

Memorandum from Dr Jeremy Stocker

INTRODUCTION

1. The following commentary on Cm 6994 is forwarded in addition to evidence previously submitted to the Defence Committee, and published in HC 986 Ev.100-103. It draws on research undertaken for the author's forthcoming IISS Adelphi Paper *Nuclear Deterrence in the United Kingdom*. The IISS intends to supply members of the Committee with advance copies of the paper in advance of the Commons debate in March.

2. The current debate has often been conducted in terms of a *Trident* replacement. In fact, as the White Paper makes clear, the issue is *maintenance* of the deterrent, requiring some expenditure in order to retain the existing capability. Some components need replacement (not *Trident* itself), others some refurbishment and upgrade.

3. One could therefore question why a full-blown policy debate is needed at all. But *Trident* was being procured just as the Cold War was ending. There were no major procurement decisions then required, which might have necessitated a comprehensive review of UK nuclear weapons policy. Though all other nuclear systems had been eliminated by 1998, little change was made to *Trident* other than the introduction of an ill-defined 'sub-strategic' capability. No comprehensive review of post-Cold War deterrence needs has been conducted, certainly not in public, so now may be as good a time as any.

RETENTION OF THE DETERRENT

4. The White Paper makes a compelling case for retention of the UK's strategic nuclear deterrent, principally on the basis of future uncertainty in a world in which nuclear weapons continue to exist. Like previous Government statements, it pays lip-service to eventual nuclear disarmament, but the decision to renew the current capability makes it plain that the Government does not expect this aspiration to become a reality within the foreseeable future. The recognition that nuclear weapons will remain with us is both sensible and inevitable: a nuclear-free world is not currently on offer.

5. Para 3-4 says the focus is on preventing nuclear attack. The White Paper does not say what role, if any, the nuclear deterrent

might have in deterring the use of other WMD, noting that nuclear weapons are the *only* WMD the UK possesses. Nuclear weapons also have a general war-prevention role as their presence tends to induce restraint. This also is not acknowledged in the White Paper. It does discuss their role in relation to state-sponsored nuclear terrorism in a way that is sensible and appropriate. Given the practical difficulties inherent in acquiring or assembling a nuclear device, future nuclear-armed terrorism is much more likely than not to have state support.

DETERRENCE

6. Section 3 *Nuclear Deterrence in the 21st Century* says more about the requirement for deterrence than about how deterrence might actually work. The White Paper does re-iterate the UK's policy of 'studied ambiguity' as to how and when nuclear weapons might be used. Given the 'To Whom It May Concern' nature of today's deterrence needs this is to some extent inevitable. In a particular crisis, however, the Government might need to be a lot more specific, and in order to do so needs to have thought-through deterrence mechanisms in advance.

7. The British approach to nuclear deterrence has always been based on deterrence by 'punishment': the threat of retaliation, the cost of which would outweigh the benefits of the original action. The other approach to deterrence is 'denial', the ability to defeat the action itself, so demonstrating its futility in the first place. The White Paper makes a passing reference to missile defences as potentially reinforcing deterrence, but gives no further indication of current MoD thinking in this area.

8. The White Paper does not deal with some fundamental challenges to deterrence in the 'second nuclear age.' Absent an overwhelming threat such as the Soviet Union, the credibility of a nuclear response to limited aggression must be in doubt. In particular, opponents in future crises may have more at stake (including regime survival) than do western powers. The latter may have 'vital interests' involved but not national or regime survival. Regional challengers may have fewer scruples when contemplating civilian casualties, and may be willing both to inflict and to suffer greater costs than are western governments. The latter need to have thought-out very carefully the risks of being self-deterred in the face of a more determined and less scrupulous opponent. These potential difficulties with retaliatory deterrence provide a strong imperative towards deterrence by denial capabilities - defences.

NON-PROLIFERATION

9. Cm 6994 provides a brief summary of the UK's non-proliferation efforts, which are considerable. Curiously, Annex A on the subject makes no mention of the most important instrument, the Non-Proliferation Treaty (NPT), though it is in the main body of the White Paper and in an accompanying fact sheet. The manner of presentation suggests it is included to demonstrate the UK's non-proliferation virtue in order to soften the blow of nuclear weapons renewal. But deterrence and non-proliferation are not incompatible: they seek to address the same problem - proliferation - by different means.

