HOUSE OF COMMONS SESSION 1994–95

CONFIDENTIAL—FINAL REVISE

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DEFENCE COMMITTEE

Eighth Report

PROGRESS OF THE TRIDENT PROGRAMME

Report, together with
the Proceedings of the Committee relating to the Report,
Minutes of Evidence and Memoranda

The Defence Committee is appointed under Standing Order No 130 to examine the expenditure, administration and policy of the Ministry of Defence and associated public bodies.

The Committee consists of 11 Members, of whom the quorum is three. Unless the House otherwise orders, all Members nominated to the Committee continue to be members of it for the remainder of the Parliament.

The Committee has power:

(a) to send for persons, papers and records, to sit notwithstanding any adjournment of the House, to adjourn from place to place, and to report from time to time;

(b) to appoint specialist advisers either to supply information which is not readily available or to elucidate matters of complexity within the Committee's order of reference;

(c) to communicate to any other committee appointed under the same Standing Order (or to the Committee of Public Accounts or to the Deregulation Committee) its evidence and any other documents relating to matters of common interest;

(d) to meet concurrently with any other such committee for the purposes of deliberating, taking evidence, or considering draft reports.

MONDAY 13 JULY 1992

The following were nominated Members of the Committee:

Sir Nicholas Bonsor
Mr Menzies Campbell
Mr Churchill
Mr Michael Colvin
Mr Frank Cook
Sir Nicholas Fairbairn
Mr Bruce George
Mr John Home Robertson
Mr John McWilliam
Mr Neville Trotter
Mr Peter Viggers

Sir Nicholas Bonsor was elected Chairman on 15 July 1992.

On 6 March 1995 Mr Robert Key was added to the Committee in place of Sir Nicholas Fairbairn (deceased 19.2.95).

The cost of preparing for publication the Shorthand Minutes of Evidence published with this Report was £884.17.
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EIGHTH REPORT

The Defence Committee has agreed to the following Report:

PROGRESS OF THE TRIDENT PROGRAMME

I INTRODUCTION

Background

1. Since the House of Commons endorsed the Government's decision to proceed with Trident in March 1981 the Defence Committee has taken a regular detailed look at all aspects of the Trident programme and associated works. This year we can report the entry into service of the first Trident submarine, HMS VANGUARD, marking the beginning of a new phase in the life of the UK's strategic nuclear deterrent. New areas of concern have emerged such as the management of the handover from Polaris to Trident, the proposed Trident refitting facilities at Devonport and the rationalisation of the Atomic Weapons Establishment (AWE). Some longstanding issues continue to require scrutiny. Other problems noted in previous Reports have been resolved as the project nears completion. As ever, written and oral evidence from the Ministry of Defence (MoD) formed the basis of our inquiry; we also received memoranda from numerous interested individuals and organisations. The Committee had the opportunity in May to visit the Clyde Submarine Base at Faslane and the Royal Naval Armaments Depot, Coulport, where we received informative private briefings on the performance of our nuclear submarines and supporting facilities. We are most grateful to those who contributed to our visit to Scotland and to all others who assisted us during the course of this year's inquiry.

Progress

2. MoD reports that "1994 saw significant progress in all areas of the Trident programme".[1] VANGUARD entered operational service on schedule in December 1994 and the other three boats remain on course to meet their respective in-service dates (ISDs). Strategic and tactical weapons systems were both cleared in time for VANGUARD's first patrol. Though delays have continued to affect the shore construction programme, most notably in the achievement of full safety cases, the existing facilities are currently capable of supporting Trident boats. Total costs have again fallen this year and the submarine programme as a whole remains well within budget. In general terms, on the basis of the evidence received in public and in private, we can confirm that the Trident programme continues to make good progress.

Transition from Polaris to Trident

3. The years in which Trident submarines are to provide the continuous deterrent patrol before the full complement of four boats are in cycle will be particularly testing for existing resources. The second Trident boat, VICTORIOUS, is due to enter service at the end of 1995, to be followed by VIGILANT in 1998 and VENGEANCE around the turn of the century.[2] Since RESOLUTION paid off in October 1994 there have been only two Polaris boats in the patrol cycle: RENOWN and REPULSE. These are now beginning to show their age: HMS RENOWN has a defect related to her propulsion system and is currently under repair at Faslane.[3] We have received classified evidence on the exact nature of the problem and the prospects for repair. We visited HMS REPULSE in May when she was docked for routine maintenance and can report that while she remains in generally good shape, close on thirty years of active service have inevitably taken their toll. The possibility of one boat

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[1]Evidence, p 18

[2]HC Deb, 12 June 1995, col 363*w*

[3]Qq 1439-40

requiring prolonged unplanned maintenance or repair — as in the case of RENOWN — is the main reason why MoD has a preference for maintaining three boats in the operational cycle.[4] Nonetheless, it has been decided to pay off the last of the Polaris boats before the third Trident submarine becomes available.[5] Thus, for some period between 1996 and 1998 the deterrent will be provided by VANGUARD and VICTORIOUS without the back-up of a third boat. The exact timetable for paying off the last two Polaris boats has still to be determined, and will depend to some extent on the progress of work on RENOWN. There is, of course, no guarantee that remaining Trident boats will enter service on time. Whilst new Trident submarines could be expected to be more reliable than ageing Polaris boats, it is clear that any damage or malfunction requiring long-term maintenance would seriously jeopardise the overriding requirement to keep one SSBN at sea at all times. **In managing the withdrawal of the last two Polaris boats MoD should give due regard to minimising the period of a "two boat only" cycle to lessen the risks of unforeseen problems and to avoid an unduly heavy burden falling on the first two Trident boats and their crews.**

Costs

4. At an estimated £11,682 million the Trident programme is second only to the Eurofighter 2000 project in terms of its total demands on the defence budget. This current estimate is £2,511 million below the original 1981 estimate (at 1994-95 prices) and reflects nine successive years of reductions in the overall estimated cost. This year's fall of £211 million is substantial — almost ten times that of last year — and includes reductions in all elements of the programme bar that of shore construction.[6] The amount reserved for unallocated contingency has also fallen significantly — by £68 million — since last year: an indication of the diminishing potential for unexpected cost increases as the programme nears completion.[7] Expenditure in 1993-94 was £979 million, some £111 million less than was estimated last year.[8] Up to November 1994, £7.6 billion had been spent on the programme (at outturn prices), £5.5 billion in the UK and the remainder in the US.[9] The vagaries of the currency markets and changes to the American side of the programme can always disrupt calculations: MoD is wise not to rule out the possibility of future cost fluctuations.[10]

5. Trident is still estimated to absorb less than 2½ per cent of the defence budget over its 20 year procurement period.[11] MoD's estimate of running costs remains the same as last year's — £6 billion or £200 million annually over the life of the programme.[12] The figures for the breakdown of this total into manpower, refitting, in-service support, transport and stores, base running costs, AWE and decommissioning have not changed since 1993. Estimates of operating costs are likely to change, not least because of the study of crewing arrangements described below; the experience of operating VANGUARD should provide the practical information to support a more authoritative estimate next year.

Single crewing

6. We heard last year that the option of maintaining fewer than the originally planned "seven and a bit" crews for the four Trident boats was being studied.[13] In following up this study in oral evidence and during our briefings in Faslane we learnt that the study will include

[4] Q1444

[5] Q1436

[6] Evidence, p 21, A3a

[7] Q1415

[8] Evidence, p 21, A3b

[9] Evidence, p 21, A2

[10] Q1417

[11] Evidence, p 19, para 10

[12] Evidence, p 23, A5

[13] Second Report from the Defence Committee, *Progress of the Trident Programme*, HC 297 of Session 1993-94, paras 6-7

a trial on one Trident boat of a "single augmented crew".[14] The potential financial benefits of single crewing have been estimated to be around £5 million per annum.[15] However, the full impact on costs, capability and levels of operational support required will take some time to be fully felt and evaluated, particularly in the absence of experience in the US upon which to draw.[16] We note that a decision will "probably" not be taken until VIGILANT is in service.[17] In our view, it is essential that the trial takes place only when there are three boats in operation and sufficient crew trained to step in if the trial arrangements begin to prove unworkable. In the short term, it may well be possible for little more than a single crew to support one boat without apparent difficulty. Over a period of years, however, the strain on crews may begin to become too high for comfort and safety. Once single crewing is up and running, the temptation to avoid incurring the additional expenditure of an extra crew would no doubt be strong, but should be resisted if additional risks to the safety or operational capability of the Trident submarine fleet were to be incurred. **At some point, a definite decision on crew numbers will need to be taken on the basis of the evidence: we would be concerned if a long running "experiment" was allowed to drift quietly into a *de facto* policy. We therefore welcome the Department's pledge to inform us as soon as a decision is taken,[18] and will continue to pay close attention to the progress of the trial until that time.**

II PROGRAMME ELEMENTS

Submarines

7. HMS VANGUARD's deployment followed a successful demonstration and shakedown operation (DASO) off Florida involving two missile firings in May/June 1994.[19] On her way to King's Bay, Georgia, to collect her D-5 missiles damage was sustained to the propulsor when it ingested part of the towed array of the sonar system, which was hanging from the stern, although not deployed. Rear Admiral Irwin, Chief Strategic Systems Executive, explained that, although damage was slight and power transmission into water was unaffected, "as regards noise it was extremely important and we had to do some work to pare down the shape of the propulsor".[20] The cost of this work was "minor" and had no effect on performance.[21] Nonetheless, it is disturbing that VANGUARD was expected to negotiate a narrow river when the risks of ingesting the towed array were well known. Rear Admiral Irwin explained —

> "It is one of the difficulties of carrying a towed array behind you that if you have to make a manoeuvre like going astern then you are in danger of ingesting it".[22]

The long term solution to the problem is to be addressed as part of the continuing work on the handling of the sonar suite.[23] We trust that precautions will be taken to ensure that VICTORIOUS does not suffer similar problems when she collects her missiles from King's Bay. VANGUARD began her second patrol in spring 1995 and her performance so far is judged to be "very satisfactory".[24] Although there are still some improvements to be made to the tactical weapons system, given the scale and complexity of the project and the history of procurement programmes in general, **the deployment of the first Trident submarine,**

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[14]Q1449

[15]Second Report, HC 297 of Session 1993-94, para 6

[16]Q1451

[17]Q1449

[18]Q1449; Fourth Special Report, HC 660 of Session 1993-94, para 3

[19]Evidence, p 18, para 2

[20]Q1420

[21]Qq 1421-23

[22]Q1422

[23]Q1426; see paras 14-15

[24]Evidence, p 23, A6

fully operational and on time, represents a considerable achievement.

8. The second Trident boat, VICTORIOUS, has faced a more demanding schedule than VANGUARD and last year MoD expressed concerns that it might prove too tight.[25] Progress since then has been good. Following successful contractor sea trials and the completion of further work by the contractor she was accepted by the Royal Navy at Faslane in January 1995; the standard of finish and performance is regarded as "very good".[26] After post acceptance trials and the work up of crew, VICTORIOUS will sail to King's Bay to collect 12 D5 missiles.[27] Rear Admiral Irwin expressed "high confidence" that she will deploy on time at the turn of the year.[28] VIGILANT is due to be rolled out of the Devonshire Dock Hall at Barrow later this year. The construction of VENGEANCE continues: all missile tubes are now in place and the major hull units are being joined together. No problems are reported in respect of either boat.[29]

9. The estimated real costs of the submarine construction programme have fallen by £70 million since last year.[30] The overall reduction is the result of numerous minor cost adjustments: savings include £14 million in the cost of support and spares, £5 million from changes in the VAT regime and the reallocation of a further £5 million from construction into running costs. These have been offset by a £12 million increase due to additional use of design agency services and another £8 million for work not included in the original contract.[31] With the programme approaching completion, the current estimate of £4,243 million at 1994-95 prices is regarded by MoD as increasingly firm.[32] This is reflected in the reduction of the allocated contingency by £24 million to £40 million[33] and an estimated fall of £40 million in the cost of the final two submarines.[34] Now that VANGUARD is operational and VICTORIOUS is completing post acceptance trials the scope for further cost increases is significantly narrowed and there may well be further savings to be achieved in the construction of the final two boats due to refinement of production techniques in the light of experience. We would be disappointed if the current overall estimated programme costs were exceeded.

Strategic Weapon System

10. The development of the Strategic Weapon System (SWS) has proceeded well. VANGUARD's two test firings of unarmed missiles off Florida last summer were reported to be "highly successful".[35] She subsequently collected 16 D5 missiles from King's Bay which were fitted with nuclear warheads on the Clyde and cleared for deployment. VICTORIOUS is scheduled to undertake test missile firings during her DASO later this summer. The testing and installation of SWS equipment in the remaining two Trident boats is said to be making "steady progress".[36] The modifications required for the use of Trident in a sub-strategic capacity are intended to be completed by the time VIGILANT enters service in 1998 and Trident assumes the sub-strategic role.[37]

11. We reported last year that 44 D5 missiles had been purchased from the US, and this

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[25]Second Report, HC 297 of Session 1993-94, para 10

[26]Evidence, p 23, A6

[27]HC Deb, 9 May 1995, col 405*w*

[28]Q1427

[29]Evidence, p 23, A6

[30]Evidence, p 21, A3a

[31]Q1418

[32]Evidence, p 20, A1b; Q1418

[33]Evidence, p 22, A3e

[34]Q1418

[35]Evidence, p 18, para 4

[36]*ibid*

[37]Evidence, p 24, A9

remains the current total.[38] MoD insists that final decisions have yet to be taken on the number of missiles to be procured,[39] but some idea can be gained by the fact that £718 million[40] at outturn prices out of a total estimated cost of £1,240 million (at 1994-95 prices) had been committed by August 1994:[41] some 58 per cent. We expressed some concern last year that a reduced US missile programme would lead to an increase in the unit cost of missiles procured by the UK. Since then the US mid-term elections and nuclear posture review seem to have ensured that production will continue for some years yet. This was certainly the impression we gained in Washington when we visited in March 1995 and it is shared by MoD.[42]

12. Recent speculation has focused on the potential increases in unit cost resulting from the fixed costs of production being spread over fewer missiles each year. MoD acknowledged that "there is some possibility of that happening" but denied that "mind-bendingly large increases are in the pipeline".[43] There have already been some increases in costs on the US side since last year: £27 million due to the inclusion of additional contract incentive fees falling to the UK, £11 million from an increase in US estimates of missile costs and £12 million due to a revision of in-year expenditure estimates. These expenses have been partly offset by £20 million savings resulting from a reduction in the number of guidance parts required. However, the major contributor to the overall £26 million reduction in the estimated real costs of D5 missiles was the £55 million saving due to the effects of exchange rate fluctuations on actual spend in 1993-94.[44] Without this favourable movement in the currency markets MoD acknowledged that the increase in missile programme costs would have been "somewhere between £25 million and £30 million"[45] — more than twice the sum of the contingency allocated this year for the whole SWS programme. Without an increase in contingency — and this was reduced by £9 million since 1993-94[46] — or beneficial exchange rate movements, any similar increases in unit costs to those experienced last year would begin to eat into unallocated contingency, which currently stands at £153 million.[47]

13. In spite of the threat of some increases in actual missile costs, MoD remains committed to its original timetable for procurement, now forecast to complete in two to four years' time.[48] Figures relating to the numbers of missiles likely to be purchased over this period emerged in error from the US Government this year. MoD were quick to identify these as "very provisional figures" and were anxious to assure us that "Ministers have not yet taken a decision on the size and timing of future UK orders".[49] Witnesses told us that the containment of costs was being looked at very closely with US counterparts,[50] but emphasised the need to avoid a situation in which large numbers of missiles reached the end of their 20 year life spans simultaneously, and also the benefits of tailoring procurement to fit the submarine construction timetable.[51] **MoD should not allow these factors to tie it so tightly to its planned procurement programme as to incur heavy financial penalties in future years. We note that no missiles have been purchased in either of the last two years, when the exchange rate has been relatively advantageous. Given the warning signs already appearing, and trailed in our Report last year,[52] it would be inexcusable**

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[38]Second Report, HC 297 of Session 1993-94, para 17

[39]HC Deb, 25 April 1995, col 497*w*

[40]HC Deb, 25 November 1994, col 461*w*

[41]Evidence, p 20, A1b

[42]Q1458

[43]*ibid*

[44]Evidence, p 29, A2

[45]Q1457

[46]Evidence, p 22, A3e

[47]*ibid*

[48]Evidence, p 24, A9c

[49]Q1464

[50]Q1458

[51]Q1459

[52]Second Report, HC 297 of Session 1993-94, para 18

if a reluctance to accelerate missile purchases led to significant subsequent cost increases as a result of procurement decisions taken in the US.

Tactical Weapon System

14. The development of Trident's Tactical Weapon Systems (TWS) has long been a major weakness of the programme. Problems relating to the Self Protection Mast have now been resolved, although we heard last year that "some elements of the system's capability have still to be demonstrated fully".[53] Though the TWS was cleared to support VANGUARD's deployment, it remains below full capability. **The Sonar 2054 system is the main cause of concern.** Early trials of the system identified operability and reliability problems which we explored further in oral evidence. Rear Admiral Irwin explained that the towed array handling system — consisting of a drum around which the array is reeled — was not reliable enough to be used. Problems experienced in reeling the towed array, which is hundreds of yards long, back onto the drum, were apparently caused by the impact of changes in depth on some parts of the array.[54] Rather than being deployed at sea, the towed array has to be attached and removed manually at base, an exercise which he described as a "thorough nuisance".[55] The trials carried out from the back of surface ships may have been successful but were clearly not a realistic test for a system designed to be used at some depth. Rear Admiral Irwin explained that to trial the array on SSNs would not be straightforward: "It is not just something you can fit to a submarine without making changes".[56] We are nonetheless surprised that it was not thought wise to conduct trials of the system — or at least a similar version — on other submarines. Nor can we be wholly optimistic about the prospects for speedy resolution of the problem. Rear Admiral Irwin told us he "would not wish to be held too closely" to the programme for repair, which sees completion by the end of this year.[57] **It is disturbing that the longstanding problems identified with the towed array sonar are still to be resolved, and that the first Trident boat has had to deploy with a vital system less than fully operational.**

15. Concerns over the progress of the sonar suite are not new. We were informed in the 1993 annual report on Trident that contractor's sea trials of all Sonar 2054 equipments had been completed "with the exception of the Towed Array".[58] It was only during the subsequent oral evidence session that we established the reasons for the delay: a towed array was lost at an early stage in the trial and enquiries followed into the cause over a period of months, preventing the integration of the towed array with the rest of the sonar suite.[59] The 1994 annual report revealed that "considerable progress" had been made in resolving the problems identified in the sea trials.[60] The likely cause of the fault was reported to relate to assembly rather than production; changes in procedures were expected to avoid further problems.[61] It was acknowledged that some elements of the system's capability had still to be tested; these tests were planned to take place in advance of VANGUARD's entry into operational service.[62] In answer to our written questions this year MoD told us that "some problems" with the sonar suite still remained and that "a programme of work to resolve some outstanding system operability issues is in hand".[63] It was not reported, either in writing or orally, that the Sonar 2054 was one of only three projects identified in the 1995 Departmental Report as having the status of "major weakness".[64] This designation was given as a result

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[53] Second Report, HC 297 of Session 1993-94, para 20

[54] Q1484

[55] Q1481

[56] Q1486

[57] Q1482

[58] Sixth Report, HC 549 of Session 1992-93, Evidence, p 26, A6a

[59] *ibid*, para 29

[60] Second Report, HC 297 of Session 1993-94, Evidence, p 21, para 5

[61] *ibid*, Evidence, p 9; Q1167

[62] *ibid*, Evidence, p 25, A5a

[63] Evidence, p 23, A7a

[64] Evidence, p 33

of problems coming to light in initial contractor sea trials — a fact that was gleaned only as a result of our written questions on the Departmental Report, unrelated to this inquiry. Given our long term interest in the progress of the TWS we might legitimately have expected to be informed as to any significant problems arising out of the contractor sea trials. **We regret that MoD did not feel it appropriate to be more forthcoming about the problems with Sonar 2054; we hope that the omission was not an attempt to hide the scale of the problems affecting the sonar suite, and the towed array in particular.**

16. The Submarine Command System (SMCS) programme has also experienced some delays, and MoD reported last year that it was "very tight".[65] The command system with which VANGUARD eventually deployed was less than perfect. Officials told us that, though adequate, its poor reliability required back-up hand systems to recover data in the event of the system crashing.[66] A new issue of software, featuring automatic back-up, is currently being tried in both VICTORIOUS and VANGUARD. Again, whilst officials assured us that the current system is adequate, the target for programme completion of mid-1995 has not been met, and, due to the "very high reliability criteria we set ourselves", is unlikely to be achieved in the near future.[67] **High reliability criteria should be an established prerequisite of any project, not an excuse for delay. We look to MoD to minimise further slippage.**

17. The estimated cost of the TWS, which fall almost entirely in the UK, has declined by £15 million, following last year's £27 million drop, though these reductions follow increases of some £58 million between 1991 and 1993.[68] For the third successive year, no contingency has been allocated to the TWS programme, despite the difficulties encountered and the likelihood of further delay to the SMCS at least. We hope that this confidence is not misplaced and trust that the current work on the TWS of VICTORIOUS and VANGUARD will enable the remaining two Trident boats to be equipped with fully operational systems at the start of their service lives.

III SHORE CONSTRUCTION

Faslane and Coulport

18. In previous years the Committee has examined various aspects of the massive Trident works programmes at Faslane and Coulport and frequently expressed concern over failings in contract management and consequent delays. The financial management of the programme has been recently subjected to detailed scrutiny by the National Audit Office, building upon much of the information we have acquired over the years; it reported its findings to Parliament in July 1994.[69] We do not seek to dwell upon the reasons for the prodigious increase in costs, which are currently estimated to be £823 million above the 1981 estimate (at 1994-95 prices):[70] the Department has already completed an internal examination of lessons to be learnt in respect of financial management and contract control.[71] **We will look with particular care at future projects — such as the refitting facility to be built at Devonport — to check that none of the encyclopedia of errors made in the shore construction programme in Scotland are repeated.**

19. The shiplift at Faslane has suffered from innumerable delays during its construction. It was finally handed over in July 1993 (two and a half years late) and was expected in March

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[65]Second Report, HC 297 of Session 1993-94, para 20

[66]Q1489

[67]Qq 1489-90

[68]Second Report, HC 297 of Session 1993-94, para 23

[69]Report by the Comptroller and Auditor General, *Ministry of Defence: Management of the Trident Works Programme*, HC 621 of Session 1993-94. The Committee of Public Accounts published its Report on the *Management of the Trident Works Programme*, HC 486, on 5 July 1995.

