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TAKEN BEFORE

defence committee

the future of the UK's strategic nuclear deterrent:

the strategic context

Tuesday 28 March 2006

MR PETER WHITEHOUSE and COMMODORE TIM HARE

DR ANDREW DORMAN, DR DOMINICK JENKINS, MR MALCOLM SAVIDGE and DR BRUNO TERTRAIS

Evidence heard in Public Questions 142 - 232

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Oral Evidence

Taken before the Defence Committee

on Tuesday 28 March 2006

Members present

Mr James Arbuthnot, in the Chair

Mr David S Borrow

Linda Gilroy

Mr Mike Hancock

Mr Dai Havard

Mr Adam Holloway

Mr Brian Jenkins

Robert Key

John Smith

Witnesses: **Mr Peter Whitehouse**, Corporate Director, Devonport Management Limited, and **Commodore (Rtd) Tim Hare**, gave evidence.

Chairman: Good morning. Thank you both for coming to give evidence. This is the third evidence session in the Committee's first inquiry into the strategic nuclear deterrent. As you know, this is one of a series of inquiries that we will be conducting during the course of this Parliament. The morning will be broken into two parts: the first will deal with technical matters and the second with the wider strategic issues. Before we begin the evidence I would like to take two declarations of interest.

Linda Gilroy: In my original declaration of interest I referred to various defence interests in my constituency. I would like to make it clear that DML lies on the edge of my constituency.

Mr Borrow: I have already mentioned, but I think I should repeat this morning, that I am currently undertaking an Industry and Parliament Trust fellowship with Thales UK.

Q142 Chairman: Are there are any other declarations of interest? That brings me straight to a point which Commodore Hare may wish to emphasise. While you are currently employed by Thales, is it correct that you wish to make plain that you are giving evidence this morning in a personal capacity, not as a representative of the defence industry in general or of Thales?

Commodore Hare: Yes, please.

Q143 Chairman: Do you want to add anything to that?

Commodore Hare: Only that I left the nuclear deterrent scene some four years ago when I retired from the Royal Navy having spent the majority of my working life there. Since then I have been working for Thales UK for four years but in an area not related to nuclear deterrence in any way at all. I am in the underwater systems division that makes sonar sets for the Royal Navy. Ironically, we make them for the SSBN force, but essentially we are an equipment supplier. I have not been engaged in any professional activity for Thales on anything to do with nuclear deterrence or the submarine programme.

Q144 Chairman: That is a very helpful introduction. Mr Whitehouse, would you care to introduce yourself as well?

Mr Whitehouse: I am a corporate development director with DML. I have responsibility for corporate strategy and as such take a great interest in matters relating to future deterrence and the way that that interacts with the current programme. I was one of the senior team that input a lot of information into the DIS work last year.

Q145 Chairman: I wonder whether we could begin by asking Commodore Hare to summarise what we currently have in the UK Trident system in terms of the main components and the technical capabilities that the system currently provides?

Commodore Hare: Our nuclear deterrent capability is vested in a single system, Trident, which has a dual capability. It has a full strategic capability and a sub-strategic capability. That system, which has been bought from the United States, is hosted in UK-designed and built nuclear submarines, called in the jargon SSBNs, of which we have four. Supporting that system is some shore-based infrastructure, command and control, which is UK-designed and procured. There are facilities at Faslane, Colport and Devonport which again are UK-procured and controlled. To go into a little detail on the Trident system itself, essentially it has four elements. There are the submarine platforms, which are UK-designed and built, in which the launcher, fire control and navigational sub-systems of the Trident system are hosted. The missiles which are part of the Trident system are procured from the United States. There is a pooling arrangement whereby the United Kingdom has bought 58 Trident missiles. At various times in a submarine's life, normally after refit, it has to deploy to Kings Bay, Georgia, to outload itself with the appropriate number of missiles from the pool. I would like to emphasise that the UK has bought them, but through expediency and a significant saving in the original Trident costs - something like £3.8 billion, I think - it was decided to use that pool

in the United States rather than store and support the missiles in the UK. In my view, that was a decision based on expediency. Finally, there is the warhead for which the UK is the design authority and that is UK-procured. Those are the core elements of our singular Trident system which provides the UK's nuclear capability.

Q146 Chairman: How is it operated?

Commodore Hare: The operational posture comes under the heading CASD which is Continuous-at-Sea Deterrence. The thought behind it is that at any one time we have one submarine deployed on patrol which houses the complete strategic and sub-strategic capability. The missiles on board that submarine for safety, confidence and security-building measures are not targeted at anybody, and the status is now reduced from that which existed in the cold war to a number of days. At any one time, however, there is one submarine ready to move up the alert and readiness status curve should the government of the day so dictate. The important point I would make about Continuous-at-Sea Deterrence and why it is such a pillar of our posture, if you like, is that this is largely a people issue. Operating nuclear submarines and the Trident system is an extremely complex and difficult business and we need to keep our people up to speed and focused on operating the submarines and missile system safely and effectively at all times. The best way to do that is by having one on patrol at all times. There is also the related escalatory issue that having one submarine at sea at all times is a recognisable status quo, so nobody will be confused by submarines coming and going from their base port at Faslane. If one did not have CASD but some alternative and just deployed submarines when one wanted to one might be sending incorrect signals which might be misinterpreted by any potential adversary. That would be a pretty dangerous thing.

Q147 Mr Holloway: Why would it take several days to operate them? Has some impediment been built in?

Commodore Hare: No. Trident is technically a very flexible system and it can really do what you want it to do within certain constraints, but its various sub-systems, for example the navigation sub-system, take time to reach their accuracy limits. As you will understand, if you are to have a system as accurate as Trident's you have to know exactly where you and your potential targets are.

Q148 Mr Holloway: But that would take several days?

Commodore Hare: Not necessarily several days. Retargeting the Trident system does not take very long. There are some political rather than technical issues to do with the seven

days' notice.

Q149 Mr Havard: The title of this discussion is the Strategic Nuclear Deterrent, but a doctrine is being developed about the sub-strategic use of what was designed as a strategic weapon or platform. Underneath that there may be a tactical use which is different. Can you say something about the idea of the use of this system in terms of its strategic and sub-strategic role?

Commodore Hare: I think that there is a lot of misinformation about the so-called sub-strategic role which you yourself mentioned. Sometimes it is confused with a tactical role which is not what either our policy or the Trident system is about. This is not a system that is geared or operated to achieve military objectives, by which I mean taking out a town, city, territory or whatever. It is for strategic use only and is on the right hand of the deterrence equation to be used *in extremis* when the survival of the nation state is at stake. When the sub-strategic concept was introduced its role was described by Lord Robertson in his speech in Aberdeen in 2001, if my memory serves me well. It will be on the record. We use the term "sub-strategic", not "tactical", deliberately. It is a sub-strategic role. What it means is that it offers the government of the day an extra option in the escalatory process before it goes for an all-out strategic strike which would deliver unacceptable damage to a potential adversary. It gives it a lower level of strike with which to demonstrate will, intent or whatever. It does not have to be used at all but it gives the government of the day that extra option at the sub-strategic level. To my mind, that is a welcome option.

Q150 Mr Havard: In terms of configuration that does not mean a great deal?

Commodore Hare: Not a great deal.

Q151 Mr Havard: You would deploy one warhead as opposed to a number?

Commodore Hare: The actual number and deployment and nature of warheads or missiles is fairly classified information, but as I said in my opening statement when each submarine goes to sea it has the capacity to fulfil the complete spectrum of capability, strategic and sub-strategic.

Q152 Linda Gilroy: Mr Whitehouse, from a technical and operational standpoint, to what extent is the UK's Trident system dependent on the Americans? Can you tell us whether in practice the UK could use the system independently of the United States if it so wished?

Mr Whitehouse: First, obviously the UK is reliant on the US facilities in Kings Bay for turn round of the missiles when the submarines are in refit, unlike Polaris. That is fairly fundamental. Secondly, the systems that sit within the submarine associated with missile targeting and firing are obviously reliant on design authority support from the US. That is another key element. In the event that any of the components within the re-entry vehicle system and warhead are reliant on the US for design safety case substantiation, that is a third key element. According to my understanding - perhaps Commodore Hare can add to this - obviously the decision to use the weapon is a very serious matter, but essentially that is something which is under UK control.

Commodore Hare: I would absolutely endorse that. Certainly, operationally the system is completely independent of the United States. Any decision to launch missiles is a sovereign decision taken by the UK and does not involve anybody else. I have read talk in the press about the Americans having some technical golden key. That is just not right; they do not. As Mr Whitehouse has indicated, the only engagement with the United States that we have now, and which we have had for a very long time, relates to the design authority for the missile and supporting launcher, fire control and navigational sub-systems that are housed in the Vanguard-class submarines.

Q153 Linda Gilroy: I think that some commentators also say that not only is it a technical golden key but in the event of the United States not liking a decision taken by the UK it could very quickly make it difficult for us to operate the system independently?

