



House of Commons  
Public Accounts Committee

---

# The United Kingdom's Future Nuclear Deterrent Capability

---

**Eleventh Report of Session 2008–09**

*Report, together with formal minutes, oral and  
written evidence*

*Ordered by the House of Commons  
to be printed 9 February 2009*

**HC 250**  
**[Incorporating HC 1154–i, Session 2007–08]**  
Published on 19 March 2009  
by authority of the House of Commons  
London: The Stationery Office Limited  
£0.00

## The Public Accounts Committee

The Committee of Public Accounts is appointed by the House of Commons to examine “the accounts showing the appropriation of the sums granted by Parliament to meet the public expenditure, and of such other accounts laid before Parliament as the committee may think fit” (Standing Order No 148).

### Current membership

Mr Edward Leigh MP (*Conservative, Gainsborough*) (Chairman)  
Mr Richard Bacon MP (*Conservative, South Norfolk*)  
Angela Browning MP (*Conservative, Tiverton and Honiton*)  
Mr Paul Burstow MP (*Liberal Democrat, Sutton and Cheam*)  
Mr Douglas Carswell MP (*Conservative, Harwich*)  
Rt Hon David Curry MP (*Conservative, Skipton and Ripon*)  
Mr Ian Davidson MP (*Labour, Glasgow South West*)  
Angela Eagle MP (*Labour, Wallasey*)  
Nigel Griffiths MP (*Labour, Edinburgh South*)  
Rt Hon Keith Hill MP (*Labour, Streatham*)  
Mr Austin Mitchell MP (*Labour, Great Grimsby*)  
Dr John Pugh MP (*Liberal Democrat, Southport*)  
Geraldine Smith MP (*Labour, Morecombe and Lunesdale*)  
Rt Hon Don Touhig MP (*Labour, Islwyn*)  
Rt Hon Alan Williams MP (*Labour, Swansea West*)  
Phil Wilson MP (*Labour, Sedgefield*)

The following member was also a member of the committee during the parliament.

Mr Philip Dunne MP (*Conservative, Ludlow*)

### Powers

Powers of the Committee of Public Accounts are set out in House of Commons Standing Orders, principally in SO No 148. These are available on the Internet via [www.parliament.uk](http://www.parliament.uk).

### Publication

The Reports and evidence of the Committee are published by The Stationery Office by Order of the House. All publications of the Committee (including press notices) are on the Internet at <http://www.parliament.uk/pac>. A list of Reports of the Committee in the present Session is at the back of this volume.

### Committee staff

The current staff of the Committee is Mark Etherton (Clerk), Lorna Horton (Senior Committee Assistant), Pam Morris (Committee Assistant), Jane Lauder (Committee Assistant) and Alex Paterson (Media Officer).

### Contacts

All correspondence should be addressed to the Clerk, Committee of Public Accounts, House of Commons, 7 Millbank, London SW1P 3JA. The telephone number for general enquiries is 020 7219 5708; the Committee’s email address is [pubaccom@parliament.uk](mailto:pubaccom@parliament.uk).

# Contents

---

<b>Report</b>	<i>Page</i>
<b>Summary</b>	<b>3</b>
<b>Conclusions and recommendations</b>	<b>5</b>
<b>1 Making important decisions</b>	<b>7</b>
<b>2 Managing dependence on the United States</b>	<b>10</b>
<b>3 Managing the programme effectively</b>	<b>12</b>
<b>Formal Minutes</b>	<b>15</b>
<b>Witnesses</b>	<b>16</b>
<b>List of written evidence</b>	<b>16</b>
<b>List of Reports from the Committee of Public Accounts 2008–09</b>	<b>17</b>



## Summary

---

The United Kingdom first deployed a submarine-launched nuclear deterrent in 1968. Since then, successive governments have been committed to a policy of continuous at sea deterrence, meaning that at least one nuclear-armed submarine is on patrol at any one time. In its 2006 White Paper,<sup>1</sup> the Government announced its intention to maintain the United Kingdom's nuclear deterrent capability and set out its plans to build a new class of submarines to replace the current Vanguard fleet and to participate in the United States' Trident D5 ballistic missile life extension programme.

The Ministry of Defence's (the Department's) ability to sustain its nuclear deterrent capability in the future is dependent on collaboration with the United States. The new class of submarine is likely to remain in service beyond the extended life of the existing Trident D5 missile, which will be renewed in 2042, and must therefore be compatible with any successor missile developed by the United States. The Department has received a series of assurances from the United States that any new missile will be compatible with the United Kingdom's new submarine class. Nevertheless, the concern remains that the Department has no direct control over the development of the new missile.

The future deterrent programme is still at the concept phase. The Department has yet to make many decisions about the principal parameters of the submarine design, the type of nuclear reactor, and the design and size of the missile compartment. The Department expects to make these decisions by September 2009. To respond to an already challenging timeline, the Department plans to overlap the submarine's design and construction phases.

The Strategic Deterrent Programme Board is chaired by the Senior Responsible Owner, who is responsible for coordinating the delivery of the future deterrent. In order to succeed, the Senior Responsible Owner must maintain strong relationships across other departments to ensure that he delivers the capability that the government as a whole requires. He must draw on performance management information that is still evolving and operate in the context of a challenging commercial environment, characterised by monopoly suppliers.

On the basis of a Report from the Comptroller and Auditor General,<sup>2</sup> the Committee took evidence from the Accounting Officer and supporting witnesses on: making important decisions, managing dependence on the United States and managing the programme effectively.