[70]Evidence, p 20, A1b

[71]Report by the Comptroller and Auditor General, HC 621 of Session 1993-94, para 26

1994 to have received its full design safety case by the end of that year.[72] This date has now slipped to "this year".[73] However, the facility is able to conduct lifts of nuclear submarines provided it has the prior approval of the safety authorities: VANGUARD was successfully lifted last October and further lifts are planned. In the course of our recent visit to Faslane we were briefed inside the shiplift on its current capabilities and were pleased to hear that the facility is performing well. The RN is in close contact with the safety authorities, allowing the gradual development of the shiplift's work as the safety case is expanded. Once fully operational, the shiplift will provide a hugely impressive and technically remarkable facility to add to the existing floating dock. It was announced in May that existing facilities for nuclear powered submarines are to be reviewed in the light of new safety requirements and longer than expected refitting periods, with consideration being given to the extension of nuclear work at Rosyth beyond the planned deadline of 1997.[74] We trust that some attention will also be given to the future of the floating dock at Faslane, and that full account will be taken of the advantage of retaining sufficient capability at Faslane to handle the demands made by the increasingly unreliable Polaris submarines, particularly in the light of restrictions in the use of the emergency dock at Rosyth until early 1997.[75]

20. Of the other Trident related facilities in Scotland only the crane on 12 Berth at Faslane remains without a full safety case, and this is being considered by the safety authorities at the moment, ahead of the original timetable.[76] All facilities at Coulport have safety clearance now, including the floating Explosives Handling Jetty. Like the shiplift, this facility is a considerable achievement in engineering terms; in the course of our visit to Coulport, we were briefed inside the facility on its satisfactory performance.

Devonport

21. Since the Committee reported on the decision to undertake Trident submarine refitting at Devonport Royal Dockyard we have followed progress towards placing the contract for the design and build of the required facilities. The notice of proposed development was approved by Plymouth City Council in February 1995.[77] We were told in 1994 that the intention was to issue an Invitation to Tender (ITT) to Devonport Management Limited (DML) during summer 1994 and to place a contract by the end of the year, with a view to commencing construction in early 1996.[78] The Government assured us that "all necessary steps will be taken to ensure that the project proceeds to time and cost".[79] The response to the ITT was received late in 1994 but was then subject to "clarification of a number of important issues with the Company".[80] Rear Admiral Irwin told us that negotiations with DML were continuing and the establishment of the fixed price contract was "taking a little time, longer than we had perhaps hoped".[81] Further written questions confirmed the slippage in the original timetable: the "hope" is now to place a contract before the end of summer 1995 — one year late; construction is now intended to begin during the summer of 1996, and complete around the turn of the century.[82] Rear Admiral Irwin was nonetheless confident that the facility would be completed on time.[83]

22. The reassessment of nuclear docking facilities announced in May 1995 aroused some concern over the cost implications for all refitting work of meeting the more stringent safety

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[72]Second Report, HC 297 of Session 1993-94, para 43

[73]Evidence, p 25, A15

[74]HC Deb, 17 May 1995, col 229*w*

[75]Q1536

[76]Q1533

[77]Q1545

[78]Second Report, HC 297 of Session 1993-94, Evidence, p 46, A37

[79]Fourth Special Report of Session 1993-94, HC 660, Annex A, para 13

[80]Evidence, p 29, A4

[81]Q1542

[82]Evidence, p 29, A4

[83]Q1542

requirements. MoD reported that the detailed impact on SSN refit plans and the surface ship refit arrangements announced in 1993 would not be known before the end of the summer and that the additional costs and timescale of the work at Devonport could not yet be estimated.[84] We also sought specific assurances that the need to adhere to improved safety standards would not affect the original cost estimate of £190 million for the new Trident refitting facilities to be built at Devonport. The Secretary of State told us that he was "not aware of any problems in that area".[85] The Department subsequently confirmed that, although the full scope of the work had yet to be established, —

> "The current difficulties affect only existing nuclear submarine docking facilities. They will have no direct impact on the planned provision of refit facilities for Trident submarines which will take account of the more stringent nuclear safety requirements from the outset."[86]

Given that the controversial decision to base future nuclear submarine refitting at Devonport rather than Rosyth was based entirely upon highly marginal cost considerations, we would be particularly disturbed by any escalation in real price. The design must be sufficiently detailed to avoid the need for significant later revision and to ensure that the nuclear safety case is established in good time. The delays encountered so far and lingering concerns over the impact of new safety requirements do not enable us to share MoD's confidence that the refitting facility will be completed on schedule and within budget.

Cost

23. Last year's Supply Estimates incorrectly omitted the overall Devonport nuclear submarine shore support facilities. In SDE 95, their cost was shown as £331.769 million, almost £40 million below the original estimate.[87] MoD told us that this "apparent reduction...reflects a reassessment of the level of risk to be funded in the programme. The figures provided in the SDE are for planning purposes only....".[88] The overall real costs of the shore construction programme, exclusive of dockyard projects, has dropped by £10 million (at 1993-94 prices) over the last 12 months. Last year's £11 million fall in contingency has been followed by a further £3 million drop to £14 million.[89] The dockyard projects and functional machinery element of the programme is the only estimate to have seen an increase this year: £48 million with an additional £5 million to the allocated contingency.[90] This increase follows the decision to refit Trident submarines at Devonport rather than Rosyth and is based upon a reassessment of the proportion of the costs that arise at Devonport solely as a consequence of its use to refit these boats.[91] The change is one of attribution: there is no effect on the dockyard project itself or on the defence budget as a whole, and we were warned to expect further fluctuations as the design for the refitting facility is refined.[92] **Given that work on the design has been in train for some time, and must be reasonably advanced, we would be surprised to see future changes in budget allocation of such a significant scale. We will be watching carefully.**

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[84]Evidence, p34

[85]Report on SDE 95, HC 572 of Session 1994-95, Evidence, Q2047

[86]Evidence, p 34

[87]SDE 95, Annex E, project 7 and footnote

[88]Report on SDE 95, HC 572 of Session 1994-95, Evidence from MoD, A1f

[89]Evidence, p 21, A3a

[90]Evidence, p 32, A3a

[91]Q1526

[92]Qq 1548-9

IV SAFETY

Tests

24. The successful negotiation of an indefinite extension to the Non Proliferation Treaty in May 1995 provided an encouraging background to the continuing work on a Comprehensive Test Ban Treaty (CTBT). SDE 95 reports that real progress has been made during the past year on this front and that the UK is playing a full and constructive part in negotiations.[93] The Government's support for a global and internationally verifiable CTBT is founded upon the confidence that previous tests have proved beyond doubt the reliability of our nuclear weapons. Witnesses confirmed that no further underground tests will be sought while the current US moratorium — now extended to September 1996 — remains in place.[94] On 14 June 1995 President Chirac announced that France would conduct eight tests between September 1995 and May 1996, concluding the series of tests broken off in April 1992. He confirmed France's intention to sign the CTBT in the autumn of 1996, subject however to being in a position to ensure the safety and viability of its deterrent and to it being possible to "passer à la simulation". Fears that this announcement would have a knock-on effect have not been realised thus far: the US Government has not expressed an intention to follow the French lead and the Secretary of State confirmed in evidence to us on 26 June that the Government has "no plans" to resume nuclear testing.[95]

25. If the prohibition of full scale tests need not be an immediate concern for the UK the safe maintenance of our nuclear capability nonetheless requires some work on the various weapons components. MoD told us that a CTBT which permitted no activity producing any fission yield whatsoever would be a "very severe limitation".[96] Though the precise limits of nuclear testing are still to be negotiated, the constraints likely to be imposed by a CTBT would leave MoD far more reliant on the development of above ground (non nuclear) experimental (AGEX) facilities at AWE Aldermaston. There already exists a capability in the use of computer simulation, lasers and radiographic facilities to analyse the behaviour of warheads,[97] but MoD emphasised that the existing techniques are not at present an adequate substitute for an underground test.[98] We were therefore reassured to learn that MoD is "spending additional money and additional resources to develop these techniques further in order to provide the capability we require in the absence of underground testing".[99] Other nuclear powers are of course similarly affected by the prospect of a CTBT and last year we urged greater co-operation with the US and France in non-nuclear testing.[100] MoD reported on some technical discussions with the French on issues related to nuclear weapons stewardship such as hydrodynamic experiments and computer simulation. Progress has not been swift: the discussions are still at an exploratory stage — too early to predict where they will lead.[101] Whilst Britain would want to retain a capability to test independently, an efficient use of resources may involve some specialisation. Witnesses told us that although we are establishing facilities which are very similar to those of the US, UK developments complement rather than duplicate their resources.[102] If facilities are of the requisite type and quality, there may be considerable potential for the French and Americans to be invited to conduct work at Aldermaston which may go some way towards filling the void created by a CTBT. **We look to MoD to provide the resources to facilitate the widest possible use of existing expertise and facilities at AWE and to pursue with vigour the prospects for future co-operation with appropriate allies in non-nuclear testing.**

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[93]SDE 95, para 353

[94]Q1498

[95]Report on SDE 95, HC 572 of Session 1994-95, Evidence Q 2082.

[96]Q1520

[97]Q1511

[98]Qq 1514-17

[99]Q1511

[100]Second Report, HC 297 of Session 1993-94, para 35

[101]Evidence, p24, A10

[102]Q1514

the Department's interest to publish that fact, the better to allay public anxiety. We recognise that security concerns would limit the scope of publication but note that regulatory bodies and the Health and Safety Executive publish reports which are informative but avoid disclosing confidential information. **There is no reason why the nuclear safety champion should not be permitted to report to Parliament on the broad thrust of his activities and findings and to this Committee in greater detail, classified as appropriate: this would go some way to improving public confidence in the safety of our nuclear deterrent. We urge the Government to reconsider.**

V AWE

Background

29. The production and servicing of Trident's nuclear warheads is carried out by the Atomic Weapons Establishment (AWE), operating from sites at Aldermaston, Burghfield, Cardiff and Foulness. Since April 1991 the Establishment has been run on a Government-owned contractor-operated (GO-CO) basis: the Hunting-BRAE consortium won the original interim contract and is currently engaged in a seven year contract to manage AWE until April 2000. The contractor's performance, in terms of safety, security and production, is monitored on behalf of MoD by the Compliance Director. We have examined the work of AWE annually, both prior and post contractorisation, and have expressed concerns over the development of new production facilities, the retention of staff and the ability of the contractors to attract new work to supplement diminishing warhead production. At the time of our inquiry last year two separate reviews were underway: one by the Health and Safety Executive (HSE) of the management of health and safety; the other by Hunting-BRAE considering the potential for improving the efficiency of operations, if necessary, by some site rationalisation. Both these reviews have since completed.

Rationalisation

30. The outcome of the contractor's review was announced in the House on 20 January 1995.[113] Once the production of beryllium and depleted uranium components at Cardiff is completed in 1997 the site will close. The continuing need for a small quantity of these components for trials purposes will then be met by an expansion of existing capability at Aldermaston. A number of laboratory-based activities at Foulness will move to Aldermaston by 1998: the remaining activities requiring a remote location will become the responsibility of the new Defence Science and Technology Agency. At Burghfield, the completion of Trident components will leave many specialist capabilities redundant. Those that are still required will move to Aldermaston, leaving around half of the site area to be decommissioned in the period up to 1999. The total cost of these moves is estimated at £17 million.[114] The rationalisation will, according to the Minister for Defence Procurement, allow "sensible economies to be made without in any way affecting our ability to meet present and future needs".[115]

31. The present plans for rationalisation were by no means unexpected. Since the Government's decision in 1993 to rely on Trident for a sub-strategic capability rather than procure a successor to WE-177 the future role of AWE has been in need of some redefinition. The early withdrawal of WE-177 and the imminent CTBT will further lighten the workload. We warned last year that -

> "The completion of the Trident programme, with no clear programme of production to follow, may well leave a large and costly proportion of AWE facilities lying idle".[116]

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[113]HC Deb, 20 January 1995, col 751*w*

[114]Evidence, p 28, A1-2

[115]HC Deb, 20 January 1995, col 751*w*

[116]Second Report, HC 297 of Session 1993-94, para 48

WE-177

26. It was announced in October 1993 that the Tactical Air-to-Surface missile programme would not be pursued and that Trident would provide the UK's sub-strategic as well as strategic nuclear capability. The preparation of the missile for a sub-strategic role involves a relatively simple alteration to the warhead and the cost implications are said to be minimal. Although the role for which the WE-177 free fall bomb was procured would be fulfilled by Trident it was still the intention as recently as March 1994 to keep it in service until 2007.[103] This would leave an overlap — a dual sub-strategic capability — of 11 years. The lifespan of the WE-177 was under review when we took evidence from MoD in March 1995 and we heard that the 50 per cent already withdrawn were being dismantled.[104] A few days later it was announced that the WE-177 would be withdrawn from service in 1998, when the third Trident boat is due to enter service.[105] The revision of the retirement date is an inevitable consequence of the 1993 decision to expand the Trident role and is wholly sensible: it would be excessive to maintain a duplicate sub-strategic weapon. Nonetheless, the WE-177 can still serve a useful purpose. Each year the weapons are stripped down and their components checked for signs of ageing: knowledge gleaned from this continuous assessment can then be applied to Trident warheads.[106] Witnesses expressed optimism that the Trident system would be capable of lasting beyond its 25 year minimum requirement.[107] **In welcoming the decision to curtail its active life, we emphasise the benefits of maintaining a small number of WE-177 warheads in order to monitor the effects of ageing on nuclear warheads.**

Nuclear Safety Champion

27. The nuclear weapons safety champion began work in January 1994 under a wide remit to examine and advise on all matters relating to the safety of nuclear weapon systems. He has already carried out a series of audits and has made recommendations on the future design of nuclear weapons and their storage. MoD witnesses reported that he had "added a lot of value to safety" and had provided a "comprehensive and independent" input.[108] His current and planned programme of work covers SWS safety, weapons transportation, the WE-177, the Trident sub-strategic capability, research at AWE and a comparison with the US approach to weapons safety.[109] **We are pleased to see that the resources available to the safety champion have enabled him to pursue such a broad range of issues and believe that his independent advice is a valuable addition to the Trident programme.**

28. **We are disappointed, however, that the true value of the nuclear safety champion's work seems destined to remain forever hidden. Last year we recommended that "in addition to his access to Ministers, he should have a right to report to Parliament".[110] The Government rejected this proposal on the grounds that "independent access would undermine the principle of direct Ministerial accountability".[111] We strongly reject this argument. It is only through the study of this type of independent scrutiny that Parliament *can* properly perform its role of holding Ministers to account.** We were told that publication was not warranted because "he has not found any safety worries that should be exposed, anything that is of any great import".[112] The power to determine what should or should not be exposed to public scrutiny might be exercised very differently by a Minister than by an independent source. If safety procedures are genuinely good, we would see it in

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[103]HC Deb, 8 March 1994, col 136

[104]Q1590

[105]HC Deb, 4 April 1995, col 1097*w*

[106]Qq 1585-6

[107]Q1587

[108]Q1574

[109]Evidence, pp 24-5, A12

[110]Second Report, HC 297 of Session 1993-94, para 39

[111]Fourth Special Report of Session 1993-94, HC 550, Annex A, para 11

[112]Q1576

In reply, the Government assured us that "this will not be the case" as the programme of work supporting warhead capability would be "substantial".[117] The task of maintaining in-service support for Trident warheads may be "very demanding",[118] but will not be anywhere near enough to fully occupy existing capacity. The scale of the closures announced serve to bear this out.

Diversification and Research

32. The avoidance of further deep cuts at AWE depends upon its ability to expand its research programme and to explore areas of work other than nuclear weapons. We learnt on our visit to Aldermaston in 1994 something of the potential for adapting existing facilities for new uses but gained the impression that "future diversification had an unduly low priority".[119] We reported that -

> "without some form of future diversification, and maintenance of a demanding research programme, it will become difficult to justify the scale of public funding for AWE such as to maintain the capability to sustain the maximum standards of safety and efficiency in this uniquely specialised field".[120]

Again, the Government sought to assure us that AWE was "fully conscious" of the benefits of diversification and were developing a "demanding" long term research and development programme in respect of warhead design and validation.[121] We heard in evidence this year that diversification had progressed "disappointingly" and that "efforts made so far have not produced any hard evidence of diversification".[122] Small amounts of work had been obtained in specialised fields such as beryllium manufacture and explosives trials but volume was thought unlikely to increase significantly.[123] **Given the amount of warning time available it is depressing that so little in the way of alternative work and research has been attracted, especially in the wake of the Department's optimism of last year. We will be looking for evidence of progress in this area in the coming year.**

33. Responsibility for promoting diversification lies with the contractor and is included in the contract with MoD.[124] The impetus for rationalisation clearly derives from the Government. Rear Admiral Irwin told us that MoD had tasked AWE to "match future capacity to future workload while retaining capability". Hunting-BRAE had made "a good start but there is much further to go: I wish to see rationalisation of Aldermaston itself...".[125] In one sense, MoD's candid enthusiasm for rationalisation (and it is funding the costs of implementation[126]) is not surprising, given that the Department rather than the contractor is expected to be the major beneficiary of the resulting financial savings, the extent of which are obscured by classification.[127] It nonetheless seems slightly anomalous for the Government to be asking the contractor to rationalise its operations while at the same time expecting it to seek alternative sources of work in order to guarantee its future. **We recognise the financial benefits that rationalisation may bring; but some positive incentive to Hunting-BRAE to pursue diversification with more zeal would be beneficial.**

34. We note that the Compliance Director has confirmed that the existing rationalisation proposals have accounted for the need to safeguard all aspects of the UK's nuclear

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[117]Fourth Special Report, HC 660 of Session 1993-94, para 14

[118]SDE 95, p 77, para 2

[119]Second Report, HC 297 of Session 1993-94, para 50

[120]*ibid*

[121]Fourth Special Report, HC 660 of Session 1993-94, para 15

[122]Qq 1556-7

[123]Evidence, p 24, A24

[124]Q1557

[125]Q1414

[126]Evidence, p 29, A5

[127]Q1562; HC Deb, 9 February 1995, col 411*w*

capability.[128] Any future curtailment of AWE Aldermaston's activities must only proceed after a thorough examination of the potential for alternative usage, and with cast-iron guarantees that the long term support of the warheads in service is not in any way put at risk.

Programme of works

35. The facilities supporting the production of Trident nuclear warheads and the disposal of resulting waste are currently in the process of being replaced. Commissioning of these new facilities is reported to be progressing satisfactorily and has enabled warhead production to continue to meet requirements.[129] We recorded last year that the plutonium pit processing plant, A90, had, after multiple delays, entered red commissioning: Bays 1 and 2 were due to be in full production by the close of 1994 and Bays 3 and 4 were forecast to commence red commissioning around the same time.[130] Again, this schedule has proved unachievable. The first plutonium pit produced entirely in A90 is now planned to be completed in late autumn 1995 and the completion of commissioning is also not expected until the end of this year. The delay is said to be due to the "complexity of the work and the higher standards of safety documentation now being produced".[131] A91, the radioactive liquid effluent treatment plant, has also been dogged by technical problems, although we note that the cost of rectifying the corrosion problems from which it has suffered has fallen slightly to £15 million this year.[132] It is due to enter red commissioning in late 1996 and to enter service in spring 1997.[133] It is only when A90 is operating satisfactorily that the existing A1.1 can be shut down and then decommissioned. **We have already expressed anxiety at the prospect of a facility constructed around thirty years ago being required to continue its working life and can only register dismay at the further delay to the A90 plant. We expect the Compliance Office to monitor the health and safety at the A1.1 production plant with particular care and in due course we will take a close interest in the decommissioning of redundant facilities.**

Safety

36. The report by the Health and Safety Executive on the management of safety at AWE was published in October 1994 and we welcome the fact that MoD allowed it to be published in full. We became aware of many areas of concern on our visits last year and saw that much had been done to rectify faults or weaknesses in procedure already. The report confirmed our impression that Hunting-BRAE had shown a greater commitment to health and safety matters than had previously been apparent although it highlighted a number of "significant inadequacies" in management arrangements. MoD told us that the programme of implementation is on schedule and will be monitored closely by the Compliance Office and reviewed by the HSE itself later this year.[134] Only one of the 65 recommendations was directed at MoD rather than the contractor, and required AWE's immunity from licensing under the Nuclear Installations Act 1965 to be waived. Though MoD already aims to comply voluntarily with licensing standards it has accepted this recommendation in principle.[135] We welcome this acceptance that AWE should be placed on the same statutory footing as other nuclear installations: the establishment of direct and overt oversight by HSE is a sensible step towards easing legitimate public concerns over nuclear safety. The estimated additional cost is some £6.75 million, the bulk of which is attributable to the manpower costs of writing the safety cases required.[136] The full licence is expected to be granted in 1997. Whilst the

[128]Evidence, p 27, A23

[129]Evidence, p 18, para 6

[130]Second Report, HC 297 of Session 1993-94, para 51

[131]Evidence, p 27, A17

[132]Evidence, p 27, A19

[133]Evidence, p 27, A18

[134]Q1563

[135]HC Deb, 18 October 1994, col 240

[136]Evidence, p 28, A27

devotion of extra resources could speed up the process we agree with MoD[137] that the tone of the HSE report does not warrant the possible sacrifice of parts of the existing safety programme and that the 1997 licensing target represents a sensible compromise.