Commodore Hare: I would be very interested to hear how. The best analogy I can give is that if Ford went bust tomorrow all the Ford Focuses in the country would not suddenly come to a grinding halt. Certainly, it would be difficult if the United States withdrew its design authority and logistics support for the missiles, fire control launcher and navigational sub-systems. Eventually, it would cause some difficulty, but I argue that that would take quite a long time. I think that the risk of that happening is very low. As you know better than I, the Americans have been our allies for well over 100 years, and certainly there is no indication of the US withdrawing its support today or in previous history, as I understand it. One must balance that risk against the enormous cost benefits that we have in procuring an American system to house in our submarines. That should not be underestimated.

Q154 Mr Hancock: You are right to suggest that there has been a lot of press speculation about whether or not the system is truly independent. We have always prided ourselves

that this is our independent strategic nuclear deterrent, if we leave out of account the option that the Americans might shoot down a missile that we fired. One of the speculations in the newspapers and elsewhere at the weekend is that if the Americans wanted to prevent a missile being used they could bring it down. There was also the suggestion that technically they could disable a missile as they do with test launches. Missiles fired in tests are brought down by an inbuilt signal sent to the warhead or missile itself, not the carrier. Are both of you saying that the Americans do not have that capability? If we are to progress this debate the independence of our deterrent is of vital importance to the British people if they are to support something like this. If it is there only to back up the Americans that is a different thing. Do you say it is impossible for the Americans to bring down our missile by a code similar to that which they use in a test launch?

Commodore Hare: Nothing in this world is "impossible", but to the best of my knowledge and experience that is just not right.

Q155 Mr Hancock: "Not right" if it is possible for them to have that capability now you do not know of it?

Commodore Hare: Correct.

Q156 Mr Hancock: Mr Whitehouse?

Mr Whitehouse: I agree with that.

Q157 John Smith: Dealing specifically with communication systems to be able to target the missiles, is there any dependence on the Americans in that area?

Commodore Hare: Absolutely.

Q158 John Smith: I absolutely agree with your observation about our being allies for the past 100 years. That is why I sit back aghast when we have such difficulty in negotiating technology transfers on something as basic as the joint strike fighter. I am not exactly at ease with the idea that we should not worry about it because they have been allies for a very long time. But we are dependent on the Americans for being able to target our missiles?

Commodore Hare: No.

Q159 John Smith: Not in any way at all?

Commodore Hare: No.

Q160 John Smith: Not in terms of the transfer of data and

access to satellite communication?

Commodore Hare: We are independent. The dependency on the United States is that it is the design authority for the missile and its fire control, launcher and navigational sub-systems. We depend on them for design authority information and logistics support, but that is all. As to the other things you mention, we are truly independent.

Q161 Linda Gilroy: Mr Whitehouse, since the original agreement with the Americans in what ways has our deterrent developed differently, and does that give us any different added value in capability?

Mr Whitehouse: The 1958 agreement came about as a result of the American decision to cancel Skybolt. That resulted in the UK being given access to the Polaris capability. From the very first days of the submarine programme the US has encouraged divergence in terms of the technologies in the platform, obviously with the exception of the missile and its sub-systems. In most respects the submarine platform itself outwith the missile compartment and what it carries is a UK solution which has diverged significantly from US technology and the way that that has itself developed. What we have in the existing Vanguard-class submarines and the several Trident solutions is fundamentally a UK platform and approach to carrying the American missile system for delivering UK nuclear warheads.

Q162 Linda Gilroy: Does that give us the ability to do things which the United States deterrent cannot do, perhaps to go places where it cannot go?

Mr Whitehouse: Insofar as the submarines that we deploy are slightly smaller than the American ones, that is probably the only obvious external difference. In terms of capability - where a submarine goes and what it can do in terms of launching missiles - essentially it is the same as the American system. At the end of the day, the warheads built in the UK are deployed in American re-entry vehicles which come off the missiles when they deploy the warheads. Thereafter, in all essential terms the capability is the same as that of the Americans, probably even down to arming, fusing and firing.

Q163 Mr Jenkins: Commodore Hare, there are a number of British warheads depending on the requirements. Where are the warheads fitted? Can they be fitted or changed on board, or do the missiles have to be taken back to a British port to be refitted with different warheads?

Commodore Hare: All of this is very much a UK activity. The weapons are designed and constructed at AWE Aldermaston and

transported to the operational base in the north-west of Scotland and fitted there.

Q164 Mr Jenkins: We have spent a lot of time and money on this submarine-based system. What is the advantage and disadvantage, apart from the horrendous cost? Why do we not have one shore-based system? Why does it have to be a naval option?

Commodore Hare: The main reason is the vulnerability of the system. If one houses a deterrent system in a submarine it is virtually invulnerable. The submarine can sink beneath the waves and it is extremely difficult to detect once it is away from its home base. Any other land-based or air-based system is hugely vulnerable to a pre-emptive strike. One may recognise some cold war thinking about that, but that is the rationale behind the focus on a submarine-launched system as the primary system. It is interesting that France, which has a dual capability - air and sea - still focuses heavily on the submarine. I suspect that, should the Americans decide to move down from their current triad of land, air and sea capabilities, the very last one they would give up would be the submarine-launched system. The decision that faces you today is whether to extend the current capability rather than start from new. If the decision is made to have a continuing capability, I would argue strongly that there are a number of real advantages in terms of cost, expediency et cetera in pursuing the submarine option rather than the alternatives of land and air.

Q165 Mr Jenkins: I think that publicly there is a mistaken belief that we are thinking of replacing the existing system. I do not think that that is the debate. The debate is to find out now whether the existing system is the best option in future and what the alternatives are.

Commodore Hare: I would argue that at the moment the Government's position, as I understand it, is that it wishes to keep options open for continuing the capability perhaps after the life of the current Vanguard-class system runs out, and certainly there must be study and debate on what the most cost-effective system might be, be it a submarine, land or air option. I do not know the maturity of that debate and study work within government, but I am sure that that is what is going on. I agree with you. If it is helpful, I am happy to articulate why I believe that the submarine option is the most expedient for the country, but that may be a different point.

Q166 John Smith: I think it would be a good idea to develop the argument as to why it is the most expedient option and to build into the argument the affordability options within the sea-based system.

Commodore Hare: Perhaps I may start in a rather negative way, if you like, and articulate what I perceive as some of the disadvantages of having a land-based and air-based system. First, with a land-based system one would have to build a number of silos somewhere in the UK to house the ballistic missile that is required. That in itself brings with it huge difficulties in terms of costs and safety. Where would one site them? Can one just imagine the planning issues surrounding the siting of a silo anywhere in the UK? There are some practical issues there. Certainly, it would be extremely expensive. We have, laudably, very strong safety criteria relating to all nuclear installations in the UK. To meet those regulations would be very costly. Secondly, this country does not have a ballistic missile capability. We would have to buy a new missile which would be a new experience for us, and a pretty costly one. We would certainly have to design from square one a new warhead and go through all the very rigorous safety criteria for that missile and warhead. I believe that the cost of such a system would be extremely high. Of course, one is also left with the fact that it is vulnerable to pre-emptive strike. The air-based system that is being fielded in literature that I have read is the so-called cruise missile option. I have difficulty with cruise missiles. First, by its very nature a cruise missile is a military weapon, not a political one. Currently, with its conventional warhead it is used to achieve military objectives. I would be worried about housing our nuclear deterrent capability in something that could be confused with a weapon that is essentially a military device. Never mind the more practical fact that one would have to devise a new warhead to fit those missiles. One would need a lot of cruise missiles to deliver the strategic strike that one can achieve with Trident now. To fuse that with the aeroplane will be a very costly business, and again there is a whole raft of land-based infrastructure issues. Where does one store the weapons? Where would one store the aeroplanes? Again, that would be a costly issue and politically it would be pretty difficult. I return to the submarine platform option which to my mind has some benefits. The shore-based infrastructure is a given now; there is an accepted footprint of cleared nuclear installations, if you like, which is able to support the current Trident programme and will continue to support it at relatively modest cost for the foreseeable future. A lot of the infrastructure is already there. I cannot say that we know all the technical challenges that might face us in procuring something to replace the Vanguard-class, but certainly Mr Whitehouse and his team and others in British industry are expert at procuring nuclear submarines and pairing them with a missile system such as Trident. All that knowledge is there. The indications from the United States are that Trident works and fits the nuclear policy of both the Americans and this country. It seems to me that it is

the most expedient path to follow. As to the absolutely pivotal issue of cost, my gut reaction is that it would probably turn out to be the cheapest of the three options, although I have no studies or figures to support it.

Chairman: Mr Whitehouse, is there anything you would like to add to that?

Q167 John Smith: Would you deal also with affordability?