---

1 *The Future of the United Kingdom's Nuclear Deterrent*, Cm 6994, December 2006

2 C&AG's Report, *Ministry of Defence: The United Kingdom's Future Nuclear Deterrent Capability*, HC (Session 2007–08) 1115



## Conclusions and recommendations

---

- 1. The Department's existing cost estimates do not provide an accurate baseline against which to measure progress.** The forthcoming revised cost estimates should distinguish between future deterrent costs and the general overheads of the submarine industrial base, and provide clarity as to how the Department intends to deal with VAT, inflation and contingency.
- 2. In September 2009, the Department has to make key decisions about the submarine design which will have implications for the procurement and support costs of the programme for decades to come.** Given the importance of these decisions, the Department should commission independent validation of the assumptions underpinning its cost models and assess the reasonableness of its estimates using historic trend analysis.
- 3. Suppliers to the submarine industry constitute a highly specialised industry sector, with a number of monopoly suppliers. Given this imperfect market environment, value for money will be hard to achieve.** The Department should specify exactly how it will ensure it obtains value for money from its suppliers and set out performance indicators for the programme, against which it will report to Parliament.
- 4. The United Kingdom's new submarine will incorporate an American-supplied missile compartment. As the current Vanguard fleet will go out of service in the 2020s, the United Kingdom's programme is running ahead of the United States' programme. The United Kingdom will therefore have to make key design decisions on a replacement submarine before the United States.** Given the unavoidable dependence on the American programme, the Department should analyse the lessons from other projects where the Department has been dependent on the United States for critical elements of technology. The Department should use this analysis to inform the development of its proposed communications plan.
- 5. Given the lack of time contingency for the submarine construction programme, some overlap between the design and production phases of the programme is likely to be necessary.** The Senior Responsible Owner needs to set out how he will trade between the risks and opportunities involved in managing overlaps, and agree an explicit change management mechanism with other departmental teams and commercial partners at the outset of the project to deal with emerging difficulties in a timely manner.
- 6. The programme's Senior Responsible Owner role still does not conform to Office of Government Commerce guidance.** The Department should review what prevents it moving to an arrangement which conforms more closely to Office of Government Commerce guidance and set out ways to redress the current shortfall as part of its Initial Gate submission.

7. **The Senior Responsible Owner does not have direct line management responsibility for some Programme Board members and must therefore work in part by influence and consensus.** The Department is confident that it can align incentives and reward good behaviour when individual Programme Board members have conflicting priorities. However, it did not explain persuasively how it would achieve this goal and should clearly set out how this can be done.

# 1 Making important decisions

---

1. The United Kingdom's ability to maintain continuous at sea deterrence is dependent on the seamless transition from the current Vanguard fleet to the future class of submarines. By 2024, two of the four Vanguard class submarines will have gone out of service and the first of the future submarines will need to be in service. The current critical path for the future deterrent programme is therefore delivery of the submarine platform in time to meet this deadline, although this plan also assumes the successful delivery of a five-year life-extension programme for the Vanguard class submarines.<sup>3</sup> Key timelines for the principal elements of the future deterrent are shown in **Figure 1**.

2. The Department has a long history of delivering major defence projects late. The Department's unrealistic assessment of project delivery timetables has often meant that major projects also frequently exceed their budgets. The current Astute submarine programme provides a good example of this, since it is already over three years late against its planned in-service date and around £1.3 billion over budget. This increase in expenditure constitutes a 47.3% cost overrun.<sup>4</sup>

3. The Astute submarine procurement programme has suffered from a range of problems, including slow contract negotiation, an ill-advised attitude to risk and difficulties with a computer-aided design tool. Furthermore, the length of time elapsed between the Vanguard and Astute programmes meant that key skills and submarine-building expertise disappeared. There has also been unplanned cost growth such as increases of £164 million and £68 million for materials and labour respectively.<sup>5</sup>

4. The Department understands that, if it is to avoid jeopardising continuous at sea deterrence, there is no room for the future deterrent programme to experience similar delays to the Astute programme. Although the current Vanguard fleet could be extended beyond the five years envisaged under the planned optimisation programme, any further extension of the current submarines is likely to add extra cost and risk.<sup>6</sup>

5. The Department has yet to make a number of key decisions, including finalising the principal design parameters of the submarine, the type of nuclear reactor and the design and size of the missile compartment.<sup>7</sup> The Department has until 2014 to decide whether to build three or four submarines.<sup>8</sup> At present, the Department believes that four submarines will enable the United Kingdom to maintain continuous at sea deterrence. A new design of submarine with increased reliability might allow the same level of coverage to be maintained with three submarines.<sup>9</sup>

---

3 C&AG's Report, para 1.8

4 Qq 18–19

5 C&AG's Report, Box 3

6 Q 4

7 C&AG's Report, para 2.8

8 Q 63

9 Q 46



6. The Department has yet to choose between using a variant of the existing ‘PWR2’ nuclear reactor and developing a new reactor—‘PWR3’—but intends to do so by September 2009, its Initial Gate approval milestone.<sup>10</sup> Both choices present opportunities as well as costs. The PWR2 model has the benefit of being based on existing technology, but will require updating because of the risk of obsolescence.<sup>11</sup> The PWR3 option offers the advantage of increased efficiency, but presents an added risk to the timeline as it requires a substantial amount of research and development.

7. The Department faces a difficult judgement in deciding how much options analysis work to undertake before settling on the key design features of the submarine. The Department is attempting to complete the submarine design and build process in 17 years, against the 18 year timetable which is generally accepted as necessary (including two years for concept, seven years for design, seven years for construction and two years for sea trials). The Department intends to manage this timetable misalignment by overlapping the design and construction phases. This approach will mean that construction will commence before the completion of submarine design.<sup>12</sup>

---

10 Q 76

11 C&AG’s Report, para 1.14

12 Qq 59–60

## 2 Managing dependence on the United States

---

8. The United Kingdom and the United States have a long history of collaboration on major defence projects.<sup>13</sup> Collaboration on various aspects of the United Kingdom's nuclear deterrent programmes has taken place under the auspices of the 1958 Agreement for Cooperation on the Uses of Atomic Energy for Mutual Defence Purposes and the 1968 Polaris Sales Agreement.<sup>14</sup>