37. The HSE report has not had a significant impact on the costs of the Programme of Safety Works and Safety Development Programme already planned by the contractor. The details of these programmes are still to be finalised and will take account of both the rationalisation and the HSE report. Last year's estimate — based on the contractor's assessment — of £300 million has since been revised to around £250 million.[138] The timetable for implementation remains unclear, as does the division of responsibility for bearing the costs. A proportion of the costs may be met by sums allocated for routine maintenance and by savings resulting from rationalisation. **However this work is eventually financed we would expect to be informed of any significant additional sums to be provided by MoD in the course of this work.**

Manpower, pay and conditions

38. The contractorisation of AWE has led to significant improvements in the recruitment and retention of staff. We have commented in previous reports that the drop in staff shortfalls over the last two years has eased earlier concerns over the ability of AWE to attract staff of the right calibre and experience to continue the work in hand.[139] Progress has been consolidated over the last 12 months: vacancies across all four sites are more or less static at 118 (less than 2 per cent of the workforce) and are almost exclusively at Aldermaston.[140] The overall turnover has increased from 5 per cent to 9.5 per cent, although this is largely due to the inclusion of 306 voluntary redundancies. The underlying rate (ie excluding these redundancies) is 4.6 per cent.[141] Safety and information systems continue to be the main recruiting areas. The recruitment of specialist staff is, however, a growing concern. The number of vacancies at Aldermaston has risen by 24 to 81 since last year.[142] We were told that the gaps — principally in the areas of system development and the AGEX programme — had been filled by short term contractors.[143] Though MoD assured us that programmes had not so far been affected, the long term viability of work may be threatened if continuity cannot be maintained. AWE may already seem an unattractive option to well qualified scientists given the relatively poor pay offered and the knowledge that the bulk of future work lies in the maintenance of existing weapons rather than the more challenging development of new ones. The proposed rationalisation, and the prospect of more cuts at Aldermaston, can only detract further from its appeal. Difficulties in staffing the AGEX programme — a major part of AWE's future — are a particular concern as there is, we were informed, a countrywide shortage of the required design mathematicians and mathematical physicists.[144] **We note MoD's confidence that the shortfall will be met: it must ensure that there is no adverse effect of staff shortages on the development of AGEX programmes.**

39. We noted last year that one of the attractions of contractorisation from an employee's perspective was an assurance that efficiencies achieved could in future be translated into pay increases to a greater degree.[145] New pay arrangements have, for the most part, yet to materialise. When we received evidence a new Pay and Effectiveness Agreement for industrial employees had been signed at Cardiff and accepted by staff at Burghfield but similar deals had been rejected at the other two sites. Non-industrial employees at all sites voted to accept a two year package consisting of a 2.8 per cent pay increase with up to 2.5 per cent

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[137]Evidence, p 28, A27

[138]Evidence, p 27, A21

[139]Second Report, HC 297 of Session 1993-94, para 58

[140]Evidence, p 26, A16a

[141]Evidence, p 26, A16c

[142]Evidence, p 26, A16a; this figure had improved by the time we took oral evidence

[143]Q1559

[144]*ibid*

[145]Second Report, HC 297 of Session 1993-94, para 61

performance pay on top.[146] These arrangements supersede the normal civil service performance related pay conditions. We welcome the departure from normal civil service pay and conditions: the contractor is operating in a highly specialised field and must be allowed the flexibility to respond to prevailing market conditions. Without this freedom, there is a danger that AWE will simply not be able to fill existing vacancies and some aspects of the programme of work may suffer.

40. The concerns over future prospects expressed by AWE staff we reported last year were fully justified. The rationalisation announced in January is to involve 850 job losses in the period up to 1999: 350 at Cardiff, 300 at Burghfield and 200 at Foulness.[147] We were told that Hunting-BRAE are determined to minimise compulsory redundancy, but the numbers involved will depend upon factors still to be resolved such as the transfer of staff from site to site and the number of volunteers for redundancies.[148] In determining the details of the redundancy programme we expect the contractor to pay full regard to the current difficulties in recruiting in certain areas. The Compliance Office also should be given an opportunity to comment on the detailed proposals in order to ensure that AWE's capability is in no way jeopardised. **We look to MoD to see that the redundancy programme is carried out in such a way as to minimise current uncertainty and contribute to the repair of morale.**

[146]Evidence, p 26, A16b

[147]Evidence, p 28, A3

[148]*ibid*

LIST OF TERMS AND ABBREVIATIONS

AGEX	Above ground (non nuclear) experiments
AWE	Atomic Weapons Establishment
CTBT	Comprehensive Test Ban Treaty
DASO	Demonstration and shakedown operation
DML	Devonport Management Limited
GO-CO	Government-owned, contractor-operated
HSE	Health and Safety Executive
ISD	In-service date
ITT	Invitation to Tender
MoD	Ministry of Defence
SDE	Statement on the Defence Estimates
SMCS	Submarine Command System
SSBN	Nuclear-powered submarine armed with ballistic nuclear missiles
SSN	Nuclear-powered submarine
SWS	Strategic Weapon System
TWS	Tactical Weapon System
UK	United Kingdom
US	United States

PROCEEDINGS OF THE COMMITTEE RELATING TO THE REPORT

WEDNESDAY 5 JULY 1995

Members present:

Sir Nicholas Bonsor, in the Chair

Mr Michael Colvin	Mr Robert Key
Mr John Home Robertson	Mr Neville Trotter

The Committee deliberated.

Draft Report (Progress of the Trident Programme), proposed by the Chairman, brought up and read.

Ordered, That the draft Report be read a second time, paragraph by paragraph.

Paragraphs 1 to 40 read and agreed to.

Resolved, That the Report be the Eighth Report of the Committee to the House.

Several papers were ordered to be appended to the Minutes of Evidence.

Ordered, That the provisions of Standing Order No 116 (Select committees (reports)) be applied to the Report.

Ordered, That the Chairman do make the Report to the House.

[Adjourned till Wednesday 12 July at Ten o'clock.

LIST OF WITNESSES

LIST OF WRITTEN EVIDENCE

MINUTES OF EVIDENCE

TAKEN BEFORE THE DEFENCE COMMITTEE

WEDNESDAY 29 MARCH 1995

Asterisks in the Oral and Written Evidence denote that part or all of a question or answer thereto, or a passage of Evidence has not been reported, at the request of the Ministry of Defence and with the agreement of the Committee

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Members present:

Sir Nicholas Bonsor, in the Chair

Mr Menzies Campbell
Mr Churchill
Mr Michael Colvin
Mr Frank Cook
Mr John Home Robertson
Mr Robert Key
Mr John McWilliam
Mr Neville Trotter
Mr Peter Viggers

Examination of Witnesses

REAR ADMIRAL RICHARD IRWIN, Chief Strategic Systems Executive, DR DAVID GLUE, Director General (Nuclear), MR DAVID LEWIS, Director (Finance and Secretariat) Strategic Systems and Nuclear, and MR JONATHON THATCHER, Director of Nuclear Policy and Security, Ministry of Defence, examined.

Chairman

1413. Admiral, gentlemen, good morning. I think all your faces are familiar to us but perhaps for the record you could say who your team consists of?

(Rear Admiral Irwin) Good morning, Chairman. Thank you. Perhaps I should start by explaining that from April last year I subsumed the role of Deputy Controller (Nuclear) and relieved Mr Geoffrey Beavan, who you will recall appeared before you last year. At the same time my Director of Finance and Secretariat, Mr David Lewis, subsumed the similar role for the Nuclear side. Dr David Glue joined my staff as the Director General, Nuclear, including the work at Aldermaston, and you will recall that he briefed you at Aldermaston just before he left his job there last year. On the far right is Mr Jonathan Thatcher who appeared before you last year, the Director of the Nuclear Policy and Security.

1414. Thank you very much. For the record, you are Rear Admiral Richard Irwin. Can we start then by asking you for a brief overview of progress made on the programme since our last inquiry highlighting particularly any outstanding concerns or difficulties?

(Rear Admiral Irwin) Thank you. The Trident programme is going well. HMS *Vanguard* had a very successful first patrol, remaining undetected despite the heavy Russian submarine activity around the New Year reported in the press. She has completed her base maintenance period including a 15 day period docked on the shiplift. HMS *Victorious* was handed over by the contractor in January and is now well into Work Up and trials, on programme to deploy about the end of the year. *Vigilant and Vengeance* are also on programme. AWE is in the second year of contractorisation, is meeting the warhead programme and is continuing to underwrite in-service warheads. The Company has embarked on a wide range of developments including revised pay arrangements, an enhanced IT system and a safety development programme. As required by our contract, they commenced a review of safety in phase one of the contract and their ensuing programme has been so successful that they had anticipated all but one of the recommendations of the HSE review, and actions to meet these are either complete or well in hand. The one recommendation was that the MoD should agree to AWE being subject to NII licensing, and you will have heard that that has now been agreed. We aim, with NII approval, to achieve this in 1997, a compromise between dropping everything to complete the necessary paperwork and an extended programme. Inextricably entwined with the work to produce safety cases is the site rationalisation programme. With the Trident programme coming to its conclusion, we tasked AWE to match future capacity to future workload while retaining capability. They, as you know, are proposing to reduce the sites while retaining all capabilities. That is a good start but there is much further to go: I wish to see a rationalisation of Aldermaston itself and the decommissioning of all redundant facilities. I do not wish to see effort and money expended on facilities which are not required. I do wish to see Aldermaston as a modern, licensed site containing all the capabilities we require at the right capacity to match the workload of the next century.

1415. Thank you. Can we start off with a couple of general questions on costs. I note that the unallocated contingency has fallen by £68 million since last year. Can you say how that is accounted for?

(Rear Admiral Irwin) I think as soon as we get on to difficult finance I need to turn to my Director of Finance, Mr Lewis.

(Mr Lewis) Chairman, the unallocated contingency is that part of the total budget for the Trident programme which caters for those potential risks which are not attributable to individual components of the programme, such as the submarine itself or the strategic weapons system. It has been our practice consistently from the outset of the programme to keep that unallocated contingency under review each year. As the extent of potential remaining risks diminishes so we

[**Chairman** *Cont*]
reduce the unallocated contingency and it is in fact reduced somewhat this year by the amount that you mentioned, and indeed when expressed in percentage terms of remaining spend. So it is in that sense a diminishing percentage of an amount that is itself diminishing. It does reflect our objective, and we hope realistic, assessment of the degree of outstanding risk.

1416. Can you say why on allocating contingencies there is nothing against the tactical weapons system?

(Mr Lewis) In that particular area, Chairman, we have reserved no contingency because the view has been, and remains, that the cost, the eventual cost, of the tactical weapons systems is likely to be containable within that part of the Navy's share of the procurement budget which is dedicated to submarine equipments. I am aware that the Committee may find this slightly odd given that we have not yet quite achieved perfection with the tactical weapons system but, nevertheless, that again reflects our assessment of the degree of risk.

1417. Thank you very much. Can you tell the Committee whether you anticipate any further significant cost fluctuations in the next 12 months?

(Mr Lewis) We have pitched our estimate, Chairman, at a level which we believe reflects the reality. We do not, however, exclude the possibility of a cost fluctuation. There are some areas of the programme which for various reasons could increase in cost or equally decrease in cost. The estimate that you have before you reflects our best overall assessment.

1418. That partly answers my next question I think. Can you tell us what factors have brought down the estimated real costs of the submarine programme by £70 million? Are any further reductions anticipated in that or is that within the answer you have just given me?

(Mr Lewis) There are a variety of increases and decreases, Chairman, in that net estimated reduction of £70 million. We believe that all the time the estimate for the submarine component of the programme is hardening. If I can just list some of the variations since last year. We have seen increases in the areas of design agency services. We have been making greater use than we anticipated of the design agency contract. That increases, in gross terms, the estimate by some £12 million. An increase of £8 million is attributable to work on SSBN O5, HMS *Vanguard*. That reflected increased exclusion work, that is to say work not covered by the contract, together with a revision of company overheads like VSEL. There were also some increased costs amounting to £3 million arising from so-called first of class costs. This is a kind of retrospective annual review of costs where the company, by agreement with the Ministry of Defence, recovers elements of certain retention payments. Decreases, Chairman, if I may, the estimated cost of the final two submarines has reduced quite significantly by some £40 million. As we advance, as I was saying just now, we have also adjusted the contingency and in the submarine area we have reduced that by £25 million. Following an increase which we notified last year in the areas of support and spares, I am glad to report now that we believe there will be a modest reduction on that of some £14 million. That arises from a ranging and scaling exercise, as we call it. There are some complicated receipts which we expect to receive arising from the 1966 Finance Act to do with VAT which I can explain if you wish. That gives us a saving of a further £9 million. Finally, Chairman, we have discovered that buried in the estimate we have been including certain costs which are not strictly speaking acquisition costs but are really running costs and that accounts for a reduction of £9 million. All of that, Chairman, gives us a net reduced estimate of £70 million.

1419. Thank you very much, Mr Lewis. I think I will spare the Committee a detailed explanation for the VAT changes! Can I turn back then to the boats themselves, Admiral. You have told the Committee that HMS *Vanguard's* test firings were successful. I believe there was some damage sustained. Can you tell us what that was and how much it cost to have it put right in the US?

(Rear Admiral Irwin) I am trying to think what damage you are referring to?

1420. There was an answer given to us in a letter where we asked about damage to the steering system—which there was not—but there was, however, some minor damage to the submarine's propulsor. Perhaps you could say something about that and particularly the cost of it?

(Rear Admiral Irwin) Going up the river to Kings Bay the submarine made a manoeuvre which caused part of the stub cable in the towed array to be ingested through the propulsor which caused some nicks to the propulsor. As regards power transmission into water that was totally unimportant but as regards noise it was extremely important and we had to do some work to pare down the shape of the propulsor.

1421. Any idea of the cost of that or is that something you cannot tell us?

(Rear Admiral Irwin) Sufficiently minor but no I do not have it. It would not have been even approaching hundreds of thousands of pounds.

1422. In so far as the array getting sucked in, is that a design fault or what was the cause of that?

(Rear Admiral Irwin) It is one of the difficulties of carrying a towed array behind you that if you have to make a manoeuvre like going astern then you are in danger of ingesting it. Ideally the submarine is not put in a position where it has to go astern but going up a narrow winding river with other traffic it is not possible to guarantee that does not happen.

Mr McWilliam

1423. Given that you have had to change the profile slightly of the propulsor has that had any effect on performance at all?

(Rear Admiral Irwin) Not at all.

1424. And no effect on noise?

(Rear Admiral Irwin) No. If we had had to make major changes then of course there would have but they were very small.

1425. Why was the towed array cable not secured when it was going up river? Surely there would not be

[**Mr McWilliam** *Cont*]
any need to deploy it at all in a river?

(Rear Admiral Irwin) The towed array itself was not deployed. It was the little tiny bit that hangs out at the stern that unfortunately was still hanging out when the submarine went astern.

1426. Is there some way of securing that in those circumstances?

(Rear Admiral Irwin) That is one of the problems that we are still having with Sonar 2054.

Chairman

1427. Can we look at HMS *Victorious*. I think you have already told the Committee that her trials have also been successful. Can you say whether the current trials that are going on are likely to continue so that you can bring her into service on the assumed date?

(Rear Admiral Irwin) The trials package for *Victorious* is considerably less than that for *Vanguard* because *Vanguard* had to do all the first of class whereas *Victorious* is only having to test her own equivalent which we already know as a type works. So only a small part of the time she is spending at the moment is on trials, a large part of it is on working her crew up. Although I cannot have total confidence that all the trials will go successfully, I do have very high confidence—much higher than I would have had at this stage with *Vanguard*—and I am as confident as I can be that she will be ready to deploy on time.

Mr Campbell

1428. Can you tell us what the latest estimate is of the in service date for the latter of these two?

(Rear Admiral Irwin) Around the turn of the century is as far as I am able to go[1].

1429. At that point are we to take it that they will—forgive me if I do not put this very elegantly—be fully equipped in the sense that they will have the full range of missiles and warheads available to them?

(Rear Admiral Irwin) Yes.

1430. That will include, I take it, the sub-strategic capacity about which we have had evidence to this Committee on previous occasions?

(Rear Admiral Irwin) Yes, it will.

1431. The most recent estimate that we have had is that the WE177 is likely to remain in service until the year 2007. On the account you have given does that mean that there will be, let us say, approximately a seven year overlap in sub-strategic capability as between the Trident submarines and the WE177?

(Rear Admiral Irwin) The Trident submarines will have the sub-strategic capability from the time that HMS *Victorious* deploys and that will be a stronger capability when *Vigilant* is also deployed.

1432. Can you tell us, again, by way of estimate, when you think *Victorious* will be—to use my somewhat infelicitous phrase—fully equipped?

(Rear Admiral Irwin) Around the end of this year.

[1] This answer arises from a misunderstanding; HMS *Victorious* is scheduled to enter service at around the turn of the year (see Q1432) and *Vengeance* at around the turn of the century.

1433. So the overlap then would be approximately from 1996 to 2007?

(Mr Thatcher) I think I would just like to clarify that the point we have emphasised in the past was the potential for WE177 to remain in service until 2007[2]. I think it has been said recently by Ministers that the weapon was expected to continue to contribute to our capability for a number of years without being specific.

Chairman

1434. In other words, if we found that we had more than we needed at a specific time we could phase out WE177 early?

(Mr Thatcher) Certainly, that would be a possibility.

Mr Campbell

1435. I know it is a possibility but I want to know if it is within contemplation? How far has the thinking along those lines proceeded, can you tell us?

(Mr Thatcher) I think I can say that the thinking on those lines has proceeded quite a long way but that I am not in a position to say what its final conclusion is.

Mr Campbell: Very well, that may be as good as we are going to get.

Chairman: I think you will have to contain your patience until you get your hands on the Minister.

Mr Campbell

1436. We had that yesterday but it produced rather more heat than light, I think. Can I ask you then about this: you have told us in written information provided in advance of today that it is expected that two SSBNs will remain in the patrol cycle at all times during the transition from Polaris to Trident. Have any arrangements been made for coping with anything unexpected that might happen? For example, is one of the Polaris boats going to be kept in reserve against that possibility?

(Rear Admiral Irwin) There will always be two submarines once *Victorious* deploys. It is our intention to pay off the last of the Polaris submarines before the third Trident submarine comes into service.

1437. You gave us an estimate about *Vengeance*, can you give us an estimate about *Vigilant*?

(Rear Admiral Irwin) In 1998.

1438. In 1998, the intention is to pay off the last of the Polaris submarines by 1998 if that be the date upon which *Vigilant* comes into service?

(Rear Admiral Irwin) Yes.

1439. It has been represented to us that *Renown* has not patrolled since June 1994, can you comment on that and tell us what her state of health is?

(Rear Admiral Irwin) That is correct. *Renown* has a defect and she is in the Clyde Submarine Base at Faslane where they are working on the defect.

1440. What is the nature of the defect?

(Rear Admiral Irwin) It is to do with her propulsion system.

[2] The witness has subsequently noted that the first sentence of his answer understates the extent to which some earlier public statements reflected an assumption of the weapon remaining in service until the years of the next century, although other statements had indicated only the potential for the weapon remaining in service.

[**Mr Campbell** *Cont*]

1441. Can you be more specific than that?

(Rear Admiral Irwin) No, I would rather not.

Chairman

1442. Can you give us a time estimate on when it may be put right?

(Rear Admiral Irwin) It is an area in which I do not have a lot of expertise. I would rather not commit somebody else to an answer that they might not be able to achieve.

1443. Perhaps you could get somebody to let the Committee have a note in writing, classified if you wish.

(Rear Admiral Irwin) Certainly.

Mr Campbell

1444. What consequences, if any, have there been for the patrol cycle as a result of what you have just told us?

(Rear Admiral Irwin) The reason that we like to have three submarines in the operational cycle is that we acknowledge that there might at any stage be a problem with one. We are in that situation right now. The other two submarines are having to work that much harder to maintain the unbroken deterrent patrols.

1445. Have we maintained the unbroken patrols?

(Rear Admiral Irwin) Yes, we have.

Mr Campbell: Thank you.

Mr Churchill

1446. Is there any read across with that defect with any of the other Polaris boats?

(Rear Admiral Irwin) We have good confidence that there is not but it is not absolutely possible to put one's hand on one's heart at this stage and say that there is not. We have high hopes that there is not.

Mr Trotter

1447. Is *Renown* going to be the next one to be disposed of?

(Rear Admiral Irwin) Not necessarily. It depends on how the repair goes.

Chairman

1448. Presumably if it was, and you were certain that it was, you would not waste money repairing her?

(Rear Admiral Irwin) Indeed.

Mr Trotter

1449. We heard last year that single crewing was being looked at, could you bring us up to date on the situation there?

(Rear Admiral Irwin) Regrettably there is not very much more to add than last year. We have not yet had enough experience of operating the submarines to take a view. There are many ideas being tried, including a single augmented crew as a concept, but no decisions have been taken. We will tell this Committee as soon as a decision is taken, which probably will not be until *Vigilant* is in service.

1450. Is the ratio of sea to shore 50/50 roughly in the normal life of one of these boats?

(Rear Admiral Irwin) Once the submarine becomes operational, yes. In fact, if anything it is more at sea, it is about 60/40.

1451. Is there any precedent for this in the US Navy? Have they gone down a similar line?

(Rear Admiral Irwin) No, they have not gone for single crewing. Their submarines are not working as hard now as they were a few years ago.

1452. So it is something that is being contemplated and perhaps you can advise us in due course of the outcome?

(Rear Admiral Irwin) We certainly will but it will not be for some years.

1453. Not until you have built up the operational practice with the new boats.

(Rear Admiral Irwin) We first of all need to have three boats in the cycle and then we need to see how we get on with three boats.

1454. Of course, one of the problems presumably is that you could not quickly augment those crews owing to the speciality of the work?

(Rear Admiral Irwin) That is one of the problems that we have to solve by having nominated billets elsewhere where you could bring people in to augment the crews.

Chairman: Can we now move on to SWS.

Mr Home Robertson

1455. It has been reported that the cost of D-5 missiles has decreased I think by £26 million since last year. How much of that is due to exchange rate fluctuations and what other factors are there in that calculation?

(Rear Admiral Irwin) You are opening quite a complicated box.

1456. That is the whole idea!

(Rear Admiral Irwin) I would like my Director of Finance to answer.

(Mr Lewis) The answer to your question about the extent to which that reduction is due to exchange rate variation is that more than that reduction is due to exchange rate variation. In fact, that accounts for a reduction of about £55 million but there are increases which offset that and bring that down to a net reduction of the £26 million that you mentioned. Briefly, if I may, we have seen increases of £27 million on our share of incentive fees. At this stage you might be surprised at the timing of that. The explanation is that these are fees paid to the contractor not during the manufacture of the missile but after delivery and upon, as it were, customer satisfaction. We have seen an increase of £12 million arising from the American revision of our estimated future costs and on top of that a further £11 million arising from changes in the estimated costs of the missiles. The reductions: I have mentioned already the one arising from exchange rate variation, there is another reduction of £20 million resulting from a reduction in the number of guidance parts that we will need. This is geared to the number of guidance sets. All of that should produce a net saving of £26 million.

[**Mr Home Robertson** *Cont*]

1457. Thank you. I think it would be very useful to the Committee if you could perhaps let us have a paper summarising this because it is obviously quite a complicated story. It sounds as though but for the exchange rate fluctuations there could have been a very substantial increase in the cost of these missiles?