Mr Whitehouse: I agree with what Commodore Hare has said. There is no doubt in my mind, having looked at this simply as someone who is interested in it rather than in my professional role, that given the amount of infrastructure and capability in the UK at the moment to create and support a follow-on submarine, in the event that the UK has a deterrent of this type, the submarine option is the logical and, I believe, the most affordable one to go for. My understanding is that it has military advantages. I think there is a big issue sitting behind it, in that in the event we moved away form Trident D5 and the Mk4 re-entry vehicle and the warhead it contains we would be off on another major exercise to develop, without underground testing and proving, a new class of warhead. That is a very significant undertaking, bearing in mind that the existing warhead is based largely on American experience, albeit the detailed design and manufacture have been carried out in the UK. To go through what was gone through to create the Trident warhead in conjunction with the development of a new delivery mechanism and system would be a massive undertaking.

Chairman: We will now move on to the timetable.

Q168 Mr Borrow: If I may just give a general overview, the government has said on several occasions that it will need to make a decision on the future of the UK's strategic nuclear deterrent during this Parliament. Exactly what decisions need to be made, and what is the timetable for those decisions?

Commodore Hare: First, it is clear from free and open literature from the MoD that the clock stops, if you like, on Continuous-at-Sea Deterrence - the posture to which I referred earlier - around 2020. As to the timetable, I was impressed by the evidence the Committee heard from Michael Codner and Lee Willett from RUSI, so my answer will be broadly along similar lines to theirs. That is in published literature. Therefore, by 2020 something has to be done to ensure a continuing capability. My personal view is that the most likely option which will then occur is that there will be an extension programme for the four Vanguard-class submarines. Again, in the published literature I think that

some study has been made to look at the feasibility and costs of that. While the actual timelines and costs are not public knowledge - certainly I have no visibility of them - to extend those submarines is doable, probably not for very long, maybe for five or six years or something like that. That gives one a bit of a breathing space to procure a successor to the Vanguard-class submarines, be it land, sea or another submarine design, which takes us to having something operational by about 2024 or 2025. If you take my favoured submarine option, traditionally it has taken us rather a long time from concept stage to delivering an operational capability in nuclear submarines. Historically, it has taken up to 19 years. That is a very long time. I am sure that with today's knowledge and expertise we will be able to cut back on that. If we want something deployed by, let us say, 2025, we are talking about my favoured date for decision time of 2010. That is the first time that one has to take some big decisions, by which I mean that one has to start spending money. To my mind, 2010 is the time when one has to start making perhaps some fairly modest expenditure which ramps up later to extend the current Vanguard-class. One would also have to start spending some money on the design of the successor submarine system, if it was a submarine, with perhaps greater expenditure coming in the middle of the next decade, 2014 or 2015. In the smart procurement jargon, I am talking about the initial and main gates, but they are all to do with approval times for major expenditure. While I believe that some conceptual study work should be conducted now, and probably is but I do not know, I do not see any key decisions having to be made until 2010 if we want to continue capability after the Vanguard-class runs out.

Q169 Mr Borrow: Your view is that the existing Trident system is likely to become difficult in about 2020. It could be extended to about 2025. Therefore, 2025 is the date by which one needs to have a new platform and system in place?

Commodore Hare: Yes.

Q170 Mr Borrow: Your view is that the extension of the life of the existing system is four or five years?

Commodore Hare: That is my view. Mr Whitehouse is probably better qualified to answer this. I should have made it clear that there is no difficulty with the US-procured Trident system. The missiles, fire control, launcher and navigational sub-systems are fine, and there is a programme in place to extend them until time immemorial or 2040 - something that is way outside the timeframe that we are talking about. It is the submarine platforms which is the issue, in particular the nuclear steam raising plant which has a safety justification of 25 years. To renew that safety

justification is a non-trivial activity largely because of the very laudable, strong safety rating and criteria that have to be met. To extend those is non-trivial. It can be done but, to my understanding, not for much more than five or six years.

Mr Whitehouse: In terms of the life of the nuclear steam raising plant, that is an inherent function of the design features, metallurgy and duty cycle when the system is in use. Once the Vanguard-class has had its series of first refits the fuel life is not an issue because the fuel will be good for another 20 to 25 years. Within the MoD experience has been that the older classes of submarine have become less available and reliable because of reactor system issues in a third commission; in other words, beyond the 20-year point. One of the key issues is the extent to which the Vanguard-class reactor plant, which is a totally new generation plant, has inherently the same design features and issues that could cause problems and loss of availability towards the end of a second commission, if you will. There is an issue as to whether having had a second non-refuelling refit the Vanguard class can run beyond the five or six-year period. In that second refit the major systems within the non-nuclear components of the submarine itself would have to undergo major overhaul. We know what these systems and equipments look like as a result of the first overhauls after an eight or 10-year commission and, therefore, that could be tackled around the middle of the next decade in Vanguard and on the subsequent submarines. It is really the nuclear steam raising plant that one needs to focus on towards the middle of the second commission; in other words, after five or six years in service following second refit. There is in my mind, however, a totally different enter-left-stage issue that influences this decision. There is a big facility at Barrow with highly specialised skills and capabilities which builds these submarines. If the Astute-class runs to seven submarines - there is a massive affordability issue in relation to that - with an output of one every two years that build programme would be likely to end in about 2018. If there is not to be a significant strategic gap in their throughput and we are not to see them facing the possible loss of skills and capability they need to be getting on with the design and build of a successor submarine, perhaps the SSBN, to maintain capability. Once it disappears it would be very difficult to recreate. A lot of the difficulties with Astute have been associated with a gap in the design and build programme. It is not just an issue relating to the existing platform and the systems it carries; it is also a matter of the existing industrial infrastructure to build the submarines at Barrow and subsequently to support them at Devonport. As part of the submarine industrial base, we face our own issues with gaps appearing in our refit programme.

Given the present scale of the entire submarine programme, industrial infrastructure, fixed cost and capability retention issues are becoming very significant as an industrial dimension to this decision.

Q171 Mr Borrow: Are you saying that the Government is not in a position to say that it will not bother with a refit or life extension but will move straight to the building of a new platform, and the timetable is now so tight that there will be practical difficulties in delivering that by 2020?

Mr Whitehouse: If we look at the Vanguard-class build schedule, based on what appears to be publicly available information the period between the decision to go and having the submarine in service is 13 to 14 years. That timescale, however, benefited very significantly from a technology development programme which was in place for a number of years before that, associated in part with the new attack submarine planned at that stage. The Astute-class will have taken, in the event that it goes into service in 2009, 15 years to get there. It has, however, a number of cost issues associated with it. Therefore, if those are to be addressed and not replicated in a new class of missile-carrying submarine the Government/MoD will need to look at the adoption of perhaps more radical platform concepts rather than just putting the missile compartment into an Astute-class submarine. It will obviously need to do things in terms of the fundamental engineering of the submarine to address the problems of cost escalation associated with the supply chain and infrastructure that is needed to build these things. It is also probable that consideration will need to be given to the inclusion of some new technologies, perhaps moving towards fully electric propulsion to get away from all the mechanical equipment that sits in the machinery space. If one accepts that those things must be factored into the decision one would take a slightly different view from Commodore Hare and say that the concept work would need to step up a gear and get going sooner rather than later, and before 2010 if one is to have submarines becoming available perhaps in the early to mid-2020s. Finally, thinking a very long way ahead, that creates an interesting issue. The submarine class that enters service in 2025 with a life of 25 to 30 years will be carrying a missile system that the Americans have committed to supporting only until 2040 to 2042. That is a good illustration of the sorts of dimensions that have to be factored in in deciding when to start in order to have submarines available to maintain a Continuous-at-Sea Deterrence which requires three available boats to ensure that there is one at sea at any given time.

Q172 Mr Borrow: Looking at the political cycle, given that the Government has said that a decision needs to be made in this Parliament, which could run until 2009/2010, if the

main expenditure takes place post-2010, on which there seems to be agreement, but work needs to be done before that, irrespective of the decision of the Government whether or not to go for a replacement of Trident and maintain the independent nuclear deterrent, we must ensure that work is done between now and the next election so that whichever party is elected to form the government it is in a position to make a decision about the big expenditure to retain the capability. If that work is not done before 2009/2010, irrespective of which party forms the government after the next election, it will be too late to meet the timetable to replace Trident when it runs out?

Mr Whitehouse: If some pretty fundamental concept, assessment and optioneering work is not started imminently one closes off the option. If one does not close off the option, it makes it much more difficult to retain Continuous-at-Sea Deterrence some time early in the 2020s.

Q173 Mr Borrow: If the Government decided not to pursue the submarine option but to look at a land, ship or air option, how would it affect the timetable? Would that take even longer?

Commodore Hare: It is speculation. I am afraid that I do not know the answer to that question. I would guess that it would be a similar timeframe because of some of the technical challenges to be faced. While Mr Whitehouse and I may differ slightly on some of the key decision points and timeframes, we are absolutely agreed that there needs to be some modest expenditure now on conceptual study work to look at the options, timelines and potential costs to enable government to make a decision later on in the timeframe. That should be happening very soon, if not now.