10. The Government is right to assert that retention of nuclear weapons is not 'illegal'. It is also true that the effects on others of a British 'example' in giving up its weapons would be slight, if at all discernable. Possession of nuclear weapons is above all a strategic matter, in which law and morality have at most marginal relevance.

DETERRENT ALTERNATIVES

11. Annex B of the White Paper contains an assessment of four alternative configurations for a future deterrent capability. It is no surprise that it concludes the present type of deterrent better meets the UK's needs than the other options considered. Probably the most credible or attractive alternative would be submarine-launched cruise missiles, which is not considered as one of the four options. Cruise missiles are examined elsewhere, however, and the White Paper correctly concludes that ballistic missiles offer several advantages over cruise. Interestingly, Section 4 introduces the requirement to 'deter threats anywhere in the world', which implies that the platform and delivery system in combination must be able to *reach* anywhere in the world, which only a submarine-based ballistic missile can do.

THE WARHEADS

12. The 1998 SDR reduced the number of warheads in each submarine to 48 from a previous ceiling of 96, though in fact no more than 65 were actually ever carried. '48' is now replaced by 'up to 48', introduced to allow greater flexibility. Exactly 48 allows for relatively few permutations of multi-warhead strategic and single-warhead ('sub-strategic') missiles.

13. The existing warhead can be maintained into the 2020s. Yet to be determined is whether it can then be extended in service or whether a new warhead will be required, for which additional

spending at AWE Aldermaston will be needed. The White Paper does not explain why it might not be possible to re-manufacture warheads to the present design, using the existing stockpile of fissile material.

14. There is no mention in the White Paper of the 'sub-strategic' role for *Trident*. This may be because any use of a nuclear weapon, of whatever size, would be very 'Strategic'. Instead Cm 6994 makes reference to a range of yields for the warhead, though provides no more details. It is widely conjectured that the *Trident* warhead's full fusion yield is about 100 kilotons, the same as the US W-76 warhead on which it based. By detonating only the boosted or unboosted fission primary, yields of about 10 or one kiloton respectively could be obtained. If a new warhead is to be developed in the future, the opportunity could be taken to provide a range of (probably reduced) yields to increase operational flexibility. A further gesture could be made in the direction of disarmament by declaring the size of these yields.

15. The White Paper does not mention the American Reliable Replacement Warhead (RRW) programme, though a new warhead for *Trident*, if required in the 2020s, would have much the same requirements. The US has not designed a new nuclear warhead any more recently than has the UK, and there are signs that future cooperation in warhead design would be welcomed by both countries.

16. No operational justification is offered for the 20% reduction in 'operationally available' warheads. This measure may have more to do with diplomatic and domestic political gestures than the requirements of a 'minimum' deterrent, the minimum size of which has been repeatedly reduced since the end of the Cold War.

THE MISSILES

17. It has been generally assumed that the submarines are the driving factor behind current decision timescales. However, the White Paper tells us that a decision on whether to participate in the *Trident* life-extension programme is required in 2007. This may be for programming or contractual reasons in the United States. Whilst no firm orders for submarines will be required for some years, it appears that a commitment to the life-extended *Trident* D5A is required now. In that sense it *is* the missiles driving current timescales.

18. The life-extension programme will take *Trident* through until 2042, when the last of the US Navy's existing *Ohio*-class submarines will be decommissioned. At that point the RN's new boats will be between 14 and 20 years old, with many years'

service remaining. The White Paper makes clear that the US Government has already given an undertaking that any successor to *Trident* (which the US Navy needs from 2029 onwards) will be made available to the UK, and that it will be compatible with the existing *Trident* launch system. This would appear to reduce the risk otherwise inherent in putting submarine and missile procurements on different timescales. *Trident* already meets likely future requirements, though greater accuracy would expand targeting options. It is therefore probable that the US Navy's replacement for *Trident* will look very like *Trident* and may well be an updated derivative of *Trident* - perhaps a D5B or D6 variant.