9. In an exchange of letters in 2006, the Prime Minister and the President of the United States agreed that the United Kingdom would participate in the planned life extension programme for the Trident D5 missile and that close coordination should be maintained between the two countries. The United States has also agreed that any successor to the Trident D5 missile would be compatible with, or be capable of being made compatible with, the launch system that the United Kingdom will be installing into its new submarines.<sup>15</sup>

10. Despite these assurances, collaboration with the United States on the Trident D5 missile life extension programme presents significant risks to the United Kingdom's future nuclear deterrent. The new class of submarine is likely to remain in service beyond the extended life of the existing Trident D5 missile, which will be renewed in 2042, and must therefore be compatible with any successor missile developed by the United States.<sup>16</sup> Lack of coordination between the United States' missile design and the United Kingdom's future submarine design may cause the missile compartment to be incompatible with the extended D5 missile design. Any form of dislocation or delay in this collaboration process would have serious ramifications for the Department's ability to support a nuclear deterrent over the longer term.

11. The Department understands that there is a significant risk associated with being ahead of the United States. By seeking to have a shared design for its missile compartment, the Department has taken steps to reduce the risk of future incompatibility and is working with the United States to mitigate the immediate D5 missile compatibility risk.<sup>17</sup>

12. There is a general risk that wider political or economic factors could lead the United States Government to delay or even cancel their submarine construction programmes. Whilst unlikely, such an event would impose substantial costs on the United Kingdom if the Department chose to continue with its submarine programme without the assistance of the United States.<sup>18</sup>

---

13 *The Future of the United Kingdom's Nuclear Deterrent*, Cm 6994, December 2006

14 Q 27; C&AG's Report, para 1.12

15 Qq 5–6, 82

16 C&AG's Report, para 2.12

17 Q 27

18 Q 44

13. This programme, like others with international collaboration elements, is subject to exchange rate variations: in this case between the pound and the dollar. Given the long timelines involved, large exchange rate fluctuations could have a significant impact on the budget. In the short term, the Department has a rolling programme to buy foreign currency forward, which is intended to mitigate the risk over a three-year period. When the Department was calculating the costs of the collaborative elements of the programme, the United States dollar exchange rate was 1.82.<sup>19</sup> If the dollar remained at the level it reached in November 2008, the Department calculated that the additional costs to the future deterrent programme would amount to around £300 million.<sup>20</sup>

14. Close collaboration and ongoing discussions with the United States therefore remain critical to the successful delivery of the United Kingdom's future deterrent. The Department is confident that several factors, including the 1968 Polaris agreement, the exchange of letters between the Prime Minister and the President, and the current high levels of cooperation between the two countries provide reasonable assurance that it is doing what it can to mitigate the risk.<sup>21</sup> The Department is also designing a communications plan to ensure that the United States receives consistent messages from its various teams.<sup>22</sup>

---

19 Q 28

20 Q 29

21 Q 82

22 C&AG's Report, para 3.24

### 3 Managing the programme effectively

---

15. The Strategic Deterrent Programme Board, which is responsible for coordinating delivery of the future deterrent within the Department, is chaired by the Senior Responsible Owner. The Senior Responsible Owner's responsibilities include establishing the requirements for the future deterrent capability, leading policy advice and allocating the budget for most elements of the future submarine, Trident D5 missile life-extension and Atomic Weapons Establishment facilities and skills investment programme.<sup>23</sup>

16. The Board is composed of senior Royal Navy officers and civil servants, who are responsible for the principal projects within the future deterrent programme.<sup>24</sup> The Foreign and Commonwealth Office, the Cabinet Office and the Treasury also attend the board, ensuring that those government departments are also involved in decision-making. There is widespread agreement that the Board includes the right people. **Figure 2** shows the position of the Board in the context of the Ministry of Defence's overall programme governance arrangements.<sup>25</sup>

17. To date, the Strategic Deterrent Programme Board has not been required to make difficult decisions or trade-offs, primarily because the programme has not reached the stage at which key decisions would be needed.<sup>26</sup> Given that the Senior Responsible Owner does not have direct line management authority over the other members of the Board, it is not clear how the Department can incentivise Board members to deal with these key decisions in a cohesive manner when they have conflicting priorities.

18. Although the Senior Responsible Owner is supported by a full-time Director and supporting staff, his remains a part-time appointment. The incumbent is also the third person to hold the position since the start of the programme.<sup>27</sup> The Senior Responsible Owner role still does not conform to the Office of Government Commerce guidance, the importance of which was emphasised in the Committee's Report on the Bowman programme,<sup>28</sup> although the Department accepts that governance arrangements may evolve and simplify as the programme progresses from concept to delivery phases.<sup>29</sup>

19. The Programme Board does not have a mature performance information system. At the beginning of the project the Board received too much information with little data consistency. In response, the Department created a performance measurement prototype that the board are currently reviewing. The Department is confident that a fully functional process will be in place by September 2009.<sup>30</sup>