Q174 Mr Hancock: The Americans have launched a new submarine with Trident capacity within the past two years, according to a paper I read. One boat has been built in the past two years and they are now looking at their next generation of boats. What is the difference between what they are going to do and what we would have to do?

Commodore Hare: I did not know that a new Trident submarine had been launched in the past year. What I do know is that they are in the process of converting a number of their Trident submarines to what are called SSGNs. They are redesigning the missile tubes so that instead of using them for Trident nuclear missiles they can accommodate Tomahawk cruise missiles. That has happened in the past two years. There is also the SSN generation of Virginia-class submarines which are non-nuclear ballistic missile submarines, but I do not know of any other.

Q175 Mr Hancock: Have they extended the life of any of their submarines?

Commodore Hare: Yes, they have.

Chairman: Mr Holloway, do you want to raise a particular issue about service length?

Q176 Mr Holloway: Are they not extending the life of the Trident submarines?

Commodore Hare: Until 2042.

Q177 Mr Holloway: What does that involve?

Commodore Hare: My understanding - Mr Whitehouse is better able to answer - is that their safety criteria are different from ours. They take the view that their SSBNs do not operate in such a hostile, aggressive environment as their SSNs and therefore they are able to take a slightly different attitude to the extension of reactor plants. We have a much stronger and different safety regime.

Q178 Mr Holloway: Mr Whitehouse, what would that involve for the Americans?

Mr Whitehouse: The original life of the submarines, based on what I have read publicly, was in part a function of the planned life of the D5 missile. A few years ago they took the decision that they would extend the planned life to 40 to 42 years by adopting a refuel and refit at the 20-year point. The maintenance regime that they follow is not too dissimilar from that in the UK, except that once they convert four of the existing 18 submarines to the SSGN to carry Tomahawk they will have 14 Trident-capable submarines each with 24 missile tubes, whereas we have 16. Seven will be deployed on each coast. The fundamentals, therefore, are that they have a rather less stressful deployment regime. They have far more submarines with more missile tubes deployed more widely geographically. That means that their work is less hard. There is no doubt that at the 20-year point they will be addressing some fundamental obsolescence issues in the equipments installed and basically doing everything that we do in our refits but at intervals that are twice as long as ours. It is really basic engineering. Obviously, they have taken the view that because of the operating cycles of their reactor plants they are able to perform up to that point in time.

Q179 Chairman: Mr Whitehouse, you mentioned the possibility of putting Trident missiles into Astute-class submarines. If that is possible when would an initial gate and main gate decision be needed?

Mr Whitehouse: My understanding is that the Polaris submarines, the Resolution class, were essentially a development of the attack submarine of the day with a missile compartment in the centre section. I am not involved in any of the classified optioneering and so I cannot talk about it. One of the options must be to look at carrying out a similar transition with the Astute-class submarine. It does, however, carry forward a lot of the technology from the preceding classes of submarine. It has obsolescence issues just sitting there waiting to jump out and it has affordability issues. One of the matters that the MoD will need to do is to look among other options at the creation of a new generation of SSBN, if it decides that that is what it wants.

Q180 Chairman: If that was what it wanted when would an initial gate investment decision be needed?

Mr Whitehouse: Given the affordability, engineering obsolescence and related dimensions, I would not markedly change my view that work would need to start on that immediately once it had been selected as the option. One does not know when one can downselect and say that is what one will do, but it would probably be within 18 months to two years in order to be sure that one has the first submarine available when needed and, looking at it from the industrial dimension, to try to create continuity in the build programme at Barrow.

Chairman: Let us now move on to the warheads.

Q181 Mr Havard: From what you have just been saying, it seems to me that there are almost two timelines running side by side. One is to do with platforms and one is to do with the actual warhead. Can you say what decisions need to be made and when about the actual warheads?

Commodore Hare: I have to say from the outset that I am not a warhead expert. Questions on warhead probably need to be addressed to AWE scientists. I will just give my view. A warhead is like any other piece of technology; it consists of a number of piece parts, some of which in time become obsolescent. Rather like one's car, one carries on replacing the piece parts until one day one either goes to a dealer or wakes up one morning and decides it is time for a new model. One moves from one's Ford Escort to a Ford Focus, to use that analogy. The UK warhead goes through a continuous process of safety and reliability assessment and pierce parts that become obsolescent are replaced, continuing the process in accordance with AWE Aldermaston's remit. I suspect that some time in the mid to late 2020s there will be time, if we still have a Trident system, for a replacement warhead to be procured, if you like a new model

of the same thing.

Q182 Mr Havard: In terms of decision-making you seem to be suggesting that if there is to be the replacement that you describe, as far as the platforms or boats are concerned the decisions at the conceptual stage need to be made next year?

Commodore Hare: I think that some study work needs to be started about the nature of the platform.

Q183 Mr Havard: When do decisions need to be made about the weaponry?

Commodore Hare: The warhead is related more to the Trident system. If we assume that we will still have a submarine-based system the warhead decision can be taken independently of the submarine. The warhead relates just to the missile. My personal view - it is just that because I do not know the answer to the question - is that one would not need to have a replacement warhead until well into the mid to late 2020s. One has, therefore, a little time on one's side before one has to make any decisions or have a peak in expenditure at Aldermaston.

Q184 Mr Havard: One set of decisions has already been made about Aldermaston. What do you see as the rationale for that?

Commodore Hare: In my limited dealings with Aldermaston I have always been hugely impressed by its dedication, skills and experience. I have always been hugely confident that it is able to fulfil its dual remit which is to maintain the stewardship of the current stockpile for safety and reliability and to be in a position to design and procure a new warhead should the government of the day decide that it wants one. When I was in post with Aldermaston there were two problems. First, its infrastructure was becoming very dated, by which I mean that a lot of its buildings were crumbling. Secondly, the workforce was following my age line, if you like; it was getting to the end of its professional careers. One needed to inject some young blood into AWE to perpetuate the skills base. My understanding is that the recent expenditure by government is focused on those two areas to ensure that the infrastructure is able to support the twin remit of Aldermaston and that the demography of the workforce remains sensible and there is an injection of new blood to replace retiring people.

Q185 Mr Havard: The Government says that the expenditure is to retain core skills, the safety of the current stockpile and its effectiveness and the replacement of facilities. As I understand it, the Trident missile system is a combination of things. The D5 is to be upgraded by the Americans to the

D5(A), or whatever it is. It has on it a W76 warhead, or something similar. There is also work being carried out on the re-entry vehicle. We are putting £350 million a year into Aldermaston between now and 2008 and 1,000 scientists are to be recruited. There is the Orion project which is a new laser that can simulate nuclear explosions, because we cannot test in the way that we did in the past. That is one-third owned by Lockheed Martin which is the company which produces the missiles. Are we really retaining a capability to develop our own nuclear deterrent? Is that what it is really all about?

Commodore Hare: I believe that we are. I can only speculate because it is a long time since I have been engaged with AWE. My information is the same as yours. I must correct one point. AWE Aldermaston is government-owned but contractor-operated. In the jargon it is called a GOCO (government-owned contractor-operated) facility. You said that it was owned by Lockheed Martin.

Q186 Mr Havard: As I understand it, there is a contractual agreement and one-third of it is owned by Lockheed Martin.

Commodore Hare: My understanding is that the operation of Aldermaston is through a consortium of Serco, British Nuclear Fuels and Lockheed Martin. You are quite right that Lockheed Martin is American-owned.

Chairman: Let us move on to the defence industrial strategy.

Q187 Linda Gilroy: Affordability is a key issue. Mr Whitehouse, can you tell us what are the prospects for the formation of Subco in addressing the issue of affordability and the extent to which it is likely to be able to do that if it comes about? What is your view on how we continue to obtain value for money beyond 2016 in relation to the shipbuilding and submarine requirements of the Government?

Mr Whitehouse: I think that the cost issues associated with the submarine capability in the UK are quite fundamental at this point, with a planned force level moving down towards eight SSMs and four SSBNs and the requirement to consider the procurement of further attack submarines as well as the need to cope with the decision on the future SSBN. There is a clear and absolute need to achieve consolidation and rationalisation because the nuclear facilities bring with them a lot of skills and very specialised and expensive infrastructure. The majority of those costs are fixed. Therefore, to take the whole enterprise forward and to keep it affordable it is of paramount importance to have cross-site consolidation and rationalisation. I focus on Faslane, Devonport and Barrow. As far back as 1994 when I was working on the initial tender document by Devonport to the

Government after the decision to privatise we went a long way towards bringing the then VSEL, the owners and operators of Barrow, into the DML consortium to try to start that. That was 12 years ago. The need even then was quite obvious. Where we sit today it is very important. The prospects for it are under debate at the moment. They have been influenced by some of the press coverage of possible developments last week, which I do not want to go into, but one way or another cross-site consolidation is fundamental. It must happen in order to save significant costs if a future SSBN is required and it is to be affordable.

Q188 Linda Gilroy: On the skills and knowledge base, if the decisions that we have talked about this morning were delayed what would be the implications? If there was a decision not to replace Trident and somebody wanted to take a future decision to do so what would happen to the skills base in the interim, and with what implications?