(Mr Lewis) The increase in the cost of the missiles, yes, would have been somewhere between £25 million and £30 million in the absence of favourable movement of the exchange rate, but whether one describes that as significant in the context of a total SWS bill of something like £1.2 billion is a moot point. I would be very glad to let you have a note of those changes.

1458. That would be appreciated, thank you. What is your latest information on the United States Navy's procurement programme for D-5 missiles? Can you comment on recent reports that unit costs of the D-5 missile are going to increase as the number of missiles produced actually declines?

(Mr Lewis) There is some possibility of that happening. I think that speculative articles have appeared in the press which suggest that mind-bendingly large increases are in the pipeline. I can assure the Committee that is not the case, those articles were purely speculative. It is the case, following the American's Nuclear Posture Review, which they completed late last year, that their thinking has moved on since the Committee last addressed this matter. I think last year our concern, which the Committee in its report echoed, was that there might be a possibility of American production being cut because of moves that were afoot in Congress. Since then, of course, we have had the mid-term elections. We have also had the outcome of the DoD's Nuclear Posture Review. The elections, I think, perhaps changed the view taken on the programme by Congress and certainly the Nuclear Posture Review has persuaded, I think it is fair to say, the Department of Defense that they should plan to continue with production well into the next century. This does have the effect of spreading out production in the way that you have said. Certainly it is possible that that could have the effect of increasing unit production costs somewhat. The American defence budget, like our own, like all Federal spending, is under pressure and they are as anxious as we are to contain the costs and we are looking very closely with them at ways of doing that right now.

1459. Could you accelerate the rate of purchase in order to avoid increases in costs in future years if necessary?

(Mr Lewis) That is a possibility that we do keep under review but there are disadvantages to that. Missiles have a life expectancy: the sooner we buy them, the sooner we will have to relinquish them. The purchase of missiles is geared to the requirements to outload the individual submarines. Also, of course, if you bought forward what would be a substantial slab of the expenditure you would have to manipulate the rest of the defence programme in ways that possibly might not suit us.

1460. What is the life expectancy, since you raise it?

(Rear Admiral Irwin) Twenty years, but the US are thinking that they may be able to extend that by quite a long way. That is based on Trident 1 experience.

1461. You have referred to press speculation and press reports, can you comment on recent press reports that the United States' Government may be now rather less willing to supply these missiles to the UK than they once were?

(Rear Admiral Irwin) That is total press speculation. I have every indication to the contrary.

1462. You hope?

(Rear Admiral Irwin) I have every indication to the contrary.

1463. How firm are the current plans under which we understand that you intend to purchase seven missiles annually between 1997–1999?

(Mr Lewis) There have been a number of statements, there was one in particular which appeared in one of the Defense Department's House Journals in the United States.

1464. Yes.

(Mr Lewis) In which the Deputy Secretary for Defense was quoted as mentioning a figure of that sort. I think on that particular occasion the subject under discussion was the United States' programme and in that context it was natural enough, I think, for the Deputy Defense Secretary to make some reference to the planning which had been going on. Those were, however, only very provisional figures and Ministers have not yet taken a decision on the size and timing of future UK orders and that remains the case.

1465. Is it your intention to publish those figures when decisions have been made?

(Mr Lewis) Certainly it has been our practice in the past to announce those when contracts are placed, yes.

1466. Does the total requirement remain unchanged?

(Mr Lewis) Our planning has not changed since last year.

1467. Can I go back briefly, Chairman, if I may, to a subject which was touched on last year, the subject of the numbers of warheads. We know the potential to deploy nuclear warheads in the British deterrence fleet is increasing from 48 to 96. Can you yet say whether the explosives fire power deployed on Trident boats will be identical to that deployed on Polaris while it is on patrol?

(Mr Thatcher) I do not think we would want to say more than was said previously which is that they would be broadly comparable.

1468. We are at a time now when we are trying to discourage other countries from nuclear proliferation. Can I put it to you that you have actually apparently increased Britain's nuclear fire power above what was deployed in the Cold War? I hope you are going to deny that but it would be helpful if you said something?

(Rear Admiral Irwin) The Secretary of State made a statement yesterday which it might be worth repeating.

Mr Churchill: We were there.

Mr Campbell

1469. He was in an uncomplimentary mood.

[**Mr Campbell** *Cont*]

(Mr Thatcher) The Defence Secretary did make a statement saying that when Trident takes over the sub-strategic role in the next few years and the WE177 is withdrawn the UK will have 21 per cent fewer nuclear warheads than it did in the 1970s and that the total explosive power of those warheads will be some 59 per cent lower than the 1970s figure.

(Rear Admiral Irwin) I think you would not expect us to go beyond what the Secretary of State has said to us.

1470. I appreciate that. It is a pity that neither he nor you can do what President Mitterand has done and publish the total number of nuclear weapons and warheads that are available. Can you tell us what has been deployed on *Vanguard's* first patrol?

(Rear Admiral Irwin) No more than 96 warheads.

1471. In other words, potentially rather more. Could the United Kingdom nuclear weapons be included in negotiations for a START 3 Treaty? Is there any technical reason why we should not be able to deploy less missiles and less warheads?

(Rear Admiral Irwin) The Government has consistently maintained a minimum deterrent and at each stage when it has been possible to do so it has not only reduced the number of warheads but demonstrated it has. The Secretary of State announced, for instance, that we were reducing the maximum number we might carry from 192 to 96, and that was a significant reduction. When you field the minimum deterrent it is very difficult to do anything to make it any less minimum.

1472. You have increased it. Is there anything to stop you operating these boats with less than their full complement of missiles and warheads?

(Mr Thatcher) From a technical point of view there is no reason why they cannot operate with whatever number of missiles and whatever number of warheads within a total capacity of the system that we choose.

Mr Campbell

1473. I wonder if I might ask a question related to your reference to what the Secretary of State said yesterday, because it was in reply to a question from me that he said so in the House. When we are making these comparisons between what we have had previously and what we are likely to have, can we leave out the fact that the warheads on Trident are capable of being independently targeted and its range is approximately twice that of Polaris which it is to replace? Are not both of these factors to be taken into account in any comparison?

(Rear Admiral Irwin) Can I take range. That is very important to sub-mariners, not because you can deliver weapons to a greater distance into other people's territory but because you can stand off very much further and therefore have much more sea room in which to remain undetected. So I see that from a rather different perspective from you.

1474. It is an enhancement of the capability if you can fire it from a further distance away, is it not?

(Rear Admiral Irwin) It is an enhancement of the capability of the submarine, yes.

1475. Should we not take account of the capability of independent targeting of warheads which Trident provides as compared with Polaris, which it is to replace, when we are making comparisons of this kind?

(Mr Thatcher) I think the fundamental point, which I think we said last year, was that the capability that we are going actually to deploy and which we have not disclosed is no more than what we judge in the light of all the aspects of the system to be the minimum needed to provide the deterrent. Clearly there are other aspects to that than the number of warheads or the yield of warheads. Nonetheless, in arms control terms, numbers of warheads are clearly a currency that is used. It is also the case that the US Government has disclosed some figures on the total explosive power of its inventory. They are not—and we have not, I hope, ever suggested that they were—the final yardstick in every respect.

Mr Cook

1476. I am interested, Admiral, in the point you make about the Government's consistency in establishing a minimum nuclear deterrent. It is a very nice argument to say you cannot reduce minimum on minimum. I would ask you on what basis you establish a minimum to do what? How many times do you want to destroy the world?

(Rear Admiral Irwin) The Government has decided what is its criterion for a deterrent and, having decided that, the military task is to demonstrate that we can achieve that criterion.

1477. On what basis?

(Rear Admiral Irwin) I cannot go into the Government decision.

Chairman: I do not think this is a question for the Admiral, it is a political question.

Mr Cook: I was just wondering where the threat was coming from, Chairman.

Chairman: I will tell you, Frank, when we are having a private moment.

Mr Cook: Now I know I cannot ask whatever questions I wish—

Chairman: You have to stay within the limits of what the witnesses can answer.

Mr Cook

1478. Chairman, with the utmost respect, I thought I was. Can I return to unit costs please. We had an interesting discussion and I want to establish one point. Is the unit cost to the UK Government the same as the unit cost to the US Government?

(Rear Admiral Irwin) Yes, it is.

Mr McWilliam

1479. I just want to clarify, you said that Trident minus WE177 represents a 21 per cent cut, is that correct?

(Mr Thatcher) Compared to the 1970s.

1480. Is that all the WE177s, naval and air force?

(Mr Thatcher) For the 1970s figure, yes.

Mr Colvin

1481. In the written answers which you gave us you said that all elements of the tactical weapons system

[**Mr Colvin** *Cont*]
have been fully tested but there were still some problems with the sonar suite. Can you elaborate on that, what problems were they?

(Rear Admiral Irwin) I will start with the one that we have already touched on which is the towed array handling system which is unreliable. We have had, therefore, to dispense with its use for the moment and we attach the towed array manually rather than pulling it back on to a reel on the submarine. It is not a limiting problem because we are able to do that. When the submarine deploys it has the towed array on but it is a thorough nuisance. It takes time and it is something that we must overcome.

1482. How long will it take you to overcome it?

(Rear Admiral Irwin) The programme, which is an optimistic programme so I would not wish to be held too closely to it, is to complete that by the end of this year.

1483. Does it impose any operational limitations on *Vanguard? Vanguard* is operationally deployed.

(Rear Admiral Irwin) Only in that *Vanguard* has to stop to put the array on before she deploys on patrol and vice versa.

Chairman

1484. I am a little puzzled as to how we managed to find so many problems with that given that it is a standard method on a lot of these ships as well as on these boats? Why do we have problems which do not arise, for example, with sonar arrays carried by frigates?

(Rear Admiral Irwin) A frigate is a very much easier platform on which to put a towed array. The handling system for *Vanguard* had been trialled extensively from the back of a surface ship and we had, we thought, high confidence when it went to sea, but with the flexure of the submarine hull going up and down, going down to depth and back up again, there were changes in the relative position of parts of the array which were such that the system of pulling the towed array in and winding it round the drum went wrong and we were getting snarl ups on the drum.

1485. Does this differ in any way from the sonar array being towed by an SSN?

(Rear Admiral Irwin) They do not attempt to pull it back into the submarine, they clip it on in a way that we are now having to do with *Vanguard*.

1486. Why was it not trialled on SSNs rather than waiting for *Vanguard* to do it?

(Rear Admiral Irwin) It is a very big fit. This array is many hundreds of yards long and of some diameter and it takes a very big drum to put it on. It is not just something you can fit to a submarine without making changes.

1487. Do I take it that this is something the Americans do not do or could we not have learned lessons from the American experience?

(Rear Admiral Irwin) They do but to a different system.

Chairman: I see. Thank you very much.

Mr Churchill

1488. This is a UK design?

(Rear Admiral Irwin) Yes.

Mr Colvin

1489. Can I move on to the SMCS software because there have been some delays in the software development programme. I wonder if you could elaborate on the answer that you gave us and tell us about any consequential practical difficulties and what the complications of those delays are?

(Rear Admiral Irwin) Vanguard went to sea with a command system which was adequate to her need but reliability was poor. That meant that there were back up hand systems to recover data from if the command system crashed. We have had another issue of software now which is being tried in *Victorious* and has now been installed in *Vanguard*, although she has not yet been to sea with it, which does two things: first of all it instals a back-up system so that the data is held and if the system fails the data can be recovered automatically; and, secondly, it overcomes many of the reliability problems. So, although we have not got there yet, because we have a very demanding reliability criterion to achieve, we are well on the road and the system is now such that the submarine will be able to use it relatively easily.

1490. You are on target for finally resolving these problems by mid-1995?

(Rear Admiral Irwin) Achieving the very high reliability criteria we set ourselves will probably take longer than that, but getting to a state where the submarines are totally happy with it we are there.

Mr Colvin: Can I just ask a question about the Tomahawk. Why was there a flurry of press reporting yesterday on what was a fairly old story? Are newspapers running out of news?

Chairman

1491. Wrong target now!

(Rear Admiral Irwin) I do not know. I thought it was rather an interesting story.

Mr Colvin

1492. There was nothing new in it, was there?

(Rear Admiral Irwin) It is complementary to a sub-strategic nuclear capability.

1493. That was really just a lead in to ask you whether you could put Tomahawk on the SSBNs in the torpedo tubes or would that mean adding very expensive command systems or modifying the present command system?

(Rear Admiral Irwin) It would mean adding a fire control system which would cost money, but not a lot of money. It would also mean giving a very difficult role to the submarine: remaining totally undetected for its strategic role; being able to perform a sub-strategic role; being able to engage the enemy more closely for a Tomahawk role. It is possible, but it is not at the moment being discussed and I do not know of any plans to do anything about it.

1494. The Tomahawk can of course carry nuclear warheads?

[**Mr Colvin** *Cont*]

(Rear Admiral Irwin) The American one can. I should point out that it takes years to develop a warhead for something. There is no possibility of our putting a nuclear warhead on Tomahawk in the foreseeable future.

Chairman

1495. Can you tell us what range the Tomahawk has?

(Rear Admiral Irwin) I am afraid I am way off my patch, Chairman, so, no I cannot.

Chairman: Perhaps you can get somebody to drop us a note. Thank you. Can we move on to testing.

Mr Viggers

1496. What is the MoD view on the degree of testing/experimentation that should be permitted under a Comprehensive Test Ban Treaty?

(Rear Admiral Irwin) I do not know that the MoD has actually formulated a view yet, has it, Jonathan?

(Mr Thatcher) We have not made any formal statement beyond the fact that we clearly do need to develop further the experimental techniques that we have been using in the past and the computational techniques. A statement was made at the Conference on Disarmament fairly recently to underline the point that we are still studying how best to meet the responsibility of responsible stewardship of nuclear weapons in the absence of nuclear testing, in other words under the CTBT.

1497. You have non-nuclear tests and computer simulations but at what point would you consider that a nuclear test is necessary to guarantee the reliability of a weapon?

(Mr Thatcher) We have not come to a final judgment on that.

1498. So do you have a view as to whether US consent should be sought for a single nuclear test before September 1996, as has been mooted?

(Mr Thatcher) We have not got any plans to undertake nuclear testing in the full sense of that word while the American moratorium remains in place, and of course the Americans have said that they have extended their moratorium through to then.

1499. Do you feel a need to test the sub-strategic warhead?

(Mr Thatcher) No.

1500. You are satisfied that your existing tests, other than nuclear tests, will give you the level of safety and certainty that you require?

(Rear Admiral Irwin) Yes.

1501. Admiral, I do not know if the *San Jose California Mercury News* is on your reading list.

(Rear Admiral Irwin) It is not.

1502. There was a report, which has been put to the Committee, that if the nuclear warhead were to be subjected to seawater flooding this could lead to risk and possible explosion, possible radiological explosion.

(Rear Admiral Irwin) That would, of course, be talking about the US nuclear warhead.

1503. Yes. It is a story about a former Lockheed employee saying that there was a danger that: "Under certain operational conditions, it is possible the (missile) launching tube and the primary (section) of the Polaris missile warhead may be flooded with seawater." It is suggested that similar risks attach to current D-5 weapons. Can you comment on that?

(Rear Admiral Irwin) I think from what you are saying that you are talking about the ability for a small quantity of water to get into the tube which can happen when you are raising the muzzle hatch under some circumstances. If this small quantity gets into the equipment section, which is underneath the warheads, we call the missile "flooded" because it needs to go back to be overhauled. That is actually a very small quantity of water inside the equipment section, we are not talking about a tube full of water.

1504. If a small amount of water can cause a problem——

(Rear Admiral Irwin) That is a corrosion problem for the metal of the equipment section. It is a reliability problem.

1505. So you are satisfied that sufficient testing has been done that seawater corrosion would not cause a hazard?

(Rear Admiral Irwin) In the case of a warhead in a submarine I am absolutely certain of that, yes.

Mr McWilliam

1506. Were you aware of the American Stardust test?

(Dr Glue) No.

1507. I am not surprised because no results were ever released from it. Would a quantity of plutonium or uranium immersed in seawater have a tendency to go super-critical?

(Dr Glue) Clearly a sample of those materials immersed will be subjected to accelerated degradation and that situation is known and well understood. With the situation we have as far as the warheads that we have designed and developed, we are confident that the situation you indicate will not arise.

1508. Were you aware that at the end of the second world war one of the concerns was what would happen if the super fortress went into the sea with bombs on board? There was a thought that there was at least a possibility of a fission and radiation release if that had happened.

(Dr Glue) I repeat for the systems that we have designed we are confident that that situation will not arise.

Mr McWilliam: So we have got nothing to worry about from the nuclear warheads in that Russian submarine that is under the Bering Strait at the moment?

Chairman: That does not follow, if I may say so, Mr McWilliam, when we are talking about this system.

Mr McWilliam

1509. I am talking about the physical nature of plutonium and uranium and what happens to it in

[**Mr McWilliam** *Cont*]
quantity when it is immersed in sea water. Now what Dr Glue is suggesting is that there are no circumstances where that could happen to any of our warheads. What I am suggesting to him is that the probability is low but it is not zero.

(Dr Glue) We are confident in the tests we have carried out on our designs.

Mr Viggers

1510. In the absence of nuclear tests have you been developing additional resources for above ground non nuclear experimental facilities?

(Rear Admiral Irwin) Yes, we have.

1511. Can you say what you have done and spent on it?

(Dr Glue) The above ground experimental techniques fall roughly into three areas. Computation, enhanced computational capabilities and the necessary codes that we use to understand the function of the warheads. Secondly, the use of lasers to simulate some conditions that we understand go on inside a warhead. Thirdly, the use of radiographic facilities, not that dissimilar to what one might see from a conventional X-ray in a hospital but very significant high power in order to look through a device when it simulates going critical or super-critical. Those three basic techniques are in existence at AWE. We are in the process of enhancing our capability in each of those three areas. Those three techniques that we have, Mr Chairman, are available at AWE. We are, as part of our AGEX enhancement programme, extending our understanding of the capability. We are spending additional money and additional resource to develop those techniques further in order to provide the capability we require in the absence of underground testing.

1512. Do the Americans have similar resources and do the French have similar resources to test weapons?

(Dr Glue) Yes, Chairman, they do. Both the French, from my understanding, and the United States have those three basic techniques, there are other techniques but basically those three techniques. We continue to have discussions with our colleagues in order to advance our understanding.

1513. Are we able to offer facilities to the French and Americans to use our facilities and charge for them perhaps?

(Dr Glue) In terms of our collaboration under the 1958 Agreement, we have a number of exchanges with the United States which do involve use of facilities both in the United States and in the United Kingdom. Our involvement with the French has been going for a much shorter period. We continue to develop that understanding. We are in the early stages of establishing where each other is coming from, understanding each other's techniques, if not trying to master a common language. I think it is too early to say where that experience is going, certainly the channels that we have available for the French have been used since we reported last year to this Committee.

1514. Are we effectively duplicating resources in other countries?

(Dr Glue) I do not think it is a matter of duplicating, I think it is complementing. It is a technically difficult area, trying to simulate the extreme conditions that a nuclear weapon goes through in its critical and super-critical phases. The best technique to do that is underground testing. That is not available to us and I think our development in collaboration with the United States is of a complementary nature rather than duplicating. It is fair to say, of course, we are establishing facilities which are very similar. We tend to try and integrate as much as we are able to.

Mr Cook

1515. If it is possible for me to be reassured by anything related to weapons of mass destruction I suppose I have been most reassured by your expressions of confidence in and satisfaction with the computational techniques that you apply. I think that is good news in my book. Does that mean that if the moratorium were lifted in the States you would not seek to have the field testing?

(Rear Admiral Irwin) No, I think if the moratorium were lifted and the United States started testing again we would wish to test as well because as we discussed last year the only way that a nuclear physicist really knows that what he is doing is correct is by carrying out an experiment to prove it. It is how we keep their feet to the fire.

1516. So you are not as happy with the computational techniques as perhaps you might have led us to believe?

(Rear Admiral Irwin) I was careful not to lead you to believe that I was totally happy with the computational techniques. What we are doing is making the best of the situation in which we find ourselves.

1517. I wanted to know how far I had to go in the future.

(Dr Glue) Could I just add, Mr Chairman, we are obviously developing the best practical techniques that we can, just to reinforce what the Admiral has said, our best is currently not good enough to cover those situations which we see from an underground test, but there is a progressive development. There are no guarantees in above ground experimentation and we need to do better than we can at the moment but we are moving forward.

Mr Home Robertson

1518. There seems now to be a prospect that there will be a Comprehensive Test Ban Treaty by the time the American moratorium comes to an end. I understand that in the draft Treaty Britain is insisting on a clause to retain the right to test in "exceptional circumstances". Does that mean the ability to conduct full scale explosive tests or could it be covered by a smaller scale hydro nuclear—or whatever the term is—laboratory test?

(Mr Thatcher) The particular wording that is in the rolling text of the Treaty at the moment was envisaged, I believe, as intending full scale or essentially the old form of nuclear tests as they had been undertaken in the past. The statement that we made in the Conference of Disarmament recently underlined the point that while we continue to study how best to meet our future

[**Mr Home Robertson** *Cont*]
requirement we wanted to retain the option represented by that wording in the text.

1519. I was afraid that would be the case. What would be the impact of a genuine Comprehensive Test Ban Treaty on Britain's nuclear weapons programme?
(Mr Thatcher) I am not entirely sure that I am going to put the right gloss on your word "genuine".

1520. We do not want a gloss.
(Mr Thatcher) Chairman, if by that you mean a Comprehensive Test Ban Treaty as a consequence of which no activity was allowed which produced any fission yield whatsoever that would clearly be a very severe limitation.

1521. On us and indeed on other people?
(Mr Thatcher) Indeed.

Mr Trotter

1522. Does it follow from that that you are saying that some of these tests do require a very, very small nuclear reaction?
(Rear Admiral Irwin) If we are able to have a small nuclear reaction then we can do tests at that level which are very useful.

1523. So a very small reaction would be a very big step in your satisfaction as to capability?
(Rear Admiral Irwin) Yes, it would.

1524. Can you give us any idea about the amount of money that is being spent on simulation? The reason I ask that is there have been press accounts—we all know those are not necessarily accurate—that there is enormous spending going on in France in this direction?
(Rear Admiral Irwin) I do not know how much money the French are spending.
(Mr Lewis) I am afraid in the first place I do not precisely know the answer and, in the second place, I regret to say, Chairman, it has consistently been the practice of ministers not to reveal the costs of the constituent elements of our nuclear programme.