---

23 C&AG's Report, para 3.6

24 C&AG's Report, para 3.8

25 Qq 8, 51

26 Qq 49–50

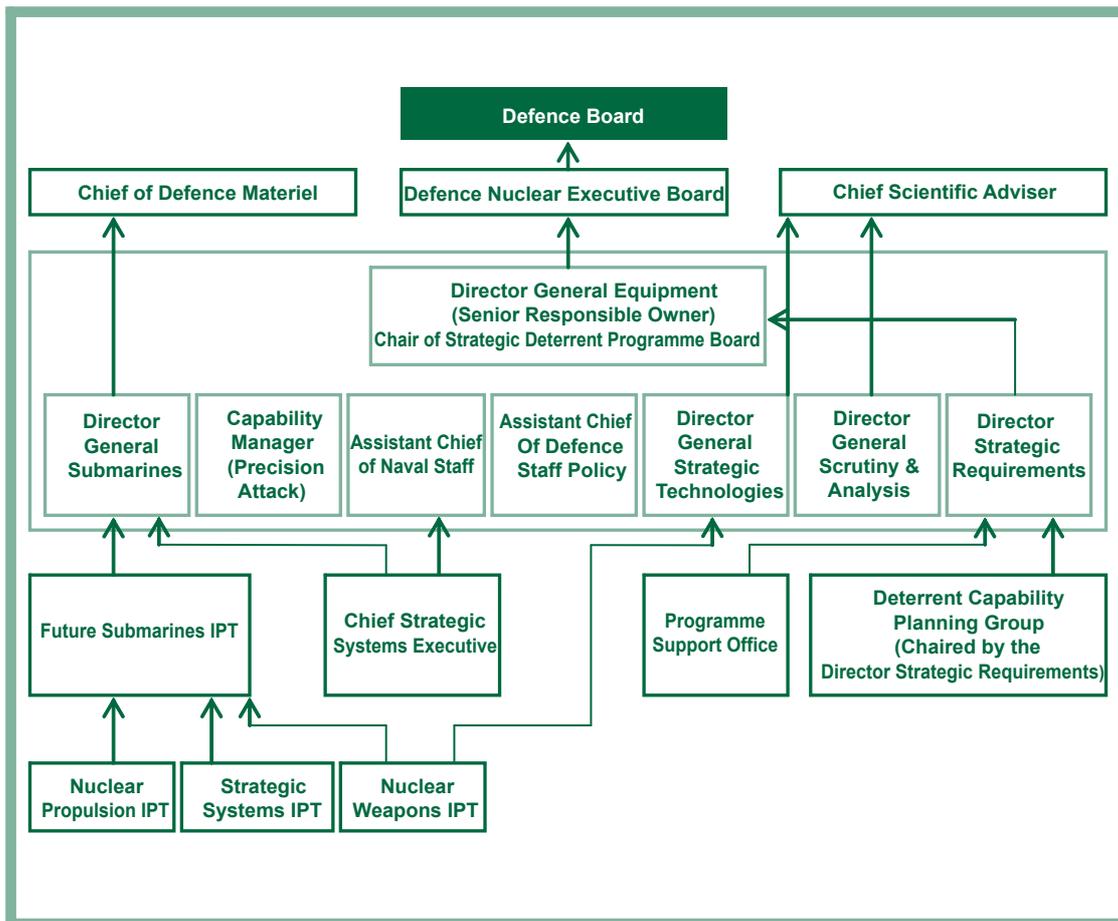
27 Qq 8, 77–78

28 Committee of Public Accounts, Fourteenth Report of Session 2006–07, *Ministry of Defence: Delivering digital tactical communications through the Bowman CIP Programme*, HC 346, para 1

29 Q 9

30 Q 56

Figure 2: The future deterrent programme governance arrangements



Source: Ministry of Defence

#### NOTE

Posts in the central box are members of the Strategic Deterrent Programme Board. This figure is not intended to and does not necessarily reflect normal line management relationships

20. The Department has not yet refined its White Paper cost estimates. These estimates are therefore still not robust enough to provide an accurate baseline against which to measure progress and exercise budgetary control. The Department is committed to delivering refined cost estimates by September 2009.<sup>31</sup> At this stage the Department should have more information about each of the designs, making it easier to allocate cost to the different estimates.<sup>32</sup>

21. The Department's Defence Industrial Strategy emphasises the importance of maintaining submarine and nuclear reactor building capability in the United Kingdom.<sup>33</sup> Given that this sector is highly specialised and characterised by monopoly suppliers, the Department faces a challenge in obtaining value for money over the whole life of the programme. The Astute and future deterrent programmes should however provide some continuity of work and the Department is keen to use the leverage gained through these

31 Q 10

32 Q 69

33 *Defence Industrial Strategy*, Cm 6697, December 2005

programmes to encourage the submarine industry to restructure, drive costs down and to be open and transparent about cost.<sup>34</sup>

# Formal Minutes

---

**Monday 9 February 2009**

Members present:

Mr Edward Leigh, in the Chair

Mr Richard Bacon  
Angela Browning  
Rt Hon David Curry  
Mr Nigel Griffiths

Rt Hon Keith Hill  
Mr Austin Mitchell  
Rt Hon Alan Williams

Draft Report (*The United Kingdom's Future Nuclear Deterrent Capability*), proposed by the Chairman, brought up and read.

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

Paragraphs 1 to 21 read and agreed to.

Summary read and agreed to.

*Resolved*, That the Report be the Eleventh Report of the Committee to the House.

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

*Ordered*, That embargoed copies of the Report be made available, in accordance with the provisions of Standing Order No. 134.

[Adjourned till Wednesday 11 February at 3.30 pm]

## Witnesses

---

**Wednesday 19 November 2008**

*Page*

**Sir Bill Jeffrey KCB**, Permanent Under Secretary of State, **Dr Paul Hollinshead Bsc (Hons), PhD, MBA, OBE**, Director Strategic Requirement, **Mr Guy Lester**, Director General Equipment, and **Rear Admiral A D H Mathews CB**, Director General Submarines, Ministry of Defence

Ev 1

## List of written evidence

---

Ministry of Defence

Ev 16

## List of Reports from the Committee of Public Accounts 2008–09

---

First Report	Defence Information Infrastructure	HC 100
Second Report	The National Programme for IT in the NHS: Progress since 2006	HC 153
Third Report	Skills for Life: Progress in Improving Adult Literacy and Numeracy	HC 154
Fourth Report	Widening participation in higher education	HC 226
Fifth Report	Programmes to reduce household energy consumption	HC 228
Sixth Report	The procurement of goods and services by HM Prison Service	HC 71
Seventh Report	Excess Votes 2007–08	HC 248
Eighth Report	Ministry of Defence: Chinook Mk 3	HC 247
Ninth Report	Protecting the public: the work of the Parole Board	HC 251
Tenth Report	New Dimension—Enhancing the Fire and Rescue Services' capacity to respond to terrorist and other large-scale incidents	HC 249
Eleventh Report	The United Kingdom's Future Nuclear Deterrent Capability	HC 250
Twelfth Report	Selection of the New Comptroller and Auditor General	HC 256

# Oral evidence

## Taken before the Committee of Public Accounts

on Wednesday 19 November 2008

Members present:

Mr Edward Leigh, in the Chair

Mr Richard Bacon  
Mr Paul Burstow  
Mr David Curry  
Mr Ian Davidson

Nigel Griffiths  
Keith Hill  
Mr Austin Mitchell  
Mr Alan Williams

**Mr Tim Burr**, Comptroller and Auditor General, **Mr Jim Rickleton**, Assistant Auditor General, and **Mr Tim Banfield**, Director, National Audit Office, gave evidence.