Mr Whitehouse: That is a very interesting point. A decision not to do things within the required timescale implies an intent at some time in the future not to have a deterrent. That is a fundamental message to send 15 years away from not having a deterrent through inaction. That is a very important political and philosophical point. First, in terms of the practicalities, in the event that work does not start within the required timescale - there are slightly differing views on that - an obvious point is that to keep the current deterrent going as long as possible perhaps more rather than less work would have to be done in the second refits. Secondly, near certain workload gaps would appear in the design and build capability associated with Barrow, unless it was possible to slow up the build rate for the Astute-class submarines and produce them over a longer period of time. But then it would be quite likely that the SSN force level would begin to drop because one would not have submarines coming into service quickly enough to replace the Trafalgars as they go out of service. It is almost like a matrix of influences and results, but there is no doubt that the key result would be a major affordability issue within the industrial base. Capability would be retained but would have nothing to do or one would have to let that go. It is a bit like weapons capability; once it is allowed to go it would be very difficult if not impossible to recreate it.

Chairman: We are going to finish the first part of the session here. On behalf of the Committee I would like to thank both of you for coming along and giving clear evidence and answering our questions so concisely.

Memorandum submitted by Dr Andrew Dorman, Dr Dominick Jenkins,

Mr Malcolm Savidge and Dr Bruno Tertrais

Examination of Witnesses

Witnesses: **Dr Andrew Dorman**, King's College London, **Dr Dominick Jenkins**, Greenpeace UK, **Mr Malcolm Savidge**, Oxford Research Group, and **Dr Bruno Tertrais**, Foundation for Strategic Research (Paris), gave evidence.

Q189 Chairman: I welcome all of the witnesses to our discussion. We have a lot of ground to cover in the next hour. You do not have to answer all of the questions just because you are all there. I ask the Committee to keep questions short and the witnesses to keep their answers short. Without cutting out the meat, try to keep them as tight as possible. Dr Dorman, I begin by asking you what you see as the nature of the threats that we face, first from the existing established nuclear powers, particularly Russia and China?

Dr Dorman: If I may go back slightly, we adopted a nuclear deterrent basically for two reasons: one was threat-based and the other was our status as a world power. In terms of the threat-based reason, there are existing nuclear powers including Russia, as you have articulated. Originally, the goal of Trident replacement was to deter what was then the Soviet Union, adopting the then Moscow criteria to destroy sufficient soviet sites to deter them from attacking the West. That threat has now receded quite significantly. In the short to medium term most analysts do not see a significant threat in that respect. The question is the longer term: can we see a resurgent Soviet Union in some form - Russia, China or some other big power in that area? In terms of minor threats, we talk about rogue states, to use American parlance. Would smaller powers potentially threaten to use nuclear weapons against the UK? Both those threat bases require potentially different types of nuclear response. If one is talking of a minor rogue state, using American parlance, one does not need assured second strike capability with the ability to hit a wide range of targets at any time of the day. They are likely to aim at only urban conurbations such as cities; they are unlikely to try to destroy our existing capability. The ability to destroy the British nuclear system as it exists now rests only with the likes of Russia. The question arises: do we need to retain that ability?

Q190 Chairman: I would like to move on to what you may have described as minor threats, perhaps emerging threats such as Iran or North Korea. Dr Jenkins, would you like to comment on the threats we face from Iran and North Korea?

Dr Jenkins: Dealing specifically with Iran and North Korea,

it is important to put this in context. American intelligence agencies say that any potential nuclear threat from Iran will emerge only in a timeframe of 10 years. The way Greenpeace views this, therefore, is that we have a window of opportunity to improve the situation by acting in a certain way, by which I mean not continuing to threaten Iran, for example.

Q191 Chairman: I am sure you are right about that, but we will get to issues such as what we should do. What I am trying to establish at the beginning is what the threats are. What do you in Greenpeace see as the threats?

Dr Jenkins: Our view is that the major threat is definitely the large existing nuclear powers which are in a state of forbearance and peace. This is very much the larger problem and, therefore, our action should be concerned primarily with preventing a return to a cold war-type situation.

Q192 Chairman: Mr Savidge, welcome back. What do you see as the threats from Russia, China, North Korea, India, Pakistan or wherever?

Mr Savidge: Basically, the assessment that the MoD has made in its most recent White Papers is that at present we do not face any major threat. Obviously, one can look at the question whether or not Russia at some point in future may become hostile. We make a reference in our written submission to a suggestion made by Liam Fox in a publication that we shall be bringing out this week, which I hope we can submit to you. It is a symposium of different views on this issue which I hope would be of great interest to the Select Committee. Liam Fox asks whether there could be a hostile power that conquered the whole of the rest of Europe without provoking a nuclear war and then was deterred by a British deterrent when it would not be deterred by a US nuclear deterrent. I suspect that that scenario was drawn up originally during the cold war and has not moved on very much since. If one looks at it, one must take account not only of the dissolution of the Warsaw Pact but the dissolution of the Soviet Union and the expansion of NATO and the European Union. One has a situation where there is a power balance. If one first takes the proposal that Russia becomes hostile one then has an incredible power imbalance between Russia as it is now and NATO as it is now. I just cannot see that as a likely scenario. Why would Britain on its own be likely to get into conflict with, say, China? It is also important to say that very often in the popular media there is a tendency to say that for some reason Iran or North Korea would be an immense threat to us if it got nuclear weapons. I cannot envisage the probability of this country, which does not now have an empire, getting involved out of region without being involved also either with the

United Nations or NATO or at least with the United States.

Chairman: Once again, you are moving on to the response that we might make. I am trying to work out the threat.

Q193 Mr Holloway: We are told that China has a small and very out-dated nuclear arsenal. In what sort of condition are the Chinese to accelerate and update their arsenal?

Dr Dorman: The Chinese nuclear deterrent forces are quite small compared with the other P5 members, to use that language. They could put more money into their capability and develop a more significant nuclear capability. That would take them some time. From the point of view of the UK, it is probably one of the countries least likely to be threatened by China given our geographical position *vis á vis* that country and given that other countries, particularly the United States, would be more of a threat presumably to China than ourselves.

Mr Savidge: My understanding is that China has some plans to expand its forces primarily as a response to its concern about missile defence, but again this is very much an issue of the United States in relation to China. I do not see that it has a particular effect on any potential threat to the United Kingdom.

Q194 Chairman: I am asking for trouble because I will expand the question slightly to the issue of the threat of international terrorism. Clearly, we face a threat from international terrorism. Dr Tertrais, is the issue of a nuclear deterrent at all relevant to the threat of international terrorism?

Dr Tertrais: I believe that it is only of partial relevance. Most of the defence and fight against international terrorism has nothing to do with western nuclear deterrence, British, French, American or otherwise. This would be relevant only in the very extreme scenario where a state deliberately sponsored a terrorist group and asked it to act on its behalf. If one of our governments had incontrovertible evidence that a terrorist act was being sponsored by another state's government and that it would be of such magnitude that it could enter the realm of our vital interests in such a case there would be a role for nuclear deterrence. That was what the French President tried to put forward in a speech on 19 January. That is an extreme scenario and my understanding is that it is understood as such by the French Government. Nevertheless, it is not excluded. If I may say a word about China, I disagree that because of its distance it is of no direct relevance to our nuclear deterrent. I believe that there are scenarios in which our nuclear deterrent, British or French, can be

helpful in countering a possible blackmail by China. For example, I believe that in a case where the Europeans are allied with the Americans in a crisis in the Far East if the Chinese wanted to deter us from supporting our allies and intervening in the region there would be a role for our nuclear deterrence, British or French. I do not accept the idea that there is no scenario in which China is a relevant consideration.

Mr Savidge: If I may respond on the issue of terrorism, Dr Tertrais has made a valiant attempt to make Jacques Chirac's recent speech sound sensible, but in the majority of cases where there has been any clear identification between a state and terrorist organisations it is usual that such organisations have a political objective. They are not likely to be the sort of organisations which would be interested in obtaining nuclear weapons. I would have thought that it would be the fanatical, absolutist organisations like Aum Shinrikyo or al-Qaeda which would have the objective of nuclear terrorism. It is, surely, very unlikely that they would be sufficiently closely identified with a particular state that it would be meaningful to try to use nuclear deterrence. Even with the identification that one had with, say, al-Qaeda and the state of Afghanistan, there was never a thought of nuking Kabul or something like that. I find that an improbable scenario. As to China, surely in any discussions of this sort we would be part of NATO. There has been a suggestion that China could blackmail us. One cannot rule out anything, but to me that is a low probability.

Chairman: We move on to nuclear proliferation.

Q195 Mr Borrow: If the UK Government has to make a decision essentially in the next couple of years either to replace or end its nuclear deterrent in 15 or 20 years, what effect will it have on the proliferation of nuclear weapons in the rest of the world? Perhaps we can start with Dr Jenkins.