1525. Could you say whether it is a great deal less expensive than would be the actual tests?
(Rear Admiral Irwin) It is of the same order of magnitude.
Chairman: I think we will seek more detail by classified written evidence. Thank you. Could we move on to works.

Mr Key

1526. Please could we start by looking at the cost of dockyard projects. I would be grateful if you could explain the £48 million increase in real costs for the programme for 1993–94. What happened?
(Mr Lewis) The increase in cost is primarily due to the fact that we have reviewed the extent to which the cost of the nuclear refitting facility at Devonport should be attributed to Trident. We previously took our view on this from that which had obtained at the time that we were proposing to refit the *Vanguard* class at Rosyth but we have, in the last year, acknowledged that in terms of the element of the cost of the work at Devonport that arises solely from its use as a refitting venue for the *Vanguard* class that we should take more of that cost, which itself has not gone up, as being attributable to the Trident programme. That accounts for virtually the whole of the ostensible £48 million increase in cost.

1527. Is that why the contingency for 1994–95 has increased by £5 million at a time when we might expect the contingency to go down in line with the other drop in contingency?
(Mr Lewis) It is for precisely that reason, Mr Key.

1528. Excellent. Could we look at Faslane in particular now. I would be grateful if you could tell us the state of the shiplift at Faslane and what has delayed the granting of the full safety case there?
(Rear Admiral Irwin) The shiplift is operational but we only have limited clearance to use it until we have completed the full through life safety case. That is a very demanding and challenging safety case since we have to meet a high seismic criteria. We have concentrated the paperwork efforts, and they are paperwork efforts, on enabling the lift of HMS *Vanguard*.

Mr Cook

1529. Could you say that again, please?
(Rear Admiral Irwin) We are concentrating the paperwork efforts on getting clearance to lift *Vanguard*. We have achieved that and now we are concentrating the paperwork efforts on the through life safety case for the shiplift.

1530. So if you need to take *Vanguard* out you can do it?
(Rear Admiral Irwin) We can make a limited number of lifts this year without seeking further safety justification.

Mr Key

1531. What has happened to the handover of the crane next to the shiplift?
(Rear Admiral Irwin) On 12 Berth?

1532. Yes.
(Rear Admiral Irwin) That was not scheduled for handing over for some little while but the Commodore at Clyde wishes to move his usage of the berths to accommodate the minesweepers that are moving across there and has asked us to make that berth available rather more quickly. We are therefore rushing through the safety case for that.

1533. That safety case has not yet been approved?
(Rear Admiral Irwin) It has not yet been approved. It has been made and it is with the safety authorities at the moment.

1534. So what would happen in the case of an emergency, would you be able to use the shiplift?
(Rear Admiral Irwin) The berth and the shiplift, although of the same entity, are quite separate.

1535. Could I turn to Rosyth. What is the state of the emergency dock there?

[**Mr Key** *Cont*]

(Rear Admiral Irwin) We are having to replace the caissons at the in-board and out-board ends of the entrance lock to the basin. When we made the safety case for them we realised that they were not going to meet the seismic criteria so we have had to replace them and that will take some time.

1536. Can you say how long it will take?

(Rear Admiral Irwin) They will not be ready until early 1997.

1537. 1997?

(Rear Admiral Irwin) Yes.

1538. When exactly will the full through life safety clearance for all facilities at Faslane and Coulport be obtained?

(Rear Admiral Irwin) All facilities at Coulport have safety clearance now. The only ones outstanding at Faslane you have already mentioned and at Rosyth, again, it is only the RD-46, so you have covered them all. You can imagine that they are all going through one bottle-neck and the safety authority is having to do a lot of work to clear our safety cases. It does take time.

(Mr Lewis) Mr Key, could I just add on a point of detail, we have also got to complete one small aspect of the safety case for the so-called Northern Utilities Building at Faslane which is, as it were, the generating station. That is a relatively minor aspect which I do not think I need detain the Committee on, but just for completeness.

Mr McWilliam

1539. Would the safety case for the shiplift have been completed by now if it had not been for the failure of the raker piles, the ones that do not work?

(Rear Admiral Irwin) That is buried in time now. What has taken so long——

1540. Can I interrupt there. You are talking about proving the seismic case, the raker piles are the ones that take lateral shocks, lateral forces, and they failed so presumably that is why you cannot make the seismic case?

(Rear Admiral Irwin) No. They failed and were replaced.

(Mr Lewis) If I may, I stand to be corrected, but I do not think they actually failed. I think that their design was reviewed and under the standards that had come into force were thought possibly not to be adequate. There was something also, I believe, in the actual standard of construction. I do not think it was a case of failure.

(Rear Admiral Irwin) That is correct. That has not affected the safety case.

1541. That is not my recollection.

(Rear Admiral Irwin) Such as required was done to bring them up to the new standards.

Mr Key

1542. Turning to Devonport: last July there was a critical report from the National Audit Office. Could you tell us what has happened since then on the Devonport Works Programme and whether you are confident that it can be a success now? Have the designs been sufficiently detailed and the nuclear safety case established?

(Rear Admiral Irwin) You are moving beyond my own area. I will attempt to answer your questions but I may run out of knowledge. There is a lot of work going on at the moment between the MoD and Devonport Management Limited to establish a contract for them to build the facilities. What we are doing now, which I am sure is right, is getting the contract right before we start work. Therefore, it is taking a little time, longer than we had perhaps hoped, to establish the contract. Once we have done that Devonport Management Limited will have the freedom to go ahead and build D-154, the facility we require, and I am confident that they will achieve that within the time.

1543. Is the construction due to start still this time next year or in early 1996?

(Mr Lewis) I do not think anybody here is directly involved in the negotiations that are going on with DML and it is impossible really to predict how they will come out but the hope is, I understand, that they will be completed during the summer of this year. One would expect the preparatory work would begin shortly thereafter but when the main construction phase would actually commence I would imagine would be determined by its own contract which has yet to be finalised.

1544. I understand your difficulty here. I am concerned, of course, that it might have a knock-on effect on the contract price. For example, I understand that Plymouth City Council was asked for their approval as long ago as October last year and I wonder if you can tell us whether they have now approved the construction?

(Mr Lewis) I take it you are talking about the Notice Of Proposed Development that was submitted to the Council?

1545. Correct.

(Mr Lewis) That in fact has been approved by the Council since we submitted our written evidence. In fact a week after we submitted our written evidence to this Committee, on the 28 February.

1546. That is good news. Is the contract price irreversibly fixed?

(Mr Lewis) The contract has not yet been negotiated and the price therefore will not be fixed until that negotiation is completed.

1547. Has there been any change to the original cost, which I think was about £190 million?

(Mr Lewis) I am not aware of any change.

Chairman

1548. Can I just come back to the first question on works, the question of the dockyard projects and the £48 million increase in Trident allocation. I just want to clarify what that actually involves. Am I right in thinking what has happened is that Trident has been allocated £48 million more in the Devonport budget, as it were, and there has been, presumably, an offset of £48 million from another part of the dockyard project?

[**Chairman** *Cont*]

(Mr Lewis) Very close to that, Chairman, in fact the figure within the £48 million is £44 million arising from the Devonport project. What has happened is that the effect on the defence budget, defence spending is neutral, it is simply that within that total a greater part we now believe should be ascribed to the Trident programme. It may be that so-called attribution will change again, it is something that we are keeping under review as the design of the facility becomes progressively refined.

1549. It has not affected—except by a very minor degree—the total costing of the dockyard project?

(Mr Lewis) I do not believe that there has been any effect at all on the dockyard project, Chairman.

Mr Trotter

1550. I am a little concerned about how the money will work out. We recollect the very fiercely fought contest between Devonport and Rosyth on this issue which Devonport won. Can we be assured that at the end of the day the figures will come out as they were stated in the figures that were produced at the time of the competition?

(Mr Lewis) I think I would be venturing out a long way if I attempted to predict the outcome of the negotiation which is now in progress but I do recall that the decision to allocate that particular task to Devonport was taken in the light of a very careful comparison of prospective costs. To my knowledge nothing that has emerged so far has suggested that that comparison has been disturbed.

1551. So there has been no attempt by Devonport to increase the amount paid to them?

(Mr Lewis) I am afraid, Mr Trotter, that I do not know the answer to that question.

1552. Could we have a note on that, Mr Chairman?

(Mr Lewis) Certainly we will see how we can help the Committee.

Mr Viggers

1553. Admiral, in your initial remarks to us you rather surprised me. I must say, when you said that you had tasked AWE to promote rationalisation and there is further to go. Are you not a customer? How is it that you are tasking AWE?

(Rear Admiral Irwin) We are a Government owned contractor operated organisation. I own AWE, the contractor operates it for me.

1554. So you would regard it as your duty to task the contractor in that manner?

(Rear Admiral Irwin) Yes.

1555. You said there was much further to go, can you give us some ideas where you think those areas of rationalisation may be?

(Rear Admiral Irwin) Within the site at Aldermaston itself.

1556. How is diversification progressing?

(Rear Admiral Irwin) Disappointingly. Had diversification been something that solved all of our problems then we would not have found it necessary to shut Cardiff but AWE in its various guises does not have any competence to sell on the market which the market would wish to buy, that is not done for a similar price by other people. For instance, at Cardiff where they have some very high precision machine tool facilities, so also those facilities exist outside Cardiff. They do not have any greater edge to compete than anybody else and they cannot just take on a whole lot of work that does not exist.

1557. Where is the responsibility for promoting further diversification? Is that with you or with Hunting-BRAE?

(Rear Admiral Irwin) That is very much with Hunting-BRAE. It is part of our contract with them that they should do that.

(Mr Lewis) I was only going to say that whereas, as Admiral Irwin has indicated, the efforts made so far have not produced any hard evidence of prospective diversification, Hunting-BRAE are indeed in very close touch with relevant bodies in Wales, the Development Council and so forth, and will continue to do what they can to expose possible future uses for the site. If any such possible uses emerge then the Ministry of Defence will consider them quite openly and positively. This is something that we are anxious to promote but I think one would have to acknowledge that this is a defence and MoD owned facility. There are certain strict rules of Government accounting which would prescribe the circumstances in which the Cardiff factory was retained for commercial operation but various possibilities exist. One is not ruling it out but it would require very strong commercial input.

1558. As far as the flow of work is concerned, as far as the flow of research work is concerned, that is primarily entirely a matter for Government ordering presumably when you look ahead to flow and further research work in establishments?

(Rear Admiral Irwin) Yes but Cardiff is not a research establishment it is a production facility. The only system we are producing at the moment is Trident and the production of Trident is coming to its end.

1559. There is and has been a shortage of skilled staff specifically at Aldermaston, is this affecting the research programme?

(Rear Admiral Irwin) No, it is not. There continues to be a shortage in some areas. It means that we have to buy in short term contractors to fill a number of the gaps. It is something that we would not wish to see continue but the effect has not been noticeable so far. Dr Glue, would you like to add to that?

(Dr Glue) Just to agree with what the Admiral has said. There will always be a shortage at any one particular moment for skilled manpower. I am pleased to say that the numbers that we gave to the Committee in writing have been eaten into. The specialist reduction is less than the number we gave in writing to the Committee earlier this year but nonetheless there is still a shortage. It is not affecting the programme at the moment. The majority of the shortages are associated with manning our forward activities, associated with some of the system developments within the Establishment. Some part of that is to do with our AGEX programme. There is a shortage in the country

[**Mr Viggers** *Cont*]
of design mathematicians and mathematical physicists but with the kind of work we need on our AGEX programme we are confident we will be able to achieve that shortfall.

1560. As you said in your answer that the main problem area continue to be in the areas of safety and information systems I must put to you the question as to whether this affects safety?

(Dr Glue) No, there is no immediate impact. We are bridging our permanent manpower shortfall by bringing in short term contractor support. That is always an option we have. The safety workload in the Establishment clearly has increased as a result of Hunting-BRAE's safety development plan and the recent announcement of licensing will add marginally to that plan. The shortfall we have indicated in safety is being covered, as I say, by the contractor support. We will wish to convert that short-term contractor support to permanent employed staff but we are making sure that it does not impact on current activities.

1561. Since you mentioned the safety programme cost £250 million, will this be met by the contractor alone?

(Dr Glue) The £250 million that was given, Mr Chairman, in the written input—which was compared with the, I think, £300 million figure that was provided at this hearing last year—is for what I call the infrastructural activities at the Atomic Weapons Establishment and not necessarily for the safety and management system. Those amounts of money obviously are part of the agreed financial arrangements we have between Hunting-BRAE and ourselves.

1562. Can you explain how the savings from closures will be allocated between yourselves and the contractor? If savings are being made how are these shared?

(Mr Lewis) I think, again, as with the costs of the various infrastructure works that Dr Glue was describing, the effect of these changes are between the contractor and MoD. I think it would be disingenuous of me were I not to say that the MoD itself, as the owner of the site, clearly has a major responsibility for the costs and would expect also to be a major beneficiary of the financial savings that arise from the changes that are in prospect.

1563. Going back to the initial remarks, you were talking about the implementation of the Health and Safety Executive Report recommendations and you very helpfully spelled out that all these bar one have been met. Has the Compliance Office been satisfied with the rate of progress in implementing these recommendations?

(Rear Admiral Irwin) I do not think the Compliance Office would ever be satisfied. They are pleased with the rate of progress and they of course monitor it very carefully the whole time. As Dr Glue was previously the Director of Compliance he might like to add to that.

(Dr Glue) Just to add to what the Admiral has said. The implementation programme to cover those recommendations in the Health and Safety Report, that programme was agreed with the Health and Safety Executive and I can report the establishment is on programme with implementation. They have not all been implemented. There is a programme for implementation and that programme of implementation is on schedule. The Compliance Office, as this Committee will be aware from my presentation last year, monitors AWE very closely and is never satisfied but content that it is meeting the programme of implementation. Perhaps I can just add one point: that I do believe it is the Health and Safety Executive's view that they will return to the establishment later this year to review progress against that implementation programme.

1564. The NIA is anticipated to license Aldermaston and Burghfield in 1997; why the delay until 1997?

(Rear Admiral Irwin) It is not a delay. It is the length of time that we have agreed with the NII will be sensible to enable us to write the safety cases that they will wish to see which is going to take a lot of effort, a lot of manpower, without stopping everything else we are doing. We could take a lot of people off, concentrate them now and say: "All you are to do is to write safety cases" but if we did that we would interrupt the work going that is going on at Aldermaston. The year that we have agreed allows us to continue the normal work there while concentrating enough effort to produce sound safety cases that the NII wish to see.

1565. Have you costs of that particular programme?
(Rear Admiral Irwin) Yes, we have.

1566. What is the estimated cost?

(Dr Glue) The additional sum to move from the current safety development programme that the establishment is implementing to move towards a full site licence under NIA 65 we estimated was an additional £5 million I believe, together with some costs we need to meet for permanently placed, after licensing, NII inspectors which I think we have said was about £1½ million in total.

Mr Cook

1567. I would like to probe this relatively recently established relationship between the MoD and the contractor, to explain that. If I can cast my mind back to the mists of time when I was contracting, I had to account to my board of management for my inhouse behaviour and the degree or other of successes or failures. Similarly I had to account on behalf of the company to my purchaser for the level of performance that I gave them. By what means and against what criteria do you assess the efficacy of Hunting-BRAE or whoever?

(Rear Admiral Irwin) You are asking that question at a very interesting time because we are moving from a contract with Hunting-BRAE that was very similar to their being MoD employees to a contractual arrangement which would make them a contractor like any other contractor. Perhaps I could ask Dr Glue to explain the details.

(Dr Glue) As the Committee will be aware from their visit to AWE last year, we have a comprehensive performance monitoring system, largely centred around the Compliance Directorate but not solely. We have a number of other MoD agencies involved in that

[**Mr Cook** *Cont*]
exercise in terms of security, in terms of safety, in terms of quality, but the exercise was centred about the Compliance Directorate who carried out a number of exercises of monitoring, reviewing, and auditing the contractor against a set list of criteria and a performance evaluation plan. Each three months a performance assessment report is provided against that performance evaluation plan and that is submitted to the contractor. I gave some examples last year during the presentation of the form of that performance assessment plan which is comprehensive and covers predominantly safety, security and capability maintenance but also goes into programme——

1568. Are you generally satisfied that the performance levels that you are monitoring now are a significant improvement on those that existed before this relationship was established?

(Dr Glue) We are never totally satisfied, Chairman, with performance and one is always wanting performance to improve continually. There are some who expected contractorisation to be a magic wand and some of the issues which we were aware of before contractorisation would be closed out immediately. It will take some time. The new management structure has been there just two years, the Atomic Weapons Establishment has been there 45 years or so. As I indicated to the Committee last year, we are generally satisfied over a broad range of issues with Hunting-BRAE's performance in the first two years. That was the view I took last year to the Committee and I would endorse that view again. In certain areas, I think in their approach to the safety development programme and its implementation, I think it has been a good year for them and in terms of security awareness and implementation it has been a good year.

Mr Home Robertson

1569. On a related issue, could you say a little bit about decommissioning of surplus equipment, buildings and land on any of the AWE sites? Where is this material going to be taken to if it is going to be taken away and what is it going to cost?

(Rear Admiral Irwin) A tremendous amount of decommissioning does not involve nuclear radioactive materials at all so that sort of thing will be going on the whole time. Where radioactive materials are involved then if they are low level they can be taken to the site of Drigg, if they are above the level that can go to Drigg then they must be retained on site at Aldermaston.

1570. Can you give an indication of what volume of material or what weight of material is going to Drigg and what is being retained?

(Dr Glue) I am not able to give those figures at this time. No doubt we can provide a note.

1571. Likewise costs?

(Rear Admiral Irwin) Yes, we can do that at the same time.

Mr Trotter

1572. You referred, Admiral, in your introductory remarks, to the workload in the next century. Now here is an organisation whose principal activity presumably has been the designing and construction of the Trident warheads. That is going to end, presumably, before the end of the century, what is going to be the main occupation of Aldermaston? You mentioned the life of the Trident being 20 or 30 years, what are they going to do?

(Rear Admiral Irwin) Well, of course, Trident was only the last of the systems that Aldermaston developed, they have had an on-going programme of warheads for a very long time. They will not be required to build any new warheads but they will be required to refurbish the ones that we have so there will be a constant programme of returning warheads to AWE, overhauling them and sending them back to submarines which is necessary for the warheads themselves. It is necessary also for Aldermaston because we need to retain their expertise to assemble and to make nuclear weapons. The most important thing that they have been doing is developing the AGEX work and their expertise so that it will be possible to produce a replacement weapon should the Government ever ask it of us. May I ask Mr Thatcher to come in there if he wishes to?

(Mr Thatcher) I have nothing to add.

1573. It is going to be less interesting for the scientists though, is it not, if they have completed the design of the principal system?

(Rear Admiral Irwin) You have put your finger on one of our bigger problems, yes.

(Dr Glue) Could I add, Mr Chairman, it will be an even greater challenge I suspect to the scientist to develop a suite of above ground experimental techniques to replace underground tests. I think that is a significant challenge for those scientists and I suspect it will be more interesting than perhaps you might suggest.

Chairman: Let us move on then to the nuclear safety champion.

Mr Viggers

1574. We are interested that the nuclear safety champion should have a more regulatory authority than in the past to fulfil his function properly, including, of course, public awareness of any recommendations he has made. Can you say whether he has recommended any significant alterations to those parts of the programme under his review?

(Rear Admiral Irwin) He has reviewed extensively and he has made recommendations which will affect the future design of nuclear weapons. He has also made recommendations about associated areas like the storage of nuclear weapons and that sort of thing. He has carried out a series of audits of the way that we conduct our work. Of course, whenever you carry out an audit you find things that can be done better, so he has added a lot of value to safety by his constantly challenging and asking and looking into what we are doing. He has certainly provided an independent look.

(Dr Glue) The Committee will be aware from the written input on the programme which the safety champion has undertaken, that programme is consistent I believe with the original report from Sir Robert Oxburgh from which the safety champion was formed. That forward programme, I think as the Admiral has

[**Mr Viggers** *Cont*]
indicated, is a broad, comprehensive one and a challenging programme. Certainly I have had much involvement with the safety champion over the last year. He has involved himself in those areas that the Admiral has indicated and, as with any monitoring or audit review function, has flagged up issues where we could have done things better. It has been a comprehensive and independent and thought provoking exercise.

1575. Will he be allowed to publish his recommendations?

(Rear Admiral Irwin) His recommendations are made to the Chief Scientific Adviser and the Chief of Defence Procurement. There are none that would merit publication outside the Ministry of Defence.

1576. For security reasons obviously?

(Rear Admiral Irwin) Partly that, partly because he has not found any safety worries that should be exposed, anything that is of any great import.

Mr Home Robertson: Why not say so?

Mr Viggers

1577. Other regulatory bodies publish a summary of their annual activity without, if appropriate, naming names or giving details which would allow the case to be identified specifically. Does he publish such a summary?

(Rear Admiral Irwin) No, he does not.

1578. Would it not be possible for him to publish such a summary in exactly the same way as other regulatory bodies publish a summary of their activities without disclosing details which would give away confidential information?

(Mr Lewis) If I may say so, it is important to make a distinction between what the so-called safety champion does and what a regulatory body is. The nuclear weapons' safety adviser is accountable, as Admiral Irwin has said, to the Chief of Defence Procurement and the Chief Scientific Adviser and they in their turn to Ministers, and Ministers, of course, to Parliament. The nature of the appointment is such that any more general reporting function would muddy the direct accountability of Ministers to Parliament, that is how it is seen at present.

Mr Viggers: You are, of course, justly calling for that. We recommended that his reports be made public and this was rejected by the Government. I simply put it to you, without expecting you to be able to respond, that a summary of his activities might be a reasonable substitute and compromise.

Chairman

1579. Also I would like to clarify what the Admiral said, that one of the reasons that this was not done was because nothing had been found.

(Rear Admiral Irwin) No, I did not say nothing had been found. I said that nothing that would merit its exposure to the public. He has found many very minor things.

1580. If something were found which would merit its disclosure to Parliament would the nuclear safety champion have the right to disclose it?

(Rear Admiral Irwin) He would have, and does have, access to the Secretary of State.

1581. I think the answer to my question is almost certainly no. Perhaps we will explore that on another occasion.

(Rear Admiral Irwin) Can I take this opportunity, Mr Chairman, while there is a slight pause, to say that Mr Thatcher would like to make a slight amendment to something that he said earlier on.