**Mr Marius Gallaher**, Alternate Treasury Officer of Accounts, HM Treasury, was in attendance.

### REPORT BY THE COMPTROLLER AND AUDITOR GENERAL

#### THE UNITED KINGDOM'S FUTURE NUCLEAR DETERRENT CAPABILITY (HC1115)

*Witnesses:* **Sir Bill Jeffrey**, KCB, Permanent Under Secretary of State, **Dr Paul Hollinshead**, BSc (Hons), PhD, MBA, OBE, Director Strategic Requirement, **Mr Guy Lester**, Director General Equipment, and **Rear Admiral A D H Mathews**, CB, Director General Submarines, Ministry of Defence, gave evidence.

**Q1 Chairman:** Good afternoon. Welcome to the Committee of Public Accounts. Our hearing today is on the Comptroller and Auditor General's Report on the United Kingdom's future nuclear deterrent capability. We welcome back to our Committee Sir Bill Jeffrey, who is the Permanent Under-Secretary with the Ministry of Defence, Guy Lester, who is the Director General Equipment and Senior Responsible Owner of the future deterrent programme, Rear Admiral Andrew Mathews, Director General Submarines, and Dr Paul Hollinshead, who is the Director Strategic Requirement. You are all very welcome. This is a somewhat unusual hearing for us. I suggested to the Comptroller General that I think it would be a good idea to do this programme in good time, almost in advance, so that the Committee of Public Accounts over the next 15 years or so can keep a track of what is happening. I think this is a useful exercise. I appreciate we are in the early stages. Sir Bill, given your experience with the Astute submarine, if we look at box three, "Problems associated with the Astute submarine programme . . . ", we see there that it was hugely over-budget, 40% over budget. It has slipped by three years. How are we going to avoid the same problems occurring with the Trident replacement system?

**Sir Bill Jeffrey:** Although, as you say, it is unusual for your Committee to tackle a project like this as early as this, I never thought I would hear myself say this but we very much welcome this as well. Of course, the Astute project is one of those longstanding projects in our portfolio which have been very much delayed and subject to cost growth. In a short answer to your question, we feel we have learned the lessons of that. In a slightly longer answer, if you look at box three, the reasons for why Astute went wrong—slow contract negotiations and

over-estimation of how much risk we can realistically transfer to our suppliers, problems with the computer assisted design and crucially—I think my colleagues would endorse this—the loss of key skills and the gap between the end of the Vanguard class and the beginning of the Astute class—in each of these areas I think we are well aware of the risks. We believe we are managing them effectively.

**Q2 Chairman:** You cannot make a mistake on this, can you, because your existing submarines run out of time in 2024. Your existing submarines apparently have not missed a day since 1968.

**Sir Bill Jeffrey:** That is correct.

**Q3 Chairman:** There has not been a single gap in our nuclear deterrent. It is not like other defence systems where you can patch them up; you can put them to sea and hope for the best. You have to have these new submarines in perfect condition. Sixteen years sounds a lot of time, does it not, but it is not a lot, is it, for a submarine of this complexity?

**Sir Bill Jeffrey:** There was some question, at the time of the White Paper and the parliamentary debate, as to whether the decision was in fact being taken too early. We have felt throughout that time is quite tight, although as you say, Chairman, it seems a very long way off. The thinking in the White Paper and in all our planning at the moment is that we can extend the Vanguard class by five years which would be quite a normal period of extension. It is quite possible that it could be extended for longer.

**Q4 Chairman:** When could you conceivably extend it to?

**Sir Bill Jeffrey:** I could not say. We are looking at it. What I was about to say was that any further extension would inevitably involve extra cost and

---

 Ministry of Defence
 

---

risk. The thing about these very complex nuclear submarines is that the longer you keep them in service the more out of service they need to be for purposes of maintenance etc. The short point is that we are not banking on any extension beyond the five years. All of our efforts at the moment are driven by the 2024 in service date.

**Q5 Chairman:** One of the big risks is in the missile programme, is it not? That is in US hands and that apparently relies on exchange of letters between President Bush and Prime Minister Blair. Obviously they are no longer with us.

**Sir Bill Jeffrey:** President Bush is, I think.

**Q6 Chairman:** The US is not planning to finalise the design of the shared missile compartment until after we need to finalise the design of our submarines. How can we meet the timetable? Is there going to be a problem there?

**Sir Bill Jeffrey:** This is why the discussions between us and the Americans before the White Paper was published and since then are so important. We are joining with the Americans—and part of the exchange of correspondence was the President agreeing to our doing so—in the plans to extend the life of the D5 missile to around 2042, when the US Ohio class submarines are due to go out of service. Because of the phasing of the introduction of the next generation of our deterrent submarines, that will be part way through their lifetime, so we need as good an assurance as we can have that the decision the Americans may eventually take on the successor to the D5 missile does not leave us with compatibility problems. In that correspondence, I think there is as good an assurance as we could have that, in the language of President Bush's letter, we would have the option of participating in any future missile programme. Any successor to the D5 would be compatible or capable of being made compatible with the launch system that we will be installing into our successor deterrent.