Dr Jenkins: We take serious note of what has been said by the UN Secretary-General that there is a possibility of a cascade of nuclear proliferation. That point was also emphasised by a high-level panel at the UN. That has been underscored, somewhat less strongly, by Jack Straw in statements by him. There is a real problem but I think that it is a lesser problem than a return to the nuclear arms race. We believe that in a situation where all the major powers are not in a state of enmity we should see it as an opportunity to strengthen the NPT and so forth. This would be the worst possible time to go ahead with a new nuclear programme. It would send the wrong signal.

Q196 Mr Borrow: I gained the impression that Dr Tertrais

wanted to respond to that.

Dr Tertrais: I would be willing to. I do not think there is any evidence that unilateral disarmament by the UK, or France for that matter, would have any positive impact whatsoever on the dynamics of nuclear proliferation. I remind the Committee that during the so-called decade of nuclear disarmament, 1987 to 1996, tremendous efforts were made in arms control, disarmament and non-proliferation. During the same time the nuclear programmes of India, Pakistan and Israel, and Iran, Libya and Iraq for that matter, continued unabated until 1991. Although the argument has some appeal on paper, the dynamics of nuclear proliferation are not connected, or only very, very slightly, to what we do as established nuclear powers with our own nuclear programmes. Perhaps the conventional balance matters. For instance, there is a lot of evidence that the nuclear programmes of proliferating countries seek to counter our western conventional superiority. I argue that that probably matters more than what we do with our nuclear programme. I have never seen any convincing evidence to the effect that drastic measures of unilateral nuclear disarmament, especially by small nuclear powers like France and the UK, would have any meaningful impact on the dynamics of nuclear proliferation.

Q197 Mr Borrow: Mr Savidge, if the UK made the decision not to renew its strategic nuclear capability in 15 or 20 years what impact would it have on the ability of the UK to assume a leadership role in international arms control negotiations?

Mr Savidge: If I may say so, that puts the question extremely well. I agree with Dr Tertrais that there is a tendency on both sides of the argument to take too parochial a view and vastly overestimate the significance of the British nuclear deterrent within the whole scheme. I think that that applies to both sides of the argument. Dr Tertrais said that if Britain simply said that it would give it up it would not necessarily have an immediate effect. We ought to be looking at the whole question of whether this is an issue on which we should try to take a lead in a different sense. We have taken a lead in relation to things like climate change, global poverty and a whole range of other issues. By working together with other countries perhaps we can discuss this issue and see if we can push it forward, even against a very adverse international climate. We have had a degree of success with that. I think it very important to try between now and at least the next nuclear non-proliferation treaty revision conference to get the world community to look at the issue. We all know that if nuclear proliferation goes on and we continue to have wars at some point we are bound to have a disaster.

Q198 Chairman: It is in the nature of this debate that you are bound to disagree with one another from time to time. You will not need to express your disagreement in every case, particularly to come back on points. The discussion is extremely valuable, but disagreement will be a fact of life in this debate. We have had it before, and it is extremely helpful to us. Dr Dorman, I move to a point that you raised; namely, that possession of a strategic nuclear deterrent is partly threat-based and partly status-based. Do you believe that it gives us status and, therefore, we regard it as valuable to have nuclear weapons?

Dr Dorman: I think that when we originally decided to acquire nuclear weapons one of the reasons was status, and it was seen at the time - there is documentation on it - that cutting-edge technology was a symbol of our being then a world power, not a superpower, as we defined it; that is, a power with interests beyond our region. It is now old technology; it is not really a symbol of advanced technology. Most nuclear weaponry is relatively old technology. The question is whether it gives us any diplomatic leverage. One has a two-sided argument: first, whether if we got rid of these weapons it might give us a little more diplomatic leverage in some respects to nudge debates in other ways. The other side of the argument is that it still gives us a bit of diplomatic leverage. I think that the people best qualified to answer that would be the Foreign and Commonwealth Office in terms of how much they think it gives them the leverage that they need. One area of discussion is: can we imagine getting rid of nuclear weapons and leaving one other power in Europe with them? We have seen a number of statements in that respect.

Q199 Chairman: And the answer?

Dr Dorman: I think that we could. One of the matters that we have to think about in the field of defence is that this is all about balancing risk. If we make a decision to acquire a new generation of nuclear weapons it comes at a financial cost probably in terms of other defence capabilities. One of the big questions to be decided is: what level of capability do you want to give up to retain the nuclear capability, because it is unlikely that you will get more defence money?

Q200 Chairman: Dr Jenkins, as to status does it give us a seat at the top table?

Dr Jenkins: My short answer is that at this stage in terms of the Security Council we have that seat anyway and we would not lose it by not having nuclear weapons.

Q201 Chairman: Dr Tertrais, if the French were to give up their strategic nuclear deterrent would it be an enormous

blow to French pride?

Dr Tertrais: I am tempted to comment on some of the undertones of your question but I will not. Certainly, it would be a blow to the French conception of independence. I argue that if the French did develop their own independent nuclear deterrent force partly for reasons of status, influence and prestige, as I believe was also the case with the UK, in today's world that dimension is of much less importance than during the cold war. If the French took the step that you mention I believe that it would definitely mean a clean break with the traditional French concept of independence. The French nuclear programme was, and still is, intimately linked with its concept of independence and, I add, its independence *vis á vis* the United States, because that is what it is all about. Michael Codner, whom I believe you heard, said that there were two concepts of independence: the British one and the French one. These are two concepts of nuclear independence. The British and French do not have the same concept of nuclear independence, although in both cases the intimate link between nuclear status and the relationship with the United States is very important.

Q202 Chairman: We will come back to the French stance towards the end. Mr Savidge, would you like to add anything to the issue of top table status?

Mr Savidge: Our membership of the Permanent Five is based on our position in World War II. It is really coincidental that those became the nuclear powers. If we look at it now, when talking about expanding the Permanent Five there is no particular suggestion that because India has nuclear weapons it would be favoured before, say, Japan or Germany. Looking at our status within G8 and the EU, there is no particular indication that the nuclear powers are favoured as against the non-nuclear powers. In general, most of the major disarmament talks were either bilaterals between the United States and the then Soviet Union, now Russia, and the multilateral ones have tended to involve nuclear and non-nuclear powers. I do not think that there is now a great status argument.

Chairman: Let us move to the issue of the independence of the UK's strategic deterrent.

Q203 Mr Holloway: Dr Jenkins, in your written submission to the Committee you cast doubts on the independence of our weapons. In what ways do you consider them not to be independent of the US?

Dr Jenkins: Often the debate continues to be framed in terms of deterrence, whereas the Soviet Union is no longer there

and in a sense the purpose of nuclear weapons is being reinvented both here and in the United States and perhaps elsewhere. I think that it is in that context that we should consider the question of independence. First, Trident is very much a trans-national enterprise. I have given some of the technical details of that. The way I put it is that, first, we now have the doctrine most strongly articulated in Washington of the pre-emption of conventional war fighting with usable nuclear weapons. There is an interrelationship. In technical terms, because Trident has been made trans-national we may be inheriting parts of that doctrine so that, talking specifically about rapid retargeting, it appears that we have already acquired that new capability. What would be the purpose of having that rapid retargeting capability? Clearly, we already have the capacity to hit Moscow.

Q204 Mr Holloway: The question was about our operational independence. What do you consider to be the factors in relation to that question?

Dr Jenkins: In a previous session the question was raised whether in the final analysis if we were attacked with a nuclear strike we would be capable of responding to, say, a Russian attack.

Q205 Mr Holloway: Independently of the Americans?

Dr Jenkins: I think that is correct. However, the real life scenario today is not that because we will not be attacked by Russia. In that situation the only real circumstance in which I can conceive we would ever use it would be to assist an American attack, because for any other purpose Washington has so many means to come back at us, ranging from the kind of economic coercion that it exercised after Suez to much simpler things such as degrading the technical capability of the system.

Q206 Mr Holloway: Dr Tertrais, if we tried to have a system which was not reliant on American technology, Kings Bay et cetera, what would be the factors involved in that, and what would be the cost of developing our own system?

Dr Tertrais: I believe that it would be more costly for the United Kingdom to pursue other options, such as building its own system or even buying a French system. That would certainly be more costly than an American option. Are you asking me to give you some specific cost figures?

Q207 Mr Holloway: No. I just want your general impression.

Dr Tertrais: My general impression is that given what I know about the very close defence relationship between the UK and

the US any US option will always be cheaper in strict cost terms than any other option.

Q208 Mr Holloway: We took evidence from someone a couple of weeks ago. He suggested that talks were taking place at the moment between the British and French on the subject of their nuclear weapons and some sort of mid to long-term co-operation between them. Have you any idea of those talks and the nature of the matters being discussed?