(Mr Thatcher) Sorry, Chairman, merely a point of clarification to Mr Campbell's question when we were talking about arms' reductions. I am not certain that I made it sufficiently clear that in talking about a yard stick, the point I was trying to convey was that warhead numbers or warhead yields are not the only or the final yardstick for deciding what constitutes a minimum deterrent, albeit that the number of warheads is a frequently used currency in the discussion of armaments' reductions.

Chairman: Unfortunately Mr Campbell is not here to pursue that however Mr Cook would probably like to.

Mr Cook

1582. I am still interested in this business of minimum but you have already closed my mouth on that one. I think it is crucial to some of the discussions we have had this morning. If I touch on a different point, because I do not want to be silenced again, on the Order Paper at the present time is a motion which contests the extension of the Fissile Material Exchange Clause of the United States/United Kingdom Mutual Defence Agreement which dates back to 1958. It contests the extension of that for a further 10 years. Now if that were to go through or any other amendments were to go through or if the agreement was cancelled, what effect would that have on the Trident programme?

(Dr Glue) Clearly as far as the work of the Atomic Weapons Establishment is concerned and its contribution to the Trident programme, we do have significant collaboration with the United States under the 1958 agreement and no doubt any future scenario where that collaboration was not possible would make the task that much more difficult.

1583. Do they supply us with fissile material or do we supply them or is it both?

(Dr Glue) The 1958 agreement allows for interchange of information and of materials. I would not wish to go beyond that statement.

Mr Cook: I am not up to flogging dead horses today.

Mr Viggers

1584. Can I just jog back to the WE177 free-fall nuclear bombs. Mr Thatcher gave us some information about this earlier. Can you update us on the number of these currently in service?

(Mr Thatcher) We have indicated previously that the weapons that have been deployed on ships have been withdrawn and that there has been of the order of a 50 per cent cut in the total number of weapons. We have not made any more detailed information on numbers.

1585. You did say earlier that the Government was reviewing the end of service date of 2007. This is, of

[**Mr Viggers** *Cont*]
course, in contrast to the earlier situation where the life of the WE177 was extended. Were lessons learnt about the nuclear weapons and the possible extension of their lives as a result of these extensions in 177?

(Rear Admiral Irwin) One learns just by having weapons for longer because we have a surveillance programme and every year weapons are brought back and stripped and finely checked and tested to make sure that the various components are still in the condition that they were in when they were assembled. So the longer you keep a weapon the more that you bring back older weapons and strip them and the more that you learn about the life of weapons. So it is possible, as our knowledge develops, to go on extending the life, and the longer we keep these weapons in service the more we will learn.

1586. Has that knowledge given you read across that you can apply to the Trident programme?

(Rear Admiral Irwin) Yes, certainly it has and we shall.

1587. Do you still anticipate that the life of the Trident programme will be as originally planned or do you think that you have learned something which will allow you to extend it?

(Rear Admiral Irwin) There is a tremendous number of things that come together in the life of a Trident programme. The requirement laid on me by the staff requirement is for a minimum life of 25 years. That does not mean to say any one item has got to last 25 years because you can have a programme that replaces it. When we bring the warheads back and look at them we may decide at some stage that it is necessary to replace a component within them. If that were to happen we would be able to do just that. I see no reason at all at the moment why the life should not be at least 25 years and probably longer. I mentioned earlier on that the life of the Trident missile has so far been set at 20 years but that is based entirely on Trident 1 experience and the understanding, although they have not yet got to the stage of saying this, is that the Americans will advance that probably to 30 years. That is just one of the many elements that come together to define what the life would be. I see nothing at the moment that would stop this system going for more than 25 years.

Mr Trotter

1588. When were the 177s built?

(Rear Admiral Irwin) Over a very extended period. When were they first started?

(Mr Thatcher) It would be the late 1960s, early 1970s.

1589. And the last ones, roughly?

(Rear Admiral Irwin) In the late 1970s.

(Mr Thatcher) All the 177s were in the stockpile by the latter part of the 1970s.

1590. You have said that you had withdrawn half of them. Have you dismantled the ones that have been withdrawn?

(Rear Admiral Irwin) Some are dismantled, some are being dismantled.

1591. The aim is to dismantle all of them?

(Rear Admiral Irwin) Yes.

1592. There has not been a test of the 177 presumably for many years, is that right?

(Rear Admiral Irwin) There has not been what I think you would call a test, that is to say that it has been detonated underground but individual components are regularly surveyed and tested. So we know that no individual component is going to prevent it working and therefore it is safe to assume that it will work.

1593. Would the ban for the future prevent those particular tests?

(Rear Admiral Irwin) No, those are tests of fuses and so on.

1594. So you are satisfied therefore that the 177 works and from that it would seem to follow that you could be satisfied equally that the Trident will work?

(Rear Admiral Irwin) One can always be satisfied as long as one does not have to make a change. If when we surveyed a Trident warhead in 10 years' time we determined that a component was ageing at a speed we had not anticipated and we had to replace it, it might be that there was not then that component available and we might have to make a similar component possibly using different materials. The fear at the back of our mind is that we might have to make some change that when we had done it we did not have quite so much confidence that it was 100 per cent as it was before. That is one of the reasons why we would like to retain the ability to underground test. It is one of the reasons why we must make sure that we have above ground tests that can give us that confidence. At the moment I see no reason to think we are in that position.

(Mr Thatcher) Although we have not tested the WE-177 there has been nuclear testing and therefore confidence in the designers and the people who are making the assessments was maintained through the demonstration that the other underground tests were offering.

1595. You mean the D-5?

(Mr Thatcher) Whatever underground tests.

1596. Our tests? British tests?

(Mr Thatcher) Yes, our tests. As has been said in previous sessions, one of the challenges is to sustain confidence in the people who will be making the assessments in the future when their feet have not been put to that particular fire.

(Dr Glue) Could I add, Mr Chairman, that we test, as I think we told the Committee last year, for a wide range of reasons. One that Mr Thatcher has indicated has been to ensure that both our designers and the tools that they have at their disposal are fully up to date and are able to make the kind of assessments in the absence of a specific 177 test to continue to underwrite that performance.

Chairman

1597. It must inhibit also any possible enhancements you might wish to build in either for safety reasons or other reasons if you cannot then test fully the entire equipment?

(Rear Admiral Irwin) That is absolutely right, Mr Chairman, yes.

Mr Trotter

1598. Has the 177 been amended at all over that period of time?

(Rear Admiral Irwin) Certainly it will have been amended in small ways but nothing that has needed to come to my notice.

Mr McWilliam

1599. You are not implying, Admiral, that the Trident warhead has not received an underground test, are you?

(Rear Admiral Irwin) No, certainly not.

Mr McWilliam: I did not think you were but it sounded like that.

Mr Trotter

1600. There was some rather twisted wording.

(Rear Admiral Irwin) I did not intend to convey that.

Chairman: Admiral, gentlemen, I think that concludes the session. Thank you very much indeed for attending.

WRITTEN EVIDENCE

1. Memorandum submitted by the Ministry of Defence on the Revised Trident Estimate (26 January 1995)

REPORT ON TRIDENT BY THE MINISTRY OF DEFENCE

1. 1994 saw significant progress in all areas of the Trident programme, with the first submarine entering operational service on time in December. The project remains within budget.

THE SUBMARINE PROGRAMME

2. The first Trident submarine, HMS *Vanguard*, successfully launched two unarmed Trident D5 missiles on the United States' Eastern Range on 26 May and 19 June, respectively; as part of her Demonstration and Shakedown Operation (DASO). In July she collected sixteen unarmed Trident D5 missiles from the US Strategic Weapons Facility Atlantic, Kings Bay, Georgia, returning to the UK in September for final preparations for deployment, including the fitting of UK designed and built warheads to her missiles.

3. The second submarine, HMS *Victorious*, completed successful contractor's sea trials in August returning to Vickers Shipbuilding and Engineering Limited at Barrow for finishing work. HMS *Victorious* was commissioned on 7 January 1995 and handed over to the Royal Navy on 25 January. She remains on course to enter service towards the end of 1995 or early in 1996. The construction of the third and fourth submarines, *Vigilant* and *Vengeance* (whose name was announced in May), is progressing well with preparations for *Vigilant*'s planned roll out later this year well underway.

STRATEGIC WEAPON SYSTEM

4. Both Trident D5 missile test firings by HMS *Vanguard* in the summer were highly successful, with results confirming the performance predicted and comparable with equivalent US Trident D5 firings. All clearances necessary to support the recent deployment of the Strategic Weapon System in HMS *Vanguard* have been obtained. HMS *Victorious* is due to undertake her DASO missile test firings in the US this summer. Testing and installation of Strategic Weapon System equipment in *Vigilant* and *Vengeance* is making steady progress.

TACTICAL WEAPON SYSTEM

5. Steady progress with the submarines' Tactical Weapon System, including Sonar 2054 and the Submarine Command System, has been made during the past year. Work to resolve operability and reliability problems identified in earlier trials has continued with improved sonar and command system software installed in HMS *Vanguard* and a programme to address outstanding difficulties underway. An important milestone achieved was the clearance of the Command System to launch *Spearfish* torpedoes. Following an extensive programme of testing and evaluation, the Tactical Weapon System has been cleared to support HMS *Vanguard*'s deployment. The Tactical Weapon System production programme remains on schedule.

WARHEAD

6. The warhead production programme continues to meet the requirements of the Trident programme. Commissioning of new facilities at the Atomic Weapons Establishment (AWE) is progressing satisfactorily. Following contractorisation of the management and operation of the AWE sites in April 1993, the Health and Safety Executive undertook a review of their management and safety, and work on the recommendations has begun. The one recommendation for the Ministry of Defence concerning licensing is accepted in principle by the Government.

TRIDENT WORKS

7. The facilities at the Clyde Submarine Base, and the Royal Naval Armament Depot, Coulport, have been providing support to HMS *Vanguard* and HMS *Victorious* during trials over the past year. Work to achieve full clearances for the unrestricted use of all facilities is continuing. HMS *Vanguard* was successfully lifted on the shiplift in October, marking an important stage in the operational proving programme.

TRIDENT AND INDUSTRY

8. It is assessed that the Trident programme will provide some 6,500 direct and 6,000 indirect jobs on average over its total procurement period with some 5,500 direct and 5,000 indirect jobs during the current financial year. In addition to the main contracts placed directly in the UK, by the end of September 1994 British firms had been awarded 601 US programme contracts with a value of over $211 million.

COST ESTIMATE

9. With all costs brought up to a common price base (the "non-hybrid" basis), the cost of the Trident programme is now estimated at £11,602 million. Project costs have decreased by £211 million in real terms. Expenditure on the Trident Programme to October 1994 was £7.6 billion. If this past expenditure is included at the prices and exchange rates actually incurred, with future expenditure expressed at today's prices (the "hybrid" basis), the equivalent total estimate is now £9,770 million. The following tables show the principal changes from the previous non-hybrid and hybrid estimates of £11,631 million and £9,937 million.

10. The proportion of the Defence budget which the Trident programme is expected to take over its 20 year procurement period remains at less than 2½ per cent on average.

Estimate Table (Non-Hybrid)[1]

	US £ million	*($ million)*	*UK £ million*	*Total £ million*
Previous estimate (February 1994) @ £1 = $1.44	3,535	5,090	8,096	11,631
Real changes @ £1 = $1.44 1993–94 prices	−76	−109	−134	−211
Price Inflation	+80 (2.3%)	+115	+277 (3.5%)	+35.7
Exchange Rate Variation	−96			−96
Revised Estimate @ £1 = $1.48 1994–95 prices	3,443	5,096	8,239	11,682
US/UK percentage	29%		71%	100%

Note:
1. Figures rounded to nearest £ million hence any apparent imbalances. The change in the percentage breakdown between the main cost elements are as follows:

	1994	*1995*
1. Submarine (less weapon systems equipment)	36%	36%
2. Weapon system equipment including Tactical Systems	20%	20%
3. Missiles	12%	11%
4. Shore construction	11%	12%
5. Warhead, miscellaneous, unallocated contingency etc	21%	21%

Estimate Table (Hybrid)[1]

	US[3] *£ million*	*UK £ million*	*Total £ million*
Previous estimate (February 1994) @ £1 = $1.44	3,061	6,876	9,937
Real changes @ £1 = $1.44 1993–94 prices	−76	−134	−211
Price inflation	+20 (2.0%)	+51 (3.4%)	+71
Exchange rate variation	−28		−28
Revised Estimate[2] @ £1 = $1.48 1994–95 prices	2,977	6,794	9,770
US/UK percentage	30%	70%	100%

Notes:
1. Figures rounded to nearest £ million hence any apparent imbalances.
2. Exchange rates are applied to unspent balances only.
3. No direct US$ comparison has been provided as costs incurred in past years use varying exchange rates. However, the US element is as follows:

	$ million
Spend to end 1994/95 (estimated and using variable £/$ exchange rates):	3,628
Unspent balance at £1 = $1.48:	1,063
Total:	4,691

The change in the percentage breakdown between the main cost elements are as follows:

	1994	*1995*
1. Submarine (less weapon systems equipment)	37%	37%
2. Weapon system equipment including Tactical Systems	19%	19%
3. Missiles	12%	12%
4. Shore construction	11%	11%
5. Warhead, miscellaneous, unallocated contingency etc	21%	21%

2. Memorandum submitted by the Ministry of Defence responding to the Committee's questions on the Trident programme and AWE (22 February 1995)

A. THE ESTIMATE

Q1. The Committee would be grateful for an updated version of answer 1, parts (a), (b) and (c) (including any explanation of changes) in the Ministry's Memorandum of 3 February 1994, published in the Committee's Second Report of Session 1993–94, HC 297, pages 223–4 (the 1994 Report).

A1.
a. Programme costs

	£ million		
	US	*UK*	*Total*
November 1981 Estimate (September 81 prices $1.78)	3,313	4,207	7,520
	(44%)	(56%)	
Price inflation	2,128	4,606	6,735
Exchange rate variation	1,103	—	1,103
November 1981 estimate (1994–95 prices $1.48)	6,544	8,813	15,358
Kings Bay Savings (1994–95 prices $1.48)	−399	−766	−1,164
Other real cost changes (1994–95 prices $1.48)			
(1) Submarine	−281	−1,055	−1,336
(2) Strategic Weapon Systems (SWS) equipment	−549	5	−545
(3) SWS missiles	−864	−46	−910
(4) Tactical Weapon Systems (TWS)	2	290	292
(5) Shore construction (excluding dockyard projects)	—	822	822
(6) Dockyard projects and functional machinery	—	79	79
(7) Warhead, miscellaneous and unallocated contingency	−1,010	96	−915
Current Estimate (1994–95 prices $1.48)	3,443	8,239	11,682
	(29%)	(71%)	

Note: Figures are rounded to the nearest £ million, hence any apparent imbalances.

b. Breakdown of Costs

	Nov 1981 Estimate (£ million) Sept 81 prices $1.78			*1981 Estimate (£ million) 1994–95 prices $1.48 (Note 2)*			*Current Estimate (£ million) 1994–95 prices $1.48 (Note 2)*		
	US	*UK*	*Total*	*US*	*UK*	*Total*	*US*	*UK*	*Total*
Submarines	267	2,333	2,600	521	5,058	5,579	240	4,003	4,243
SWS Equipment	918	74	992	1,765	145	1,910	1,216	150	1,366
SWS Missile	1,275	44	1,319	2,104	46	2,150	1,240	—	1,240
Tactical Weapon Systems	—	326	326	—	694	694	2	983	985
Shore construction	—	579	579	—	545	545	—	1,368	1,368
Dockyard projects and functional machinery	—	—	—	—	90	90	—	169	169
Warhead, miscellaneous and unallocated contingency	853	851	1,704	1,755	1,469	3,224	745	1,565	2,310
Totals	3,313	4,207	7,520	6,146	8,048	14,193	3,443	8,239	11,682
	(44%)	(56%)		(43%)	(57%)		(29%)	(71%)	

Note: 1. Figures are rounded to nearest £ million, hence any apparent imbalances.
2. The 1981 estimate (1994–95 prices $1.48) and the current estimate are presented net of savings resulting from the decision to process missiles at Kings Bay.

Explanation of changes (Totals)

	£ million		
	US	*UK*	*Total*
November 1981 Estimate (September 1981 prices $1.78)	3,313	4,207	7,520
Price inflation	2,128	4,606	6,735
Exchange rate variation	1,103	—	1,103
Kings Bay changes	−399	−766	−1,164
Cost changes	−2,703	191	−2,512
Current estimate (1994–95 prices $1.48)	3,443	8,239	11,682

Note: Figures are rounded to nearest £ million, hence any apparent imbalances.

c. Effect of Exchange Rate Variations (non hybrid estimates)

	1981 Estimates £ million (dollar content of $9,096 million at current price levels)			*Current Estimate £ million (dollar content of $5,096 million at current price levels)*		
	US	*UK*	*Total*	*US*	*UK*	*Total*
1. $1/£1	9,096	8,048	17,144	5,096	8,239	13,335
2. $1.25/£1	7,277	8,048	15,325	4,077	8,239	12,316
3. $1.48/£1	6,146	8,048	14,193	3,443	8,239	11,682
4. $1.50/£1	6,064	8,048	14,112	3,397	8,239	11,636
5. $2/£1	4,548	8,048	12,596	2,548	8,239	10,787

Estimates are net of savings resulting from the decision to process missiles at Kings Bay.

Q2. How much has been (a) spent and (b) committed on Trident in (i) the UK and (ii) the US, up to the latest available date?

A2. (a) Expenditure on Trident up to November 1994 is:
(i) £5,505 million in UK;
(ii) £2,131 million in the US.

(b) Commitment on Trident up to November 1994 is:
(i) £6,388 million in UK;
(ii) £2,236 million in the US.

Note: All figures are hybrid (i.e. at outturn prices).

Q3. The Committee would also be grateful for an updated version of the information given in Answer 3 on pages 24–25 of the 1994 Report.

A3a. A summary of gross increases and reductions in real costs for the UK and US parts of the programme are as follows:

	£ million 1993–94 prices $1.44		
	US	*UK*	*Total*
Submarine	0	−70	−70
SWS Equipment	−7	−3	−10
SWS Missiles	−26	0	−26
TWS	0	−15	−15
Shore Construction (excluding Dockyard Projects)	0	−10	−10
Dockyard projects and functional machinery	0	48	48
Warhead, miscellaneous and unallocated contingency	−43	−85	−129
Totals	−76	−134	−211

Note: Figures are hybrid estimates rounded to the nearest £ million, hence any apparent imbalances.

A3b. The actual expenditure on Trident and Polaris for 1993–94 and the estimated expenditure for 1994–95 is as follows:

	£ million	
	1993–94	*1994–95*
Trident	979	824
Polaris	103	78

Note: The Trident expenditure figures include running costs.

A3c. In previous years information on R&D expenditure has been provided in relation to the MoD's classified Programme Element Costing. This particular document has now been superseded. Actual expenditure on research and development associated with Trident during 1993–94 was some £9.0 million and estimated expenditure for 1994–95 is £9.3 million.

A3d. Expenditure on the four Vanguard class submarines to December 1994 at hybrid prices is as follows:

	£ million
HMS *Vanguard*	1,110
HMS *Victorious*	638
Vigilant	491
Vengeance	308

A3e. Contingencies included within each programme element at 1994–95 prices and $1.48 are as follows (last year's figures at 93–94 prices and $1.44 in brackets):

		£ million	*(£ million)*
(a)	Submarine	40	(64)
(b)	Strategic Weapon System	14	(23)
(c)	Tactical Weapon System	—	—
(d)	Shore Construction (excluding dockyard projects)	14	(17)
(e)	Dockyard projects and functional machinery	25	(20)
(f)	Warhead, miscellaneous and unallocated contingency (of which unallocated contingency is £153 million (£221 million))	154	(223)

A3f. The phasing of Trident expenditure by period (lines (a) and (b) at hybrid prices, and lines (c) and (d) at 1994–95 prices and $1.48) is as follows:

		£ million	
		UK	*US*
(a)	1980–81 to 1984–85	174	176
(b)	1985–86 to 1989–90	2,197	631
(c)	1990–91 to 1994–95	3,265	1,451
(d)	1995–96 onwards	1,156	718

Note: These total to the hybrid project total estimate of £9,770 million. Figures rounded to nearest £ million.

A3g. Forecast expenditure for 1995–96 and 1996–97 at 1994–95 prices and $1.48 is as follows:

(a)	1995–96	£456 million
(b)	1996–97	£369 million

Q4. With reference to the unprinted answer to Q3 on page 30 of the 1994 Report, the Committee would be assisted by:

(a) a note on the components of each of the broken-down headings, ie "logistic support", "dockyard projects" etc;

*(b) a note explaining why the * * * "other support" costs in the 1994 estimate are not included in the 1981 estimate;*

(c) a note on the discrepancy between the 1981 and 1994 estimates for division of "nuclear" costs between the UK and the US;

(d) a note explaining the extent of the sum included as "additional intramural" costs; and

*(e) a note on the *** real cost rise in A3b attributed to "nuclear" costs in the US.*

The Committee would also be grateful for an updated version of this answer.

A4a. The components of each of the broken-down headings is as follows:

"Logistic Support" comprises Trident attributable costs for first outfit of spares and associated functional machinery;

"Dockyard Projects" (which were included under the "Miscellaneous" heading in the original November 1981 estimate only) comprise the Trident attributable capital costs of the Rosyth Dockyard Emergency Docking Facility (RD46) and Submarine Refitting Facility (RD57);

"Other Support" comprises Trident attributable elements of the Interim Deperming Facility, Magnetic Measurement Instrumentation, HMS Dolphin Training Facility, Electronic Countermeasures facilities, the Clyde Submarine Base Safety Studies, and the Far Field Magnetic Ranges. This segment of the Budget was created in 1986 following a reorganisation—earlier costs were contained within other headings;

* * *

"Additional Intramural" costs are staff costs which, but for Trident, would not be required and are therefore specifically attributed to the Trident procurement programme;

"Central Contingency" (also described as the "unallocated contingency") is additional to the contingency margins applied to the various projects within the Trident programme (Answer 3e) and reflects the Ministry of Defence's appreciation of overall risk.

A4b. Detailed costings for those items listed in the answer to question 4a above were not separately identified until later in the programme. Also the "Other Support" items reflect the now separate identification of tasks to reflect Departmental organisational changes.

A4c. ***

A4d. This represents the staff costs which, but for Trident, would not be required.

* * *

An updated table is attached.

Q5. The Committee would be assisted by a note on any changes to the estimated total and to the breakdown of Trident operating costs as given in the answer to Q2 on pages 29–30 of the 1994 Report.