**Q7 Chairman:** Now may I ask questions about Senior Responsible Owners? This is very important because in our 2007 Report on Bowman we recommended “that the Department should equip Senior Responsible Owners with the funding, authority and trust to fully discharge their responsibilities” but if we look at paragraphs 3.5 and 3.6 of the Comptroller's Report we see that under current arrangements, Director General Equipment, in his role as Senior Responsible Owner, does not have direct line responsibility. Indeed, your Senior Responsible Owner—he can answer himself if he wishes, rather than you—does not have direct line management responsibility. He is part time and he is the third one in 18 months. This does not fill me with confidence, Sir Bill.

**Sir Bill Jeffrey:** First of all, I think he does have authority in our organisation. In the MoD, the natural place to locate the ownership of these big projects is in the area at the centre. You will recall receiving evidence from General Andrew Figgures, the equipment capability owner. Guy Lester on my

left reports to General Figgures and is a very senior official in the equipment capability area. He has the authority of the Defence Board and has access to myself and to the Chief of Defence Materiel, if he needs it.

**Q8 Chairman:** He is the third one in 18 months.

**Sir Bill Jeffrey:** That is regrettable. It is a consequence of staff changes, but I have no plans for the moment to change the occupant of the post for some time to come. Although the role is not full time, it is supported by a full time one star, Dr Hollinshead on my right, the Director Strategic Requirement, and since earlier this year by a programme support office which is well placed to bring together all the various elements of the nuclear deterrent. This may change over time because at the moment we are still at a stage where I am attaching a lot of importance to the wider network of relationships that somebody at the centre needs to have with other people in government. This is, for the moment at least, not just an MoD project; it brings in the Foreign Office and it also involves—

**Q9 Chairman:** I want to ask you about that. This is mentioned in paragraph 3.2 where agreement with the Cabinet Office is involved and the Foreign Office. Who ultimately takes the big decisions? Where does the buck stop? Is it you? Who is responsible to us for this thing if it goes over time or over budget? Presumably it is you?

**Sir Bill Jeffrey:** That is me. I am responsible to this Committee as I am for all expenditure within the Department. The big decision clearly was the one taken at the time of the White Paper and that was taken by the Prime Minister and his Cabinet colleagues of the day. There is still an extent to which this programme, because it resonates in the way that it does and brings in issues of foreign policy as well as purely defence issues, is of interest to Number 10, the Cabinet Office, the Foreign Office and others. We certainly need an SRO positioned at the centre of the organisation who can see not only all the MoD connections and have effect on them; but who also is well placed to plug into other parts of Whitehall. What I would say—and the NAO Report rather brings this out—is that as we move gradually from policy to concept to delivery I can certainly see the governance arrangements evolving and becoming a bit simpler than the diagram that the Report includes.

**Q10 Chairman:** I was worried to read in paragraph 4.5 that your Department accepts that the White Paper cost estimates are not sufficiently robust to provide an accurate baseline against which progress can be measured and a sufficiently detailed cost model which can be used to manage cash flow. When are your costs and timescale estimates going to be accurate enough for us to be able to measure progress?

**Sir Bill Jeffrey:** The cost estimates in the White Paper were there because it seemed essential in terms of public confidence to be giving a broad indication of what we thought this programme would cost.

---

 Ministry of Defence
 

---

They are now being refined and part of the intensive work that is going on now is to refine them as we understand better the design of the successor deterrent. When we come to the point of Initial Gate, which is expected to be next autumn, we intend to have a better take on costs.

**Q11 Chairman:** These estimates are being refined, not transformed?

**Sir Bill Jeffrey:** Refined, I would say, yes.

**Q12 Chairman:** Trident came in on budget, did it not, but it was a much bigger US element and there was an exchange rate working in our favour. You cannot rely on this sort of thing, can you?

**Sir Bill Jeffrey:** We cannot.

**Q13 Chairman:** There are many imponderables.

**Sir Bill Jeffrey:** We must find what we can in this area. The fact is that Trident did come in, broadly speaking, to cost and on time.

**Q14 Chairman:** You have many commercial challenges. These are dealt with in 5.7. The trouble is that your contractors know exactly how much money you have. They know that it has to come in by a certain date. They have you over a barrel, have they not?

**Sir Bill Jeffrey:** I would not put it as starkly as that. It is certainly the case that the defence industrial strategy makes it clear that these are assets that we would want to generate and retain onshore in the United Kingdom. As you have just observed, the White Paper gives a ballpark estimate of costs. The conclusion I would draw from that is that we must recognise that we are dealing with essentially monopoly suppliers. We have to work very hard to find other ways of achieving value for money. We are not in the business of doing this at any cost. If you look at the evidence that we submitted to the Defence Committee a little while ago, we made it clear that we would expect any commitment by the government to a long term submarine build programme to be matched by a commitment by the industry to rationalise and reduce costs. It is not straightforward but we have to acknowledge that we are in the position we are in and all the effort needs to be directed at getting the best deal we can.

**Q15 Nigel Griffiths:** This project has already had its first delay. It is six weeks late. Is this setting a pattern?

**Sir Bill Jeffrey:** I do not personally recognise the six week delay figure.

**Rear Admiral Mathews:** It is a six week delay to the concept phase, because we were slow standing up the project team. We had absolutely clear instructions that we were to only do that once the decision had been made in Parliament to proceed. We are now holding programme and our intention is to catch up by the time we get to Initial Gate.

**Q16 Nigel Griffiths:** I am concerned that 2.7 is clear. "During 2008 the concept phase slipped by six weeks." You do not recognise this. How late was the project's sister programme, the Astute submarine?

**Sir Bill Jeffrey:** At the equivalent stage?

**Q17 Nigel Griffiths:** Now. How late is it?

**Sir Bill Jeffrey:** As the Report brings out, the Astute is much delayed. The original ISD for the first Astute boat was June 2005 and we are currently forecasting later this year, I think.

**Q18 Nigel Griffiths:** When the Report was published, it was three years five months. Now that looks like three years six months/seven months. What has been the overspend on this sister programme on the Astute?