Dr Tertrais: I certainly have a good idea of the general nature of French/British nuclear co-operation. In a previous capacity I participated in it. My understanding is that today, as a few years ago, there are two kinds of co-operation: political/strategic co-operation, with a close strategic dialogue on nuclear issues, including nuclear deterrence, and also staff talks, that is, a dialogue between your nuclear military staff and ours. That has been going on for years. I am not aware of their current agenda. I would be very surprised if at this point in time there were in-depth discussions about the long-term future of practical, technical co-operation between France and the UK. I would be very surprised if in parallel with government thinking here some options were being seriously discussed at this point in time.

Chairman: Once again, we will come back to that issue towards the end. I would like to move on to the timetable for decisions to be made.

Q209 Mr Jenkins: If you do not have an answer to my question please say so. I want to try to get some evidence and facts on the table. There may be different opinions, but within the public arena I want to give everyone a chance of putting their view on the table rather than debate it during the present session. Dr Dorman, it is said that we need to take a decision in this Parliament with regard to the future of our system. What exactly are the decisions that need to be taken, and why do they need to be taken now?

Dr Dorman: I think that some decisions need to be taken in this Parliament, for example whether we want to replace the nuclear deterrent and what type of capability we want. We need to make some significant decisions about where we go in the long term. As alluded to in the session earlier this morning, there is an industrial dimension. If you want to go for the submarine-based replacement programme there is a potential gap or window in terms of the production of submarines between the Astute-class and the replacement of the Trident fleet, if the Government says that the Trident fleet needs to be replaced. We have seen problems with the Astute-class. We had a downturn in submarine orders and there was a loss of skill sets which they had to rebuild. If

you want to delay your Trident replacement or try to replace it with the same system you will have to continue to build additional SSNs or nuclear-powered attack submarines to keep the production line going, or you will have to acquire the ballistic missile submarines earlier. If you decide to go for a different system, whether it be land or air-based, you will start to run down the potential nuclear build capability.

Q210 Mr Jenkins: You are doing the one thing that I did not want you to do. I asked a specific question. I can ask a lot of questions and give you the opportunity to pick which answers to give, but I do not want to do that. That was why I asked what decisions needed to be taken, and when.

Dr Dorman: I think that we need to decide by the end of this Parliament whether we want to replace the nuclear deterrent and what type of capability we want. That will then allow one to start making decisions early in the next Parliament in terms of acquiring those capabilities.

Q211 Mr Jenkins: I have asked you twice now and I will leave it at that. Mr Savidge, do you have any idea what decisions have to be made in this Parliament and when?

Mr Savidge: One hears very diverse advice on this matter. Today, we heard Mr Whitehouse make a clear case for why the industry would find it optimum to have the longest possible time and the earliest possible decision to keep the industrial base and skills going. Obviously, that is one aspect of the case. Having listened to various experts at conferences and read some of the literature, it seems that a lot of others suggest that the boats might be kept going longer and that in an emergency rather than the optimum for the industry one might be able to have a shorter lead time to produce a replacement, particularly if it was to be a submarine.

Q212 Mr Jenkins: I was hoping for a date, for example that by 2009 or 2010 we have to make a decision, because if we do not there be consequences. The consequences, quite simply, will be that once we lose our skill base the decision is made for us. Maybe I am asking the wrong people; maybe you do not have the knowledge and experience to give me those dates?

Mr Savidge: Certainly, I would be happy to talk to my co-authors who obviously would have more expertise on matters such as nuclear reactors. I could provide the Committee with a written submission later. I have to say that the general view is that we do not have to make that decision before the end of this decade. That was the view expressed by Commodore Hare and a number of others. When Mr Whitehouse went for an

earlier date he was talking about when the decision about concept had to be made. That could still mean that one would not have to make the actual decision whether or not to go ahead until after 2010.

Mr Jenkins: We have already made a decision about Aldermaston. Because of the aging workforce we need to put more people into the establishment to maintain the capability. All these things play an important role. Chairman, I do not think that the witnesses have the necessary back up and experience to deal with the timetable.

Chairman: That is probably so.

Mr Jenkins: It will be a waste of our time to continue. To shorten the timetable perhaps I can forgo that section.

Chairman: Let us turn to what other possibilities there might be in regard to the service life extension of Trident.

Q213 Linda Gilroy: Dr Dorman, the United States is in the process of extending the service life of its Trident submarines in order to keep them in service until 2042. What is the US doing to extend the life of its force, and should the UK embark on a similar programme of service life extension for the Vanguard-class?

Dr Dorman: I declare that I am not a scientist and cannot give you the exact figures. I understand that, for example, we have a different reactor system on our boats from the American boats, which means, as alluded to in earlier submissions, that if we want to extend the life of the boats we can make that decision but we start to run into some risks about how long those platforms will run. To go back to the Polaris system, you may remember that in the early 1990s we extended the life of those boats and started to run into difficulty in keeping them at sea while the Trident system came on board. The danger of service life extension is that that might happen again. You start to get into the "what ifs". What happens if something goes wrong with the system?

Q214 Linda Gilroy: In your paper you say that the decision faced by the UK is what effect it wants to achieve and at what price. You refer to Trident as the deluxe system and say that it may not be necessary given the threats that the UK faces after the cold war. What are the alternative procurement possibilities?

Dr Dorman: You have the full range. You can have no nuclear capability whatever. You can have what the Japanese have which is a virtual nuclear deterrent. They have nuclear expertise and a nuclear industry. They could design a warhead relatively quickly. They have their own space

programme and so could design a ballistic missile relatively quickly. Within the space of a couple of years they could constitute a nuclear capability if they so wished.

Q215 Linda Gilroy: I will come back to that in a moment. I think that in your paper you also mention cruise missiles with nuclear warheads?

Dr Dorman: I was going to move to that. Trident is deluxe in that it gives you, under the then Moscow criteria, the ability to level a number of cities at any moment of the day and assured second strike. This was a system that could not be destroyed on the ground or, in this case, at sea; it was impervious. If one wants to start taking further risks to minimise costs one can go for an air-based system, whether it be free-fall bombs, which you will remember we had up until 1998, or cruise missiles. The simplest way would be to take the existing Storm Shadow which has come into service as a cruise missile and put a nuclear warhead on it. One could have a land-based system. If one did it very crudely, one could take the existing Trident missiles and put them on land. That would probably be the least popular solution. Generally, we have moved away from that and gone towards either air or sea-based systems. But they will give options that will keep one in the nuclear game at lower cost.

Q216 Linda Gilroy: To return to the idea of the virtual nuclear state, you have explained a little what you mean as far as Japan is concerned. Is that really likely to be taken seriously as a deterrent?

Dr Dorman: One suggestions that some of the panel have made is that if we cannot see nuclear weapons being used against terrorist organisations and potential proliferating states, our main concern is a resurgent Russia or China-type scenario. One has a lead time in which one thinks that that threat will emerge and become significant, in which case the virtual nuclear arsenal solution gives one the ability to redevelop and rebuild the nuclear capability, if one so wishes, over that timeframe.

Q217 Linda Gilroy: Provided that the states that you are talking about do not have their own?

Dr Dorman: It assumes that if Russia suddenly becomes a big nuclear threat to the United Kingdom it will be over a number of years; it will take them some years to reconstitute its nuclear capability, but again it is about what risks one wants to take.

Q218 Chairman: Dr Dorman, you heard Commodore Hare and Mr Whitehouse earlier talking about the alternatives to nuclear-based missiles. I got the impression they believed

that a cruise missile-based system would not necessarily be any cheaper than a submarine-based system. Did you disagree with that while they gave that evidence? If you did, on what would you base your disagreement?

Dr Dorman: It can be cheaper depending on how one runs it. If one wants to run a cruise missile system based either in the air or on submarines that is always available to be used it becomes very expensive. That is an ongoing commitment. If one bases it on the same systems being used for alternative operations where one can then use the nuclear programme it becomes far cheaper because one is not keeping people constantly on alert. If you remember, we had the W177 with free-fall bombs and Tornadoes. Those Tornadoes in the post-cold war period would generally make conventional training sorties but could then be used in a nuclear role. All one needed to do was keep Aldermaston going and keep those bombs in service and maintained and keep the armaments people on station. It is not that big an infrastructure. If one wants to keep a permanent air alert it becomes far more significant.

Chairman: Dr Tertrais, we said that we would return to the relationship with France.

Q219 Robert Key: Dr Tertrais, I start with some technical questions about the French deterrent. Can you tell us the nature of that deterrent, technically? One has missiles and submarines. Can you please expand?

Dr Tertrais: The French have two components, one of which is nearly identical to the British one: a force of four submarines with long range ballistic missiles with one on patrol at all times. I would, however, argue that the current missile in terms of technical preferences is inferior to the Trident 25. There is an additional air-based component which includes everything because it is some form of cruise missile. That is the weapons system for that component. The vast majority of French nuclear warheads are in the submarine force. Nevertheless, the French consider that they are really two different legs and each is necessary to ensure a credible deterrent.

Q220 Robert Key: Can you explain a little the post-nuclear testing generation warhead, the TNA?