A5. There is no change to either the total estimate or the breakdown of Trident lifetime operating costs given to the Committee last year (answer to Q2, pages 29–30 of the 1994 report) and this remains our best assessment of these costs. As was said in the formal response to the Defence Committee's 1993 Sixth Report (Session 1992–93) on "The Progress of the Trident Programme", the Government believes that there would be no value in 'attempting to revise the current estimate of Trident lifetime operating costs until greater experience of Trident operations is gained'. The figure of £6 billion does not change for inflation due to rounding (after application of the GDP deflator of 2 per cent). There is no change to the broad shares attributed to the elements identified during oral evidence in March 1993 (minutes of evidence Q1440).

Q6. The Committee has asked for an updated note on the progress of each of the four Vanguard class submarines.

A6. Following completion of her post acceptance trials, which included two successful missile firings, HMS *Vanguard* commenced her first patrol on time in December 1994. Submarine performance is very satisfactory.

HMS *Victorious* completed a very successful Contractor Sea Trials (CSTs) programme with few defects in August 1994. Following completion of final work by the contractor at Barrow-In-Furness, she sailed to Faslane and was accepted from the contractor in January 1995. The standard of finish and performance is regarded as very good. HMS *Victorious* is now undergoing her post acceptance trials and is on schedule to meet her planned in service date.

Vigilant is due to be rolled out, from the Devonshire Dock Hall at Barrow later this year. Outfitting and testing of the submarine's many systems and equipments is progressing steadily.

Vengeance's major hull units are being joined together in the construction hall, all missile tubes are in position, and alignment checks of the Sonar 2054 bow array have commenced. Fitting out is making satisfactory progress.

Q7a. Have the problems concerning the Tactical Weapon System (TWS) been resolved? Have all elements of the system now been fully tested?

Q7b. Are the scheduled targets for successive issues of SMCS software been met? Is the programme now complete?

A7a. All elements of the TWS have been fully tested. Whilst some problems with the Sonar suite remain, the TWS in HMS *Vanguard* is capable of supporting deterrent patrols. A programme of work to resolve some outstanding system operability issues is in hand.

A7b. While there have been some delays in the SMCS software development programme, the key functionality objectives have been met and HMS *Vanguard* deployed with Command System software able to support deterrent patrols. Two further issues of software are planned, which are aimed at improving reliability and resolving some outstanding operability issues. The programme is scheduled to complete in mid 1995.

Q8. Following the withdrawal of HMS Resolution from service, the Committee would be grateful for a note on arrangements for the transition from Polaris to Trident submarines and on the number of SSBNs that have been and will be available for patrol during this period.

A8. The transition from Polaris to Trident SSBNs is being structured to ensure that continuous deterrent patrols are maintained. Taking the transition period as commencing in October 1994 (when HMS Resolution paid off), our expectation has been and remains that at least two SSBNs will be available in the patrol cycle at any time;

Q9a. Are further missiles to be purchased from the United States in Fiscal Year 1995?

Q9b. Are any further changes in the purchase and running costs of D5 missiles expected?

Q9c. Has any alteration been made to the timetable for missile purchase (which, as stated in the Government Reply to the Sixth Report of Session 1992-93, was likely to be completed in 4-6 years)?

Q9d. Have all modifications required for the use of Trident in a sub-strategic role now been completed?

A9a. No D5 missiles are planned to be purchased from the United States in Fiscal Year 1995.

A9b. UK plans for D5 missile procurement have been dovetailed with those of the US to ensure the requirements of both nations are met as economically possible. No changes to the running costs are expected but purchase costs may change prior to the placing of contracts, in either direction, according to joint US/UK ordering expectations.

A9c. The timetable for missile purchase has not changed from that stated in the Government Reply to the Sixth Report of Session 1992-93, which means that this is now forecast to complete in 2-4 years.

A9d. All essential modifications required for the use of Trident in a sub-strategic role will be completed before the Vanguard Class SSBNs are assigned to this role.

Q10. The Committee would be grateful for a note on the development of non-nuclear experimental testing of Trident warheads, and on any co-operation on these matters with France and the United States.

A10. As reported to the Committee last year, we have for many years employed a range of techniques such as above ground experiments, work with lasers and computer simulation in addition to underground testing to underwrite the safety and reliability of our weapons stockpile. In the absence of testing we intend to develop our experimental techniques and facilities in such areas, and also to exploit the large quantities of data that we have acquired from past underground testing and other work. These will be progressive developments, undertaken in continuing cooperation with the United States, which will contribute to the safe stewardship of Trident throughout its service life as well as to sustaining capabilities to meet future requirements We have also had some discussions with the French authorities on issues related to nuclear weapons stewardship, but it is too early to say exactly how this may develop.

Q11. The Committee would be grateful for a breakdown of any further unscheduled stops of TCHD Mark II vehicles since 29 January 1994; and for information as to whether the costs of repairs were covered by warranty, and, if not, what those repairs cost MoD.

A11. A breakdown of unscheduled stops by TCHD Mark II vehicles between 29 January 1994 and 30 January 1995 is attached. Of the 4 incidents, three were found on investigation to involve no fault with the vehicle. The warranty was not applicable to the fourth incident and the necessary repairs were carried out by RAF technicians in accordance with normal operating practice.

TCHD Mk 2 Operational Convoy Unscheduled Stops (29 January 1994 to 30 January 1995)

Serial	*Date*	*Nature of Defect*	*Time Delay*	*Repair Action*	*Comments*
1	6 Jun 94	Knocking sound	33mins	None	Precautionary stop, no fault found.
2	7 Jun 94	Air pressure warning	34mins	Alarm buzzer isolated	Air pressure satisfactory. No fault found.
3	2 Aug 94	''clonking'' sound when turning	26mins	None	Cab tilted. No fault found.
4	21 Sep 94	Discharge from sump oil connecting pipe	See Comments	Tractor unit changed	Fault developed shortly after departure. After replacement of spare tractor it was agreed convoy should return and await arrival of a substitute spare unit. Movement therefore suspended for 24 hours.

Q12. The Committee has asked for a note on the Nuclear Safety Champion's current planned programme of work.

A12. The Nuclear Safety Champion's current and planned programme of work includes:

(a) Continual examination and auditing for completeness and quality of aspects of the Trident safety case;

(b) Review of SSBN safety management where relevant to the Strategic Weapons System safety;

(c) Regular auditing of the safety management systems involved in the transport of nuclear weapons;

(d) Monitoring and, once this is complete, auditing of the safety design review of the WE177 weapons system;

(e) Advising the Ministry of Defence's Equipment Approvals Committee on the treatment of systems safety for the substrategic version of Trident;

(f) Monitoring of those aspects of research programmes at AWE and other establishments which have a bearing on the safety of nuclear weapons;

(g) Promoting best practice in safety matters relating to the ownership of nuclear weapons and liaison with US officials in comparing respective approaches to the management of nuclear weapon safety. Safety management in industry will also be studied for comparison.

Q13. The Committee has asked for a note on any breaches of security at Coulport during the last year and on improvements to security made since the breaches in December 1992.

A13. During 1994 there were sixteen anti-nuclear demonstrations at the Royal Naval Armament Depot Coulport but only three incursions:

23 January: 3 individuals were arrested following an incursion through the perimeter fence which was cut below the high water mark;

21 March: 4 individuals were arrested following an incursion through the perimeter fence;

12 June: 2 individuals scaled the perimeter fence and were arrested.

Security improvements introduced since December 1992 include enhanced and more widespread training and exercises, regular reviews of security procedures and their implementation and improved co-ordination of security arrangements between the Depot and the Clyde Submarine Base. The perimeter fence intruder detection system is also being upgraded progressively and all facility security systems are now linked to the Depot Emergency Headquarters via an intruder detection system.

Q14. The Committee would be assisted by a note on progress with the Trident refitting facilities at Devonport; and on whether there have been any changes on the original estimates.

A14. The necessary Notice of Proposed Development for the Trident refitting facilities was submitted to Plymouth City Council on 7 October 1994 and a response is awaited. Meanwhile work is proceeding on both the design and the nuclear safety case. A contract proposal has been received from Devonport Management Limited for the completion of all works. This proposal, which includes cost estimates, is currently subject to negotiation.

Q15. The Committee would be assisted by an update to the answer to Q38 on page 46 of the 1994 Report.

A15. The facilities at Faslane and Coulport have been brought progressively into use over the past year. As well as supporting the trials programme of HMS VANGUARD and HMS VICTORIOUS, the facilities were used for warheading VANGUARD's missiles and raising the submarine out of the water for inspection prior to her operational deployment. The only facility which, for reasons associated with the contract, remains to be handed over is the crane on 12 Berth at Faslane. Handover is expected shortly.

As experience of using the shiplift at Faslane is gained, work continues to progress on the establishment of the full throughlife design safety case. Meanwhile, all lifts of nuclear submarines are subject to the full prior approval of the relevant nuclear safety authorities. The through-life safety case is expected to be established this year.

The temporary road built by the Ministry of Defence between Loch Lomond and Faslane to enable construction traffic to avoid local communities is to be adopted permanently as a public road. The necessary improvements are being funded by the Ministry of Defence.

Q16a. What are the current shortfalls of staff at AWE Aldermaston, Burghfield and Cardiff in each of the following categories:

(i) Supervisory, Administrative, Executive and Clerical grades;

(ii) Specialists;

(iii) Industrials, Craft; and

(iv) Industrials, Non-craft?

Q16b. Have there been any significant changes in the last year to pay and conditions for staff at AWE?

Q16c. What is the present turnover of staff at (i) AWE Aldermaston; (ii) AWE Burghfield; and (iii) AWE Cardiff?

Q16d. What was the full complement of staff for (i) AWE Aldermaston; (ii) AWE Burghfield; and (iii) AWE Cardiff, including vacancies, in each FY from 1987-88 to 1993-94?

Q16e. What plans are there for further job losses at the AWE sites at Aldermaston, Burghfield, and Cardiff; and what is the timetable for their implementation?

A16a.

	AWE(A)	*AWE(B)*	*AWE(C)*	*AWE(F)*
Supervisory, Administrative, Executive and Clerical	8	0	0	0
Specialists	81	1	0	0
Industrials—Craft	0	0	0	0
industrials—Non-Craft	28	0	0	0

The main area of recruitment continues to be in the areas of Safety and Information Systems. Additionally, there are a number of the specialist requirements which are related to the developing AGEX programmes—these include Design Mathematician Physicists with experience in laser technology, and those with experience in the field of Parallel Computing.

A16b. *Industrial Employees—AWE(A), AWE(B) and AWE(F)*

An offer related to a far-reaching Pay and Effectiveness Agreement (P&EA) and covering the period July 1994 to the end of December 1996 (a 2½ years deal) has been made to industrial employees at these sites. Although accepted by Burghfield industrial staff, it has been rejected by the other 2 sites. Negotiations are continuing.

Industrial Employees—AWE(C)

A Pay and Effectiveness Agreement was concluded at AWE(C) for industrial employees in 1994. This removed outdated bonus schemes, extended flexibility and, as a result of consolidation into basic rates, provided more beneficial calculations for overtime, sick pay and superannuation. The Agreement was signed in October 1994, and included a compensatory non-consolidated lump sum in recognition that an award would have normally been due from 1 July 1994. The package results in an overall increase to the total payroll of about 4.5 per cent in a full year. This is offset to some extent by compensating savings achieved by the removal of bonus scheme administrative costs.

Non-Industrial Employees (All sites)

An offer has been made covering all AWE non-industrial employees and this is currently being voted upon. The offer is linked to the introduction of a revised, and more flexible, pay structure; this includes the removal of the Civil Service performance pay arrangements so that a more appropriate AWE orientated system can be introduced, and measures designed to improve flexibility. If accepted, the package provides for a pay increase in 1994 of 2.8 per cent, with the capping of performance pay at a further 2.5 per cent, and no further review of pay until 1 January 1996.

A16c. The overall turnover of staff at AWE (including AWE Foulness) during the calendar year 1994 was 9.5 per cent. However, this included 306 voluntary redundancies which took place before 31 December 1994. The turnover by site was as follows:

(i) AWE(A) — 9.8 per cent
(ii) AWE(B) — 8.6 per cent
(iii) AWE(C) — 7.9 per cent
(iv) AWE(F) — 9.5 per cent

If the effects of the voluntary redundancy scheme are excluded, the overall underlying turnover for AWE as a whole was 4.6 per cent.

A16d. The concept of "complement" (ie the numbers the AWE was authorised to recruit up to) has not in practice been applied since the initial contractorisation phase which was implemented in October 1990. Prior to this the generally accepted overall manpower ceiling for AWE was considered to be in the region of 7,200. Subsequently, the manpower provision was more directly related to the financial provision made in MoD's planning processes and this was reflected in the manpower strengths achieved. These in turn, reflect the results of the Manpower Review carried out by Hunting-BRAE at the beginning of the contractorisation process and subsequent efficiency gains. For information, the headcount as at 31 December 1994 at AWE sites was as follows:

AWE(A)	4,632
AWE(B)	619
AWE(C)	402
AWE(F)	279

A16e. Information on further changes to AWE's future staffing requirements and the timescales involved are outlined in Answer 3 to the list of supplementary questions.

Q17. Has A90 produced its first viable plutonium pit yet? When are the remaining elements of A90 to enter red-commissioning?

A17. The first pit produced entirely in A90 is planned to be completed in late autumn 1995. A90 red commissioning of Bay 1 and Bay 2 started in March 1994. The complexity of the work and the higher standard of

safety documentation now being produced will prevent completion of commissioning until the end of 1995. Bay 4 red commissioning is planned to start in late 1995. As the Committee is aware, some facilities do not require to be subjected to the procedures entailed by red commissioning. Bay 3 and some equipment within other bays are in this category.

Q18. When is A91 now scheduled (a) to enter red-commissioning and (b) to enter service?

A18. A91 is scheduled to enter red commissioning in late 1996, and to enter service in spring 1997.

Q19. What has been the full cost to MoD of rectification of corrosion problems in A91?

A19. The cost of rectifying the corrosion problems in A91 is in the region of £15 million exclusive of value added tax.

Q20. What is the present likely estimate for the amount of time required to design and build facilities A89.3 and A89.4? And what is the present likely estimate for the cost?

A20. Buildings A89.3 and A89.4 are planned for the future preparation of solid radioactive waste for storage and disposal. Since the design of these facilities will depend upon long term disposal arrangements, there are currently no dates for commencement of planning work for these facilities and no detailed estimate of cost.

Q21. The Committee would be grateful for any update to the answer to Q26 on page 31 of the 1994 Report concerning the Programme of Safety Works.

A21. The Programme of Safety Works and the Safety Development Programme (SDP) planned by the operating contractor will need to be developed in conjunction with his further proposals in respect of the rationalisation of AWE facilities and with implementation of the recommendations of the Health and Safety Executive's report of October 1994. The detailed aspects of this wide ranging safety work will inevitably take some time to devise, but the process is being pursued vigorously. At the present stage of planning, an overall cost of the order of £250 million is envisaged.

Q22. The Committee would also be grateful for any update to the answer to Q31 on page 31 of the 1994 Report concerning the timetable and costs for decommissioning AWE facilities.

A22. * * *.

Q23. The Committee would be assisted by a note on the latest assessment by the Compliance Director of the performance of the contractor at AWE.

A23. AWE has continued to emphasise the importance of safety and has strengthened its safety structure. As stated in Answer 21, the SDP now includes actions to address the recommendations contained in the Health and Safety Executive's Report published in October 1994 and the Ministry of Defence is satisfied that the rationalisation proposals have taken account of the need to safeguard all aspects of the UK's nuclear capability.

The contractor is now working further to extend the registration of international quality standards and in January 1995 a new Accounting, Budgetary and Costing System (ABC) was installed which will facilitate the transition to incentivised contracting for the work of the Establishment.

Q24. The Committee would be grateful for a note on the contractor's plans for diversification at the three AWE sites at Aldermaston, Burghfield and Cardiff.

A24. Hunting-BRAE's contract with MoD required them to seek commercial work, where available, to ensure viability of facilities which have spare capacity and to reduce overhead costs. For some specialised work such as beryllium manufacture, explosives trials and the application of high technology, modest amounts of outside work have been found but it is a very small percentage of the Company's annual turnover. It is unlikely to increase significantly and has not been sufficient to counter the need for rationalisation of AWE sites to achieve efficiency.

Q25. What steps is AWE taking to ensure the safer and more efficient storage of intermediate level waste following the criticisms made by HSE in their report of 17 October 1994?

A25. Subsequent to the HSE Report, AWE has set in train a programme to sample stored drums, to inspect their condition and verify their contents. Depending on the outcome of this sampling programme, AWE will reassess the manner in which drums are stored in the short term with a view to improved access for condition monitoring. In parallel with this AWE are revising their forward programmes to consider whether additional storage facilities are needed and what design features might beneficially be modified.

Q26. In the light of some anxiety expressed by HSE over the age profile, and its implications for the safety experience and expertise of staff at AWE sites, what steps are being taken to prevent any possible future difficulties in this regard?

A26. Since Vesting Day, Hunting-BRAE has established a programme of recruitment into the Safety Directorate to address the skills imbalance and shortfalls. Over 30 staff have been recruited, many of whom are younger, but have the necessary experience.

An extensive programme of safety training has also been initiated for facility managers and line managers, and courses continue to be run on a weekly basis to help spread increased safety consciousness throughout AWE.

Q27. Given AWE's plans—expressed before the HSE report—voluntarily to meet the standards required for licensing under the NIA, would a Government decision to waive AWE's present exemption require any greater expenditure at the four sites than is currently planned? And if there was a short timescale compliance, would the need to upgrade facilities and procedures quickly have any effect on operational matters?

A27. The cost of removal of exemption has not yet been fully assessed in detail. However, initial estimates of the additional cost of licensing facilities at Aldermaston and Burghfield indicate that some 150 man years of AWE effort, at an extra cost of some £5 million, are required. In addition there will be HSE costs of some £1.75 million to achieve a licence and some £0.6 million per year thereafter to finance the oversight of the regime. A short timescale of achieve NII licensing might impact adversely on AWE's current SDP programmes. The MoD does not believe that a short timescale is warranted in the light of the HSE Report recommendations.

SUPPLEMENTARY QUESTIONS

Q1. Further to the announcement of 20 January, the Committee would be grateful for details of the nature of the work to be transferred to AWE Aldermaston from AWE Cardiff and from Foulness to the new Defence Science and Technology Agency, and also for information on which parts of the Burghfield site are to close, covering which activities.

A1. The way in which tasks are distributed between the various AWE sites is a matter for Hunting-BRAE. However, we understand that their intentions are as follows:

At Cardiff, the production of beryllium and depleted uranium components for Trident will be completed in 1997. Thereafter there will be a continuing need for a much smaller quantity of such parts for trials work. This need can be met by some small increase in the capability in these materials which already exists at Aldermaston. This will be achieved by moving process equipment and machine tools from Cardiff to Aldermaston. The cost of this is estimated to be about £4 million.

At Foulness, work on a number of laboratory-based activities will be moved to Aldermaston. Activities which have to be carried out in remote locations (eg disposal of explosive waste) will continue at the Foulness site, along with activities unconnected with the nuclear programme. The extra costs at Aldermaston are estimated to be £2 million.

At Burghfield, the situation is similar. Once manufacture of components for Trident are completed it will no longer be necessary to retain the same manufacturing capacity in a range of specialist materials (rubber, plastic, salts, high explosive and detonators). Such capability as is required in future can be met by marginal enhancement of existing facilities at Aldermaston. The cost of this is estimated to be about £11 million. This will mean that about half the Burghfield site will no longer be required, and this area will be decommissioned.

Q2. The Committee would be assisted by a note on the proposed timetable for the closure of sites and the transfer of work to other locations as well as the estimated costs of implementing these transfers.

A2. This is also a matter for the contractor, who will make the changes in a way which allows the programme to continue whilst organising the work in the most efficient way. We understand the contractor's intentions are as follows:

Cardiff will close in 1997, as soon as work on Trident is completed, by which time Aldermaston will be ready to take on transferred tasks. The transfer of the processes from *Burghfield* to Aldermaston will take place over the period up to 1999, depending on when work on Trident components is complete and when new facilities become available. The transfer of functions from *Foulness* to Aldermaston will take place over the period up to 1998, by which time the DSTA will have taken over responsibility for those functions remaining at Foulness.

The costs of these transfers are set out in the Answer to Supplementary Q1.

Q3. The Committee would be grateful for a breakdown of the job losses by location and for the timescale envisaged. How many of the job losses will be achieved by natural wastage? Will redundancy terms match those paid in the Civil Service?

A3. The 850 job losses (350 Cardiff, 300 Burghfield, 200 Foulness) will be incurred over the period up to 1999. The precise dates are for Hunting-BRAE to decide depending on progress with the Trident programme and completion of works at Aldermaston. Hunting-BRAE are determined that as few as possible of the job losses will result from compulsory redundancy; but precisely how many will depend upon a range of factors, such as the age profile of staff, how many staff transfer from one site to another and how many staff volunteer for redundancy. Civil Service terms will apply.

Q4. The Committee would also be assisted by a note on any plans for the disposal of sites closed.

A4. As a result of the rationalisation plans announced in January 1995 it is expected that the AWE Cardiff site will be closed and, assuming there is no alternative defence use, disposed of in accordance with normal Ministry of Defence practice.

The facilities will be decommissioned and the site will be cleared of contaminants such as ordnance, explosives and radioactive or microbiological material where they are found. The land would then be offered for sale, taking into account local authority views on the future use of the site.

3. Memorandum submitted by the Ministry of Defence responding to the Committee's questions on the Trident programme, following the Oral Evidence taken on 29 March 1995 (9 May 1995)

Q1. Witnesses agreed to provide a note—on a classified basis if necessary—on the nature of the defect in the propulsion system of HMS Renown and the estimated timescale for its repair.

A1. * * *.

Q2. Witnesses also agreed to provide a note setting out the changes in the constituent parts of the D5 missile costs and the effect of exchange rate fluctuations on the overall cost.

A2. A breakdown of the changes in the estimated overall cost of UK Trident D5 missiles since last year, at 1993–94 prices and exchange rate of £1=$1.44, is as follows:

	£ million
Reduction due to the effects of exchange rate variation on actual spend in 1993–94	–54.832
Reduction in number of guidance parts.	–20.461
Transfer of UK contribution to Strategic Weapons Facility Atlantic (SWFLANT) costs from acquisition to operations	– 6.833
Inclusion of UK share of contract incentive fees previously excluded by the US	+27.451
Increase in US estimates of missile costs	+11.164
Revision of in-year expenditure estimates	+12.492
Other minor miscellaneous revisions	+ 5.499
Overall net saving	–25.570

Q3. The Committee have asked for a note on the precise nature of co-operation with France in respect of non-nuclear experiments and on any plans for allowing other countries to use the testing facilities at Aldermaston.