**Sir Bill Jeffrey:** First of all, I should correct an error into which I slipped a moment ago. It is not later this year; it is during the course of next year that we are expecting the first Astute boat to be in service. The cost at approval for Astute in 1997 at current prices at that time was about £2.5 billion for the first three boats and the current estimate is £3.8 billion.

**Q19 Nigel Griffiths:** That is a 47.3% cost overrun and a three years six months or so delay. Can you go to table two on page 12? Can you tell the Committee what the impact of that delay of three years five or six months would be likely to be on that time line?

**Sir Bill Jeffrey:** If we had such a delay, it clearly would impact very severely on our time line. As the Chairman's opening question illustrated, we are currently driving as hard as we can towards 2024. As I said in my response to him, we believe that the lessons of the Astute programme are ones that we have learned and ones that the general commercial and procurement approach we are taking to this are capable of addressing successfully.

**Q20 Nigel Griffiths:** If that took this programme to 2027 or beyond, how would you plug the gap?

**Sir Bill Jeffrey:** I am very reluctant, if I may say so, to reply to a hypothetical question because we are not planning to suffer that sort of slippage. As I said at the beginning, it is conceivable that the Vanguard class could be further extended beyond 2024 but we are not counting on it. There is work going on at the moment to assess what the implications would be were it to prove necessary so to extend it.

**Q21 Nigel Griffiths:** I cannot imagine you ever saying that you were counting on it. What sort of problems has the Ministry had bringing in major projects on time?

**Sir Bill Jeffrey:** We have had the problems with Astute that you alluded to earlier.

**Q22 Nigel Griffiths:** How late was the type 45 destroyer?

**Sir Bill Jeffrey:** The type 45 destroyer also is one of these projects that has suffered significant delay over time.

---

 Ministry of Defence
 

---

**Q23 Nigel Griffiths:** How late is the Nimrod maritime reconnaissance aircraft?

**Sir Bill Jeffrey:** Ditto. I accept that.

**Q24 Nigel Griffiths:** I think that was seven years. The question is hardly hypothetical. There would be concern that if you go beyond 2024, which seems to me to be a tight deadline, we would no longer be able to operate our defence strategy with a nuclear submarine in the way that you are planning. What would we do?

**Sir Bill Jeffrey:** It is not a hypothetical question. In relation to Astute, by some way the most significant factor, as I understand it, was the substantial loss of skills between the end of Vanguard construction and the commencement of the Astute programme. A great deal of our problems are down to that and to an unrealistic view of how much risk we could transfer to suppliers. The fact that we are now for example taking over responsibility for the design ourselves, adopting a more hands on approach—and this is beginning to improve the Astute position in recent times—adopting a more active partnership approach with the company gives us some grounds for optimism that we can do much better this time. Let us not forget that Vanguard itself was delivered on time and to cost.

**Q25 Nigel Griffiths:** Let us go on to Vanguard. If I can expand on one of the answers you gave to the Chairman, Vanguard came in in 1994 with what should prove to be a 30 year life span. Is that right?

**Sir Bill Jeffrey:** Twenty-five years was the original, projected life span but we are now talking about a five year extension.

**Q26 Nigel Griffiths:** If I extend my logic, that will give you the benefit of the doubt. What you are saying in terms of the Ohio class going out of service then is that, around about two thirds of the way through Vanguard's replacement lifetime, the Americans are going to bring in a new system.

**Sir Bill Jeffrey:** That is, broadly speaking, the position.

**Q27 Nigel Griffiths:** What happens if we make a design breakthrough and require a larger or smaller replacement for the Trident D5? Larger, I presume, it could not launch. Can it launch a smaller missile?

**Sir Bill Jeffrey:** There are two broad answers to that. The first is the one I gave the Chairman earlier, which is that at the highest political level we have an undertaking about compatibility prospectively. The second is that in recent months—and I have been involved to a degree myself in these—there have been discussions with the Americans about work together on a common missile compartment which ought to derisk this issue in the slightly longer term.

**Rear Admiral Mathews:** One of the enduring strengths of this programme has been our relationship with the Americans on the missile system, whether it is Polaris, Trident or into the future with this system. Both countries recognise that. As you rightly point out, the significant risk of being ahead of the Americans is one we have to

manage. The Americans have brought forward their Ohio replacement programme<sup>1</sup> to align the dates with ours now and we are currently working on what we call a common missile compartment design. We are going through the approvals process in the UK at the moment, just as the Americans are going through the approvals process the other side of the Atlantic. Our aim is to deliver a common missile compartment to service both submarines. What we are looking to do is future proof beyond that 2042 date, if there is a decision to change from the Trident D5 life extended missile to another generation missile. Both countries will have identical missile compartment designs and be able to take that future missile design, whenever it is. One of the things we are looking at in that design is what flexibility we need to incorporate into it.

**Q28 Nigel Griffiths:** What was the exchange rate when you costed the elements of this programme that the Americans are involved with or that we are buying from America?

**Sir Bill Jeffrey:** I do not know offhand.

**Mr Lester:** 1.82<sup>2</sup>.

**Q29 Nigel Griffiths:** How much has this fall now pushed up the costs? Can you update the Committee on that?

**Mr Lester:** We do a degree of buying forward of foreign exchange anyway which mitigates the risk over the next three years or so. That is a rolling buying forward programme. If over the course of the programme it just stuck at where it was today, it would add £300 million-odd to the overall cost of the programme.

**Q30 Mr Curry:** You will understand if we are tempted to say that the motto over the Ministry of Defence door should be “Everything that can go wrong does go wrong”, looking at the procurement programmes that Mr Griffiths has mentioned. The motto on this programme seems to be “Nothing can go wrong because, if anything goes wrong at all, then the whole programme becomes much more difficult.” Is that a fair assessment?