Dr Tertrais: When France decided to commit itself to this in the early to mid-1990s there was a decision to develop a new formula for new generation warheads. The warheads could not be tested any more. The formula for that new generation was deliberately tested. Several nuclear tests in 1995 in the final French campaign were specifically devoted to validating this new formula. As has been said, this formula

will be used on weapons which will begin service two years from now. The formula was tested in 1995/1996 but the warheads are coming into service by 2008. We call them robust warheads which means that they are bigger, heavier and less modern, but they have the great advantage of not needing to be tested any more. To give you an idea, the way that the Americans speak about reliable replacement warheads these days sounds a lot like the sort of things that we have done.

Q221 Robert Key: The President has recently said something about the targeting policy of France. Can you expand on that?

Dr Tertrais: One can say that in public discourse at least there are two different forms of targeting, one of which is targeting *vis á vis* major powers. They define major powers as those that can threaten the very survival of France as an organised state or entity, such as Russia, China or perhaps others in future. As to these, France exerts deterrence through the threat of unacceptable damage of any kind. The French consider that there is another class of potential adversaries whom they call regional powers. For this class the deterrence would be exerted through the targeting of centres of power, that is, political, economic or military - the things that the leaders of such countries would hold dear. Therefore, it is assumed generally in public literature that the planning of options would be more limited and targeted for regional powers than for major powers.

Q222 Robert Key: The policy of the French Government is that the second type of targeting policy would cope with the issue of international terrorism?

Dr Tertrais: No, it would not, certainly not in such general terms. It would have a relationship with the issue of international terrorism only in the extremely hypothetical case where the head of state or government of such regional power decided to try to bypass our nuclear deterrence by trying to hide himself or itself behind a terrorist group that would make a major attack, or threaten to make a major attack, on French interests.

Q223 Robert Key: It seems to me that in France there is very little debate or disagreement about the nuclear deterrent, certainly much less than in this country. Can you explain that to me?

Dr Tertrais: I think that is true. The consensus, maybe not so much in terms of public opinion as in political parties, is much stronger in France than in the UK. I have a feeling - I have never made any detailed study of it - that there

are two factors involved. One is the fact that nuclear weapons today are still associated with de Gaulle - of course not de Gaulle himself - and independence.

Q224 Robert Key: *Le force de frappe*?

Dr Tertrais: Yes, although that expression lasted for only two or three years, I believe. In 1967 we took the strategic decision to be fully independent for survival and that required an independent nuclear deterrent. That has remained very firmly in the French strategic culture. The second reason which is linked to the first is that basically the sensitivity of the debate in this country, as I understand it, and your relationship with the United States is by its nature very different from what we have; in other words, all nuclear debate is linked to the debate about your relationship with the United States. Ours is in a very different position. Perhaps I may add that traditionally while there has been a fairly strong consensus on the virtues of nuclear power, military and civilian, we do not have a strong green or environmentalist movement in our country. This is a statement of fact.

Q225 Robert Key: I can certainly confirm that from my observations. Suppose that the United Kingdom decided not to replace Trident and phased out nuclear weapons. Would France then regard itself as the nuclear power for the whole of Europe? Would you see France taking over the role of providing a European nuclear shield?

Dr Tertrais: That is a very big question. I think that there would be two different reactions to that hypothetical decision. One would be, "Oh, we are now the only nuclear power left in Europe, which means that potentially we have a more important role in the future protection of Europe". But I must add immediately that I think there would also be a second reaction, that it would increase pressure on the French to do the same thing. The argument sometimes used is that each wants to be the only nuclear power in Europe. I do not think that that is a real world argument. In the real world responsible French leaders would think, "Well, if the UK is beginning this trend there will be more pressure on us to follow suit and that is a problem for us." I believe that the French are happy with a situation where there is more than one nuclear power in Europe.

Q226 Robert Key: I have spent the past quarter of a century regretting the fact that France has not been a member of the Nuclear Planning Group, for example. Do you think there is any prospect that France would begin to co-operate more closely with Britain in a nuclear programme?

Dr Tertrais: Like you, I regret that France does not

participate as an observer at the NPG. I think that it could and should do so at zero political cost. That being said, is France ready to co-operate more with the UK? My assumption is that it is, but my understanding of the way French political leaders take stock of 10 years or so of nuclear dialogue is that they have the impression that there is a kind of glass ceiling beyond which it is very difficult to go in terms of French/British nuclear co-operation. That glass ceiling arises partly from the existence of strong technical co-operation with the United States in the nuclear military field but also perhaps from how far the British are willing or able to go in greater Europeanisation of the nuclear deterrence programme. My understanding is that French leaders are willing and able but are not so sure that the Brits are.

Q227 Robert Key: I have also spent 25 years trying to understand the nature of the French state and how French citizens perceive their state. That is inconceivable to a Brit. We cannot begin to imagine how the French can be as attached to something called the state of France, and you on the other hand cannot imagine how we can be so friendly with the Americans. But I find this hard to believe when we have so many defence procurement programmes in common France, with the involvement of big companies like Thales. We know that the French and British Governments are talking to each other about aircraft carriers. The French must be rubbing their hands as they see the joint strike fighter arguments rage. You envisage buying a British-designed carrier from which Rafale aircraft will deliver French nuclear missiles. Is this my wild imagination?

Dr Tertrais: Not at all. I think that for the French in terms of future European or British co-operation many things are open as long as it does not encroach on their very specific concept of independence *vis á vis* the United States. Beyond that, those things are possible. I certainly concur with your characterisation of the French attachment to the state. I think that the French attachment to nuclear weapons is also part of the same cultural background. I add that such hearings as this could not take place in France.

Q228 Robert Key: Why not?

Dr Tertrais: First, because our Parliament and foreign defence policy are much less important in our system than in yours. Secondly, the executive branch is extremely touchy about any debate in Parliament on nuclear deterrence, and there is a lot of frustration among your French counterparts on that. Nuclear deterrence is really an issue for the President. It is a kind of joke to say that in terms of pure nuclear strategy and policy the real monarchy is in France, not the UK.

Q229 Chairman: Dr Tertrais, you have won our hearts. Dr Jenkins, does Greenpeace have a view as to whether France has a strong green movement?

Dr Jenkins: We have an active campaign in France directed against the M51 programme. We think that the way forward is a European approach, and certainly part of that would be a freeze on that new development as well as our own potential new Trident system. That would be helpful as part of the development of an alternative European approach to that put forward by the United States.

Q230 Mr Jenkins: Dr Jenkins, you said earlier that Russia was no longer a threat. What inside information do you have? According to my information, at the present time the Russian state is fragile and, looking forward, it will become more fragile. What guarantee do you have that we will not see a backward lurch from democracy to a totalitarian state in Russia which has the second largest arsenal of nuclear weapons? Why do you feel that you have the right to put our country's future defence on hold because you have the inside track on Russia in future? Would you like to inform me about how you have obtained that information?

Dr Jenkins: Perhaps I may clarify what I said. I think I was quite direct in saying that the major threats that we might face in future and should be most concerned about were from the existing major nuclear powers. Contrary to what you said, I took the realist's view that Russia could again be a threat. I very much agree with Mr Savidge's specific reasons why at the moment it is not a threat. It is for that reason that I think it most important to use this time when we have good relations with Russia to take forward multilateral disarmament, playing very much a leadership role in conjunction with other major states. I think there was a bit of a misunderstanding in that respect.

Mr Jenkins: I am glad you have clarified that.

Q231 Chairman: Dr Dorman, you gave the impression that you wanted to add something.

Dr Dorman: I should like to add something to the debate. If I may go back in history, in the early to mid-1990s when we were considering replacement of the sub-strategic deterrent at one point we looked quite closely with the French at a new cruise missile. We subsequently decided to go for the sub-strategic Trident option instead but we looked at an air-launched cruise missile with the French. We have had quite significant links with them.

Q232 Linda Gilroy: Dr Tertrais, the French programme takes up a much bigger slice of the defence budget and is much

more expensive. Although I hear what you say about it being the President's decision, what sorts of pressures emerge from that, and is it a growing problem?

Dr Tertrais: It is certainly a growing problem. There are lots of pressures from those inside the defence establishment, including of course the military circle, who are not concerned with nuclear deterrence issues and are persuaded, I think wrongly, that if they took money out of the nuclear budget it would automatically go to the conventional defence budget. I am not sure that that exactly captures the way that our defence budget has been constructed. That idea, nevertheless, exists. More generally, among the up and coming generation of politicians and military and civilian leaders nuclear deterrence is something less obvious, and certainly less than a given, than it was to the previous generation. I am fond of saying that the next president in 2007, whoever he or she might be, will be the first politician of the post-World War II generation. He or she will see the world through very different eyes from those of the previous one. There will be strong pressures on the next president, whoever he or she might be, to reduce the nuclear budget, and I believe that it will be a very interesting moment for the future of nuclear deterrence.

Chairman: You will not have been able or had time to say all that you could have said, but that is because you are experts. I am grateful to all of you for coming to give very important evidence to this inquiry.