19. The published Exchange of Letters between Tony Blair and George Bush contains one possibility not mentioned in the White Paper. This could be a further *Trident* life extension for UK purposes to take the missiles up to the out-of-service dates of the new submarines (at least 2053). Such a plan would repeat the experience with *Polaris*, which was kept in RN service for several years after it had been retired by the USN. This would put the platform and delivery system back on the same timescale, but at the cost of getting out of step, once again, with the Americans. The *Polaris/Chevaline* experience demonstrated the technical risks and financial costs of doing so. A decision on eventual *Trident* replacement will probably be required in the 2020s.

20. It is known that the submarine on deterrent patrol usually deploys with fewer than the maximum 16 missiles, though the Government declines to confirm how many (widely believed to be about 12). This is surprising, in view of its greater openness in relation to the number of warheads carried. Objectively, the latter is the more sensitive subject.

21. *Trident* D5 can carry up to 12 Mk4 re-entry vehicles (RVs). The White Paper does not say what use, if any, is made of the spare capacity. However, it is likely that in the full multi-warhead configuration at least, a 'lean/rich' mix of inert and live RVs provides additional 'bodies' to defeat missile defences - which only Moscow has. It is difficult to conceive of an operational requirement for decoys in a single-warhead, reduced-yield configuration, so it may be that such missiles, with a lighter payload, have an extended range, thereby meeting the White Paper's requirement for a world-wide capability.

22. The cost of British participation in the life-extension programme is put at £250 million - £5 million per missile - which makes spending on *Trident* itself much the smallest element of the Government's future plans.

23. The White Paper explains that the *Vanguard*-class SSBNs cannot be retained in service as long as the equivalent (but very different) US *Ohio*-class. The US Navy plans to replace the latter between 2029 and 2042. The *Vanguards* can only be kept for a further five years beyond their planned service lives of 25 years. From the dates quoted in the White Paper it is apparent that the 'clock started ticking' when the boats were launched and not, as widely assumed, when they entered service. Even with a five-year extension *Vanguard* herself will be decommissioned in 2022. Cm 6994 does not actually state that the five-year life-extension will be undertaken, but that is the implication to be drawn from the timescales set out.

24. If the submarines are to be replaced anyway one might question why additional money should be spent giving the present class a modest life-extension first. The decision to do so may be driven by the time needed to design and build replacements, and to complete the delayed *Astute*-class SSNs first. If the planned 22-month 'drumbeat' of submarine construction is adhered to, the last of the planned seven *Astutes* will not be completed until around 2020.

25. The Government intends to study whether the Continuous At-Sea Deterrent (CASD) can be maintained with just three SSBNs. It would generate a modest cost-saving and also provide a further disarmament gesture. However, there must be some operational risk and a danger of undermining the whole credibility of the deterrent by repeated pruning at the margins. The Government's view that it is important to maintain the CASD and not opt for a more 'virtual' form of deterrent is entirely sensible.

26. Also left unanswered is the question of how many missile tubes the new submarines will carry. Not all the present boats' 16 tubes are used, and the planned buy of missiles was reduced by the SDR in 1998. 12 tubes would seem to be a sensible figure, allowing for a varied and variable number of warheads per missile. Fewer than 12 might compromise future flexibility, especially if a significant number of single-warhead missiles was to be carried to address 'limited' nuclear or other WMD threats.

27. The cost of the new submarines seems very high (£11-14 billion for a four-boat force). The present four boats cost (at 2004/05 prices) a little under £6 billion, though in the House of Commons the Prime Minister (4 Dec 2006 Col.34) stated it was £14 billion (which was the cost of the entire *Trident* programme). These costs may reflect experience with the *Astute* programme and the fact that with a smaller overall submarine force individual units cost more. There is also a determination in the MoD not to underestimate

costs as any later over-runs would be at the expense of the rest of the equipment programme.