**Sir Bill Jeffrey:** I do not think so. I do not think the first part is true either. We have some well advertised procurements which have gone badly wrong and this Committee has been involved in them in recent years. I will never be one to defend the indefensible. On the other hand, if you look at the programme as a whole, we are delivering at the moment 350 equipment projects, about 300 urgent operational requirements and, in that much wider population of unremarkable programmes, our performance is a great deal better. I would just gently contest the statement that everything that can go wrong does go wrong.

---

<sup>1</sup> *Note by witness:* The US have brought forward that element of the Ohio programme relating to development of the common missile compartment, to align with our timescales. The timing of the wider Ohio programme is a matter for the US Government.

<sup>2</sup> *Note by witness:* The average rate assumed was 1.8

---

**Ministry of Defence**


---

**Q31 Mr Curry:** This is a very particular programme, is it not? This is a programme first of all which is wholly dependent upon American cooperation. Okay, there has been an exchange of letters but we are dependent on the Americans for key pieces of kit. We are also dependent on the Americans for the progress of their own development programme and its synchronisation or compatibility with ours. There could be dislocation there, could there not?

**Sir Bill Jeffrey:** We have an independent deterrent in the sense that it is independently operable by decision of our Prime Minister. Having said that, as you observe, we are very much dependent on the Americans for the development and support of it. That is a close and, in my experience, very deeply collaborative and worthwhile relationship from which we get cost benefit as well as military benefit.

**Q32 Mr Curry:** The job of this Committee is not to speculate upon the possibility of the Prime Minister ever exercising that independence; it is to focus on the costs of building the kit. You are 60 or about to be 60, I think?

**Sir Bill Jeffrey:** I am already.

**Q33 Mr Curry:** Some of us think 60 is quite a young age. I assume that you are not far from retirement. Is that the case?

**Sir Bill Jeffrey:** Not very far, no.

**Q34 Mr Curry:** As you know, when diplomats leave their posts, they write a confidential letter to the Minister. If your Minister said, "Sir Bill, you are going and I would like you to leave to your successor something which warns him of all the key things that could go wrong, just in the interests of making sure that your successor eases into service and is informed", what would be the key things? What keeps you awake at night?

**Sir Bill Jeffrey:** Fortunately, very little keeps me awake at night. I think this Report which we have in front of us is a very clear account of what could go wrong. To answer your first question, the Department's position is not that this is the programme in which nothing can go wrong. We are acutely conscious of the risks that are involved in this programme. They are set out comprehensively in this Report. The principal task of the gentlemen on my right and left and me some of the time is to ensure that we manage these substantial risks as effectively as we can.

**Q35 Mr Curry:** There is one point here at which my eyes slightly begin to glaze. There is quite a big section on Astute but we are going to have to build a submarine to carry these missiles, are we not, a Vanguard replacement?

**Sir Bill Jeffrey:** Yes.

**Q36 Mr Curry:** Where is that submarine in terms of conception? In whose eye is it a spark?

**Sir Bill Jeffrey:** Principally, the project we are examining is the successor submarine.

**Q37 Mr Curry:** But we do not have one yet, do we?

**Sir Bill Jeffrey:** We are in the design phase of it, the concept phase.

**Q38 Mr Curry:** Whereas the Astute at least exists, however late it is, meanwhile waiting for the Astute all the Trafalgar class are being absolutely clapped out and knackered, both boats and crew. We do not yet have a replacement for Vanguard. There is nothing to look at yet.

**Sir Bill Jeffrey:** There certainly is not. One of the strengths of our position—and I acknowledge that there are some weaknesses—is that the current intention is to build what remains of the Astute class, which has a different purpose, as you know, from the Vanguard, in the period between now and the commencement of building the Vanguard successor.

**Q39 Mr Curry:** Is there any read over from the Astute?

**Sir Bill Jeffrey:** One of the things we are trying to do in an effort to derisk this is to maximise the read over and to learn as much—

**Q40 Mr Curry:** The new boat is a completely new boat, as it were. It is not a stretched Astute.

**Sir Bill Jeffrey:** It is going to be a development of everything that has preceded it. One of the things we are doing is to manage the design phase in such a way as not to design in things that will make it harder and more protracted to realise.

**Q41 Mr Curry:** If you were a betting man, would you say that we would seek to extend the already intended extension of the Vanguard class life?

**Sir Bill Jeffrey:** I am not a betting man. I am an elderly Permanent Secretary.

**Q42 Mr Curry:** You have held some fairly sticky jobs. Somebody who has worked in immigration and the prison service, I would have thought, must be a betting man to have got that far. We are going to try and extend it, are we not, because we always do?

**Sir Bill Jeffrey:** I meant what I said at the beginning. It is not inconceivable that it could turn out to be extendable, but we cannot count on that. Therefore, the guys who are doing this day by day as their day job are working to 2024. That is the clear instruction they are operating under.

**Q43 Mr Curry:** The reason I ask the question is that at the moment in the Trafalgar class for example tours of duty are longer than was originally intended. They come back into port and, because the facilities and expertise are no longer there in the civilian workforce, crews are being kept there to help deal with maintenance. My son served on one for many years so this is first hand information. The boats are clapped out. The crews are clapped out. Because the contract at the heart of it, that you got back to shore and then you went home for quite a long leave, has broken down, marital relationship breakdown is higher than it used to be in the service.

---

 Ministry of Defence
 

---

When you start extending boats which are getting elderly and tired, I fear that the collateral damage becomes quite considerable.

**Sir Bill Jeffrey:** That is certainly one of the factors. These are extremely complicated vessels. Our experience is that things start to go wrong the longer you operate them.

**Rear Admiral Mathews:** I do not recognise the picture you paint. The Trafalgar class continues to operate in exactly the same way as we have operated it since it came into service. The way we maintain them has changed little. The contractor who now delivers that maintenance is Babcock Marine who bought out DML. We changed the company. They are older. We are operating the oldest set of submarines that we have ever had, so I fully accept that point.

**Q44 Mr Curry