE?)  
(HC 422 87/8 p22)

A decision was made to procure certain materials within the warhead/misc/contingency heading in the UK and not in the US. This resulted in a saving of  $\text{£}269\text{m}$  from spending in US and addition of  $\text{£}625\text{m}$  to UK spend.

"Most of the expenditure on development and production (of the UK trident warhead) is incurred in the US"

(MOD/PSA control & management of Trident Programme, UK National Audit Office, HMSO, 1 July 87)

UK has no plant to produce Lithium 6 (lithium Deuteride). Without this it is not possible to produce a H bomb but only a improved A bomb. (UAC D Campbell)  
American warheads use a special Insensitive High Explosive and this may be used on Chevaline [and Trident].

(Nuke Watch Information Pack)

Contracts for warhead related elements not listed, eg with US Dept of Energy and Defence Nuclear Agency Field Command. (ADIU 10/3 May/Jun 88)

Spending in US on warhead parts, sub fuel and nuclear testing in Nevada will cost  $\text{£}1$  billion. (Ind 260188)

Delivery of US warhead related RV body components had begun by Jan 88 (HC 422 87/8 p22)

Savings appear to have been found in US spend in 87  
(HC 422 87/8 pxix)

### US relations with AWE

"we have close links with the American nuclear programme and they give us a considerable amount of help .. very helpful .. in providing so much information" ..

Director of Los Alamos said that what US get out of the relationship is:

1) There are some areas of nuclear weapons expertise which are held at Aldermaston where we have no equal .. they rely on us .. in these areas which are a small part of the programme

2) AWE provides someone with whom US can talk to and bounce off ideas.

French do 5 times as many tests for similar result as UK, because of help which US gives UK. If UK were doing research on our own it would cost a lot more.

AWE scientists are very highly thought of in the US.

US draws from UK expertise and vice versa, ratio 10:1 in UKs favour

(HC 415 90/91 p 2, 5, P Levene, Chief of Defence Procurement MOD) see DESIGN.WHD & SPECMAT.WHD

## WARHEAD DESIGN

Warhead design was frozen in 1987 (HC 374 88)

Warheads which were developed for C4 will be developed for D5  
(HC 479 84/5 para 25)

Development of warhead well advanced by 81/2 and same warhead will be used on  
D5 as planned for C4 (HC 266 81/2 q4)

Most of manufacture of warheads will be in UK to a design originating in UK.

Number of warheads to be produced is classified.

.....X..... Weight

....XXX....

....XXX.... Fusion component

...XXXXX...

...XXXXX...

..XXXXXXXX.. Control devices

..XXXXXXXX..

.XXXXXXXXXXXX. Fission component

.XXXXXXXXXXXX.

..... Connectors

Fusion component includes depleted uranium (worked at Cardiff), Tritium  
(chapelcross) and Lithium-6 Deuteride.

Control device includes timer and altimeter for height of burst.

Fission component contains Plutonium core (reprocessed at Sellafield & worked at  
Aldermaston) then fissile uranium (enriched at Capenhurst and in US) then depleted  
uranium tamper (worked at Cardiff) then Beryllium deflector (produced at Cardiff), all  
surrounded by high explosive detonators. (Independent 26 Jan 88 - with drawing)

W76/Mk4 (US)

used on Trident 1 & 2 each with approx 100Kt. W76 first produced in 1978, US has  
3200. CEP .23 - .5 Km. Can attack moderately hard targets (bomber bases, heavy  
industry), not hard targets. D5 missile can carry 10/12 W76

Lower yield than W88 (HC 286, 90/91, p7)

W88/Mk5 (for US Trident 2)

W88 is under development, 475Kt. D5 missile can carry 8 W88. Each missile could  
only carry one type. For START each will be counted as 8. CEP .13 - .19 Km.

W88 suitable for hard targets. (Neptune 2)

"We do not have detailed design information from the US on the W88 warhead. I do  
not know what explosives they use " (Mr Seed)

Production halted by closure of Rocky Flats plant which may open 91.

(HC 286, 90/91, p7)

## Nuclear Tests

Costs of tests in Nevada are part of payment by UK to US for Trident. (HC 422 May 88)

Test of UK 20 KT warhead in Mid 83, possibly for Trident. (Janes WS 85)

11 tests since 1980, bulk of which for Trident, borne on Class 1 Vote 2 of Supplies Estimates. There have been no tests since Jul 87 (HC 374 88)

List of all UK tests in US 76-87: (C&AG 87 para 3.27 & SIPRI)  
(HC 237 90 p61)

mb

1976	26 Aug	5.5	est 64 kt
1978	11 Apr	5.6	
	18 Nov	5.6	
1979	29 Aug	5.2	
1980	26 Apr	5.8	
	24 Oct		
	17 Dec	5.3	
1981	12 Nov	5.6	
1982	25 Apr	5.6	
1983	22 Apr		est 20 kt
1984	1 May	5.7	
	9 Dec	5.6	
1985	5 Dec		
1986	25 Jun	5.5	
1987	17 Jul		
1989	8 Dec		
1990	14 Nov		
1991	Nov		

US describes tests as 20 - 150 kt

Estimates in SIPRI for 1976 indicate for US tests:

5.1 = 26 kt 5.7 = 100 kt 5.8 = 110 kt 5.9 = 150 kt

Large degree of error due to difficulty of assessing geological and other factors.

There is a test agreement not to exceed 150 kt.

41 UK tests up to Dec 87, 15 of which 76-87 (SIPRI)

One nuclear test since Jan 90 on 14 Nov 90

(HC 286, 90/91, p24)

RFA Regent visited Kings Bay with a restricted cargo on  
24 Sep 91. [possibly delivering warhead for test]

9. The fact of boosting, the fact that deuterium and tritium are used as boosting fuels in HEA weapons and that they are contained in components known as reservoirs or cartridges which are shipped between the Savannah River Plant and the AEC weapon facilities, the military and the United Kingdom. (72-11) (See also II.A.8. and V.C.2.o.)

a. Fact that gaseous deuterium (D) and tritium (T) are used as boosting fuel. (83-2) (See also II.A.8.a. and V.C.2.o.(3))

\*\*15. As part of the 1958 United States - United Kingdom Mutual Defense Agreement, there have been three barter agreements. The United States received plutonium totaling 5,366 kilograms from the United Kingdom under the Barter A, B, and C Agreements during the period 1960 - 1979. The United States gave the United Kingdom 6.7 kilograms of tritium and 7,500 kilograms of highly enriched uranium for the plutonium. (94-15) (See also II.G.36. and II.M.44)

\*\*16. The amount of tritium in a reservoir is typically less than 20 gm. (95-5)

- Drawing back the curtain of secrecy. US DEO NW declassification re Tritium