28. The respective futures of the SSN and SSBN forces are closely bound-up together, sharing as they do the same Submarine Industrial Base (SIB), operating and maintenance bases and other support, training and command infrastructures. The SDR process identified an operational requirement for 14 SSNs, though the number had already been reduced to 12. Treasury intervention meant that only 10 were authorized, and this was subsequently reduced to eight in the 2003 Defence White Paper. The current *Astute* programme is for just seven boats, though 12 were originally planned. If only 3 SSBNs were to be built, that could leave the UK with just 10 nuclear-powered submarines which may not be sufficient to sustain the SIB in the long-term. There is a view within the MoD that the new SSBNs might be the last nuclear-powered submarines to be built in Britain.

29. The Exchange of Letters includes the intention to collaborate on aspects of 'future submarine platforms'. The UK's first SSN HMS *Dreadnought* had an American-supplied reactor and more recently some US expertise was used to get the *Astute* programme back on track. Further Anglo-American cooperation could help mitigate concerns about the future of the SIB.

30. There are three design options for new SSBNs: an updated *Vanguard*; a 'stretched' *Astute* or a wholly-new design. The White Paper is a little vague on this. On page 25 it refers to 'changes to the design of the *Vanguard*-class,' but also says that 17 years are needed to design and build new SSBNs. An updated *Vanguard* would clearly not take that period of time. The MoD wants to maximize commonality with existing designs (mainly *Astute*). But the *Astute*-class has the same PWR-2 reactor as the *Vanguards* which was designed in the late 1970s and early 1980s. Building another class with the same propulsion system would mean having a 1980s reactor design still in service in the 2050s. This will probably dictate that a new design will be developed, possibly with all-electric drive, and why up to 17 years will be needed to bring it into service.

FASLANE

31. Hanging over the future of the deterrent is the 'Scottish Question'. The present devolution arrangements are viewed as unsatisfactory by large numbers of people, north and south of the border. Most of the infrastructure supporting the deterrent is located in England, principally at Barrow, Devonport, Derby, Aldermaston and Northwood. But the submarine operating base at Faslane is in Scotland. Unsurprisingly, the Scottish Question is

not discussed in the White Paper, but it was raised in the House of Commons the same day the White Paper was published (4 December 2006, Col.35). The future constitutional integrity of the United Kingdom has obvious implications for the nuclear deterrent. If the latter had to be relocated, the only viable base is Devonport, with a new RN Armament Depot probably at Falmouth. Relocation would clearly be expensive but might be self-financing as Scottish independence would end Westminster's funding of higher levels of public expenditure north of the border.

OPPORTUNITY COST

32. The total cost of £15-20 billion is a substantial sum in absolute terms, and of a scale with other major weapons procurement programmes. Spread over the life of the programme, it represents an average of about £1 billion per annum, though with higher expenditure in some years than in others. In relation to a) overall public expenditure and b) the intrinsic importance of the subject, the sums entailed are relatively trivial.

33. Of rather more concern is the opportunity cost of the *Trident* programme. The Government says in the White Paper that renewal of the deterrent will not come at the expense of conventional forces. It has been mooted that *Trident* life-extension could be funded out of a special contingency reserve, but the White Paper only goes so far as to say that decisions on spending for nuclear and conventional forces will be taken in this year's Comprehensive Spending Review. This will make the MoD nervous and the Navy in particular will worry about being reduced to the status of a nuclear-armed coastguard.

CONCLUSIONS AND RECOMMENDATIONS

34. The decisions the Government has made about the future of the UK's strategic nuclear deterrent are entirely sensible, though some difficult issues are still to be resolved. Renewal of the deterrent must not, in any way, be at the expense of conventional forces which are already substantially over-stretched and under-resourced.

35. Whilst it has set out clearly the way ahead for the deterrent, the Government has not produced a more comprehensive strategy for dealing with the dangers and risks posed by the proliferation of weapons of mass destruction. Nuclear deterrence is but one tool to be used to address this problem, one of the most acute challenges facing Britain. The country needs an all-encompassing approach which includes diplomatic tools (including but not only non-proliferation instruments), deterrent capabilities (not just

nuclear) and defensive capabilities (both active and passive). But the Government's plans for *Trident* are an important step in the right direction.

12 January 2007