A3. Given the expected demise of nuclear weapon testing the UK has been planning to enhance the alternative means of maintaining a nuclear warhead capability. As the two European nuclear weapon states in NATO, the UK and France have had long standing contact on a range of issues relating to nuclear forces including technical matters. Recently there have been technical discussions between the UK and France on a number of aspects, including:

- — hydrodynamics experiments
- — laser plasma physics
- — computer simulation
- — possible arrangements for peer review

These discussions are at an exploratory stage and have involved a number of reciprocal visits. It is too early to say how they will develop.

Apart from this and our long established relationship with the US, access of other countries to Aldermaston facilities has not been considered.

Q4. The Committee would be grateful for a note on the anticipated date for the establishment of a contract with Devonport Management Limited and the scheduled timetable for the construction of Trident refitting facilities. The Committee would also be grateful for confirmation that the original cost estimate, contract terms and scheme of works remain unchanged.

A4. A response to the Invitation to Tender for Phase 2 (design and build) of the nuclear refitting facilities at Devonport was received from Devonport Management Limited late last year and has been subject to clarification of a number of important issues with the Company. The Invitation to Tender has been reissued to the company in the light of these discussions and a response is expected during May. While this process is under way it would be inappropriate to speculate on the outcome. As was mentioned in evidence, we hope to conclude negotiations and place a contract before the end of this Summer. It remains the aim that construction will commence during Summer 1996 and complete around the turn of the Century.

Q5. Following the discussion on the rationalisation of AWE sites (Qq 1553–62) the Committee has asked for a note on how the savings accruing from the announced closures are to be distributed between MoD and the contractor.

A5. The contractor will be tasked to manage and implement that part of the rationalisation programme which falls within the term of his management contract by way of a project contract. This project contract will be funded by MoD and be subject to a target cost incentive arrangement, in common with other project contracts placed with Hunting-BRAE. Thus, if the contractor manages the task in a cost effective and efficient manner he will receive a share of any cost underrun under the target incentive arrangement. Conversely if costs exceed the target, the contractor will contribute to any cost overrun.

Target costs for other projects contracts will take account of the anticipated effects of the rationalisation programme.

4. Memorandum submitted by the Campaign for Nuclear Disarmament on the Progress of the Trident Programme (3 March 1995)

1. Since the Committee's last report on the *Progress of the Trident Programme* there have been a number of developments relating to the United Kingdom (UK) Trident programme including the first operational patrol of HMS *Vanguard.*

TRIDENT'S ROLE AS A STRATEGIC AND A SUB-STRATEGIC DETERRENT

2. "It is difficult to be confident that an intended deterrent would work in the way intended, in the absence of an established nuclear deterrent relationship. Would the threat be understood in the deterrent way in which it was intended; and might it have some unpredictable and perhaps counter-productive consequence? Categoric answers to these questions might be hard to come by, and in their absence the utility of the deterrent threat would necessarily be in doubt." (Secretary of State for Defence, Malcolm Rifkind, November 1993)

3. When the UK decided to procure the Trident D5 system in the 1980s, the principal threat from nuclear weapons was that they would be used in an East-West conflict. Trident was intended to provide a UK independent strategic nuclear capability to deter the Soviet Union.

4. Now that the Cold War is over, "the proliferation of nuclear weapons presents one of the most serious threats to international stability"[1]. Trident's role has been officially adapted to providing a minimum deterrent to an unspecified "potential aggressor". In addition to this strategic deterrence, Trident is intended to fulfil a sub-strategic deterrent role defined as the "capability to undertake nuclear action on a more limited scale in order to demonstrate our willingness to defend our vital interests to the utmost, and so induce a political decision to halt aggression without inevitably triggering strategic nuclear exchanges"[2]. The role of this sub-strategic nuclear capability "in future interventions in Third World countries would be to neutralise any threats of mass destruction being made by a rogue country"[3].

5. The UK offers Negative Security Assurances (NSAs) to non-nuclear weapon state signatories to the NPT in order to promote confidence, "endeavouring to remove the fear that nuclear weapons might be used to coerce a non-nuclear state, and thereby removing a motivation to proliferate"[4]. Using unadapted Trident warheads with a yield of 100 kilotons as a "more limited" nuclear capability, may be seen as an unnecessarily aggressive nuclear posture, undermining confidence of non-nuclear states in their security. Indeed the sub-strategic role was originally interpreted as "the perceived need to counter nuclear-armed countries in the Third World, which would not justify the use of Trident"[5]. Confidence is further undermined by UK refusal to rule out the first use of its nuclear weapons and by caveats in UK NSAs.

6. Even the Secretary of State for Defence has raised reservations that "in contrast to the situation in Europe, it is difficult to see deterrence operating securely against proliferators" and that "the process of achieving a new stable relationship of nuclear deterrence is a process of evolution which unavoidably involves risks, where the consequences of failure could be catastrophic"[6]. With these uncertainties, nuclear deterrence cannot be regarded as a panacea. It is thus crucial that the UK takes all steps at its disposal to strengthen the international non-proliferation regime.

TRIDENT AND THE NUCLEAR NON PROLIFERATION TREATY (NPT)

7. "Trident's accuracy and sophistication in other respects does—and was always intended to represent a significant enhancement of the UK's nuclear capability." (House of Commons Defence Committee, May 1994)

8. On 17 April 1995, the NPT Conference will begin in New York, with increasing dissatisfaction amongst non-nuclear weapon state signatories at the lack of progress made by the nuclear weapon states on their treaty obligations. Non-compliance with Article VI of the Treaty has already emerged in the NPT preparatory committee meetings as a major stumbling block to achieving consensus on the future of the NPT.

9. The UK believes that the NPT "has been the cornerstone of the international non-proliferation regime". However, it appears unwilling to fulfil its commitments under Article VI. Although *SDE94* welcomes the Chemical Weapons Convention as a "major step forward in enhancing world security"[7], the UK has no plans for a similar convention to ban nuclear weapons, believing the NPT to be sufficient[8].

10. In November 1994, the UK abstained on a resolution to the United Nations First Committee, tabled by Japan, calling on all states to accede to the NPT, to fully implement their commitments in the field of disarmament

[1] Malcolm Rifkind, "UK Defence Strategy; A continuing role for nuclear weapons?", 16 November 1993.
[2] *Statement of the Defence Estimates 1994 (SDE94),* HMSO, Cmnd 2550, April 1994.
[3] Lawrence Freedman, "Set to sail without a helmsman", *The Independent,* 5 March 1992.
[4] Malcolm Rifkind, "UK Defence Strategy; A continuing role for nuclear weapons?", 16 November 1993.
[5] Christopher Bellamy, "Anglo-French deal likely for missiles", *The Independent,* 27 December 1990.
[6] Malcolm Rifkind, "UK Defence Strategy; A continuing role for nuclear weapons?", 16 November 1993.
[7] *SDE94,* page 21.
[8] House of Commons, *Official Report,* 20 February 1995, col 12.

and non-proliferation and to pursue "nuclear disarmament with a view to the ultimate elimination of nuclear weapons". It is difficult to see how this stance by the UK can encourage the universal accession and compliance with the NPT which the UK advocates.

11. With President Clinton and President Yeltsin setting a target date of March 1995 for ratification of the START2, the nuclear weapons of the three smaller declared nuclear powers are becoming more significant. The *Independent on Sunday* reports that the UK is under pressure from the US to enter Trident into a new round of arms reductions[1].

12. The UK is unwilling to enter Trident into nuclear arms control negotiations as it sees Trident as a "minimum" deterrent. As Mr Nick Witney has explained to the Defence Committee, "this implies you are operating close to the margins of credibility in what you can deploy and I do not think we would wish to find ourselves constrained at this stage by moving into an arms control process[2]. The UK cannot argue that it is maintaining only a minimum deterrent, when it is introducing a system which can reach six times as many targets as its predecessor. In the run up to the NPT Conference the UK must do mob to demonstrate its commitment to negotiate in good faith for a cessation of the nuclear arms race. There is no reason why the UK should not announce that it is now ready and willing to enter Trident into disarmament negotiations.

Conclusion

13. In a world where nuclear weapons have "reduced salience"[3], the UK's long term security interests may be better served by a more radical shift in policy—from dependence on an unsure deterrent to provide the "ultimate guarantee of this country's security"[4] to a strengthened non-proliferation regime based on the total elimination of nuclear weapons.

14. Despite changes in UK nuclear doctrine in response to the end of the Cold War, there has been no thorough examination of UK nuclear policy since the Defence Committee's reports on *Strategic Nuclear Weapons Policy* of 1981–82. CND calls on the House of Commons Defence Committee, as the all party, elected body best equipped to conduct such a study, to initiate a comprehensive inquiry into UK nuclear weapons policy.

UPDATE ON SAFETY OF UK NUCLEAR WEAPONS

CSB Faslane and RNAD Coulport

15. "The system remains on time and within budget to enter service from the mid-1990s" *(Report on Trident by the Ministry of Defence,* 20 January 1994)

16. On 27 July 1994 the Comptroller and Auditor General reported that the Trident Works Programme at Faslane and Coulport had overspent by 72 per cent—£800 million. Although the explanation given by MoD for this overspend is that facilities were "required very quickly" for Trident and that "during the course of the programme nuclear safety standards were very significantly tightened"[5], 40 per cent of the Trident Works Programme is not attributed to Trident and thus 40 per cent of this Overspend is funded from the general Defence budget[6].

17. The original target date for operational readiness of the full Trident works programme was July 1992[7]. As recently as 2 November 1994 MoD "intended" that "all Trident works facilities will have achieved unlimited safety clearance before HMS *Vanguard* goes out on operational patrol"[8].

18. On 22 October 1994, HMS *Resolution* was finally decommissioned (after postponement of a decommissioning ceremony scheduled for July), leaving only two Polaris submarines, HMS *Renown* and HMS *Repulse* in service. Following an extended refit from October 1987 to December 1992, HMS *Renown* returned to operational patrol on 22 August 1993. However, HMS *Renown* has not been on patrol since she returned to Faslane on 16 June 1994 amidst reports of reactor problems. MoD should explain what is wrong with HMS *Renown* and what steps have been taken to ensure her future safety. MoD should clarify whether the decommissioning of HMS *Resolution* was postponed in order to Prevent gaps in the UK's nuclear deterrent patrols and what are the safety implications of sending the UK's oldest Polaris submarine on operational patrol after she was due for decommissioning. MoD should give an assurance that safety is its priority and that retirement of Polaris submarines will not be delayed again, especially in view of delays to HMS *Vigilant's* in service date.

19. MoD should also clarify why HMS *Vanguard* went out on her first operational Patrol on 13 December 1994[9], before full safety clearance for Trident facilities including the Trident shiplift had been achieved[10]. The

[1] Stephen Castle and John Carlin, "US urges Britain to ditch Trident" *Independent on Sunday,* 19 February 1995.
[2] *Progress of the Trident Programme 1993*, Minutes of Evidence, 16 June 1993, page 16, Q1584.
[3] Malcolm Rifkind, "UK Defence Strategy; A continuing role for nuclear weapons?", 16 November 1993.
[4] *SDE94,* page 33.
[5] House of Commons, Committee of Public Accounts (CPA), *Ministry of Defence: Management of the Trident Works Programme,* Minutes of Evidence, 2 November 1994, HC 741-i of Session 1993–94, page 1.
[6] Report by the Comptroller and Auditor General, Ministry of Defence: Management of the Trident Works Programme, Report 621, 27 July 1994, para 2.27.
[7] *ibid,* para 1.9.
[8] *op cit,* CPA, *Ministry of Defence: Management of the Trident Works Programme,* page 11.
[9] From observations of HMS Vanguard at Faslane and Coulport by Faslane Peace Camp and Scottish CND.
[10] House of Commons, *Official Report, 23* November 1994, col 147.

Trident shiplift, which was supposed to be ready to support HMS *Vanguard's* Sea trials, has overspent by 129 per cent and is two and a half years behind schedule. **MoD should explain how it intended to cope should any incident occur on patrol which required HMS *Vanguard* to be lifted out of the water for repair's or maintenance.**

ATOMIC WEAPONS ESTABLISHMENTS (AWE)

20. "MoD again assured the Committee that the warhead programme was on schedule, and, more importantly, that production in the old facilities had increased." (House of Commons Defence Committee, *Progress of the Trident Programme,* 1994)

21. Last year in evidence to the Defence Committee, MoD confirmed that "if the programme was not to slip—it follows that production must have increased in the old facilities, A1.1 and A45"[1].

22. On 17 October, the Health and Safety Executive (HSE) found that "a number of older facilities did not meet current design standards . . . standards did not come up to those found elsewhere in high hazard industries, including the nuclear industry"[2]. The HSE review also found weaknesses in planning for emergencies, ensuring equipment was safe, managing radioactive waste, monitoring risks and training in health and safety.

23. During an inspection of Aldermaston: "HSE inspectors found inadequate precautions were being taken to prevent a runaway nuclear chain reaction. It immediately issued a 'prohibition notice', stopping operations in the A45 area of the plant where highly enriched uranium is machined into the shapes suitable for nuclear weapons."[3]

24. The recommendation by HSE that the Secretary of State for Defence remove AWE's immunity from licensing under the 1965 Nuclear Installations Act, is accepted in principle by the Government. However, what are the implications of removing immunity from AWE given that, "if the site was a civil nuclear facility they (HSE) would not grant it a licence to operate"[4]?

25. In April 1994, Reading Borough Council conducted a Community Inquiry into safety at AWE Aldermaston, chaired by Helena Kennedy QC. The Inquiry concluded that "AWE, like many other British Government institutions, seem to be suffering from a very British disease—the need to cover even its most mundane activities in a cloak of official secrecy . . . this is very much a remnant of the Cold War mentality which is being perpetuated by the Ministry of Defence in London". The report continues: "people have contracted fatal illnesses for which they and their families have received no satisfactory response, waterways are threatened with pollution and the environment is seen to be constantly at risk . . . a full public inquiry into the health, environmental and safety aspects of AWE Aldermaston and Burghfield is long overdue."[5] Public concern remains high about whether production needs have been put before safety requirements at AWE.

NUCLEAR WARHEAD CONVOYS

26. Last year, MoD gave a list to the Defence Committee of unscheduled stops made by Truck Cargo Navy Duty (TCHD) Mark II vehicles due to faults and breakdowns since their entry into service However, information concerning unscheduled stops as a result of accidents is excluded from replies to parliamentary questions[6], (eg the accident on 11 August 1993 near Alnwick which resulted in closure of the A1 for 3 hours). The 1992 Oxburgh Report recommended that the nuclear weapon safety champion be responsible for receiving, maintaining, analysing and appropriately disseminating records of such incidents[7]. This information should be made available to Parliament.

27. MoD currently has a team available to visit local councils which reassures the public that HSE have found that a convoy accident is "not easily foreseeable" and that Oxburgh found that MoD's approach to safety and security of warhead transport was "sensible and practical". However, the HSE report on AWE "did not examine arrangements for emergency preparedness in the event of an accident during the transport and storage of weapons by MoD"[8] and Oxburgh was only able to examine "parts of the transport and weapon handling system"[9]. It is time that an independent and comprehensive assessment of the safety of nuclear warhead transportation was carried out.

5. Memorandum submitted by Nukewatch on the Safety of Transport of Nuclear Warheads by Road (16 March 1995)

At the quarterly meeting of National Nukewatch UK on 11 March, we discussed the risk of a serious accident involving a nuclear warhead carrier in the light of the accident on Thursday 9 March caused by mechanical failure of a fat-bed, articulated transporter caring nuclear waste on the M5 J14.

[1] *Progress of the Trident Programme 1994,* Minutes of Evidence, page 12, Q1216.
[2] Health and Safety Executive, *The Management of Health and Safety at Atomic Weapons Establishment Premises,* HSE Books, Part 1, page vi.
[3] Tom Wilkie and Susan Watts, "Safety 'lapses' at nuclear weapons plants attacked", *The Independent,* 18 October 1994.
[4] Paul Brown, "Nuclear plant warned after spill caused Trident halt", The Guardian, 18 October 1994. Similar reports in the Daily Telegraph and the Independent.
[5] Helena Kennedy OCR *Secrecy versus Safety: The findings of the AWE Aldermason Community Inquiry,* 18 April 1994, pages 60-61.
[6] House of Commons, *Official Report,* 31 March 1994, col 994.
[7] Sir Ronald Oxburgh, "The Safety of UK Nuclear Weapons", July 1992, para 3.3.5.
[8] Health and Safety Executive, *The Management of Health and Safety at Atomic Weapons Establishment Premises,* HSE Books, Part 2, page 145.
[9] Sir Ronald Oxburgh, "The Safety of UK Nuclear Weapons", July 1992, para 3.5.2.

You will be aware of the serious accidents and many mechanical failures of warhead carriers over the years. In our view, the risk of a serious accident is now reaching a critical level. Despite new guidelines and consultations, nothing has improved and the dangers have not been addressed To illustrate the extent of the problems please see Convoy Report Appendix Nukewatch recommends that The Select Committee on Defence ask the Ministry of Defence to:

(a) reduce the speed of the nuclear warhead convoy to 20mph;

(b) close the road ahead for one mile;

(d) implement whatever implications this has for routes and overnight stops;

(e) give prior notification of convoy movements to local Authority EPOs;

(f) clearly mark each carrier with Radiation Warning Symbols.

Nukewatch's position is that no further nuclear warheads should be-produced or transported from the AWE, and that the above recommendations apply to warhead convoys returning weapons to AWE for decommissioning. However, so long as nuclear weapons continue to be carried on British roads, our recommendations apply to all loaded warhead convoys at all times and in all places.

ANNEX 1

CONVOY REPORT

24 February–10 March 1995

Transport of Trident Warheads to AWE Coulport/Polaris Warheads to AWE Burghfield

FEBRUARY 1995		
24.2.95	15.00	Convoy of 5 Warhead Carriers (TCHDs) enters AWE Burghfield during a base alert (1) in the High Security Area requiring the attendance of Berks. Fire Service and evacuation of workers for 30 minutes.
MARCH 1995		
1.3.95	07.30	Convoy of 5 TCHDs leaves AWE
	08.00	**Convoy breaks down almost immediately (2)** on M4 J9/10 Eastbound in rush-hour
	11.25	Convoy arrives RAF Wittering
2.3.95	10-ish	Convoy leaves Wittering
		Convoy arrives Albermarle Barracks
3.3.95		Convoy leaves Albermarle
	13.55	M74 J8 Convoy Fire tender goes ahead to assist **car transporter in accident/fire (3)**
		Police straddle all northbound carriageways to hold back the traffic and convoy
		Convoy goes over weight-restricted Kingston Bridge, Glasgow (4)
		Convoy arrives RNAD Coulport
		Trident Warheads unloaded. Two TCHDs loaded with Polaris warheads
5.3.95	02.00	**Peace ♀ ♀ enter and remain for 2 hours undetected on base Special Area (5)**
8.3.95		Convoy of 5 TCHDs (3 empty) leaves RNAD Coulport but avoids Glasgow
		Convoy arrives Albermarle Barracks
9.3.95	09.30	Convoy leaves Albermarle
	10.30	**Convoy breaks down on A68 near Consett (6)**
	13.40	**Convoy stuck in dense traffic on A1 at Aberford, East of Leeds (5 mph) (7)** where a wide load had been pulled over. One hour delay
		To reach RAF Wittering by dark & within driver hours, **convoy travels at 55 mph (8)**
		Convoy arrives RAF Wittering
		Convoy of 3 TCHDs leaves Wittering
10.3.95	09.15	Convoy arrives AWE Burghfield
13.3.95	13.10	Two TCHDs leave AWE unescorted and **travel at 60 mph (9)** on M4 and M25

Note This Report covers **just one** Trident/Polaris warhead transport operation
Seven **(2–8)** incidents involve nuclear weapons.
Two **(1 & 9)** incidents involve unladen TCHDs.

6. Extract from a memorandum submitted by the Ministry of Defence on the Defence Equipment Project Report (12 May 1995)

SONAR 2054

Sonar 2054 is the sonar system designed specifically for Vanguard Class SSBNs, and is the first fully integrated sonar suite to be introduced into service. The programme status is adjudged at "major weakness" because of problems which came to light during initial contractor sea trials (CSTs). These trials were the first opportunity to test the system fully in its working environment. The most significant problem encountered was with the operation of the towed array handling system where deployment and recovery difficulties have been experienced. As a

consequence the handling system is not fully operational at present and interim arrangements are being used. A remedial programme to recover the full system capability is, however, making good progress. None have precluded the use of Sonar 2054 during operational deployment.

Memorandum submitted by the Ministry of Defence, responding to the Committee's further questions on Nuclear Safety Requirements in relation to Devonport following the Oral Evidence taken on 29 March 1995 (3 July 1995)

Q1. It would be helpful to have a note as offered on the effect of recent changes in nuclear safety requirements on the proposed programme of costs at Devonport, identifying separately the impact on (a) Trident refit plans (b) SSN refit plans and (c) the 1993 arrangements for future surface ship refits.

A1. As announced by Minister (DP) on 17 May, (Col 229), increasingly stringent nuclear safety requirements have necessitated some improvements to existing submarine docking facilities at both Devonport and Rosyth. The full scope of this work has not yet been established and as a result it is not possible to estimate accurately the additional costs involved at Devonport or the timescale for their completion.

The requirement to carry out works on the docking facilities for nuclear submarines, together with an increase in the time required in dry dock by such submarines, have combined to create a backlog in the nuclear submarine refitting programme. Ways of limiting the disruption caused are currently under consideration, involving discussions with both dockyard companies. One possibility is to extend nuclear refitting work at Rosyth beyond the 1997 date at which it was previously planned to cease. The implications of this on the programme of allocated surface ship refit work at Rosyth, announced in July 1993, is a factor that will form part of the work now underway. Until the assessment is complete (expected to be by the end of Summer) we will have no detailed indication of the likely impact on costs for either SSN refit plans or the 1993 arrangements for future surface ship refits.

The current difficulties affect only existing nuclear submarine docking facilities. They will have no direct impact on the planned provision of refit facilities for Trident submarines which will take full account of the more stringent nuclear safety requirements from the outset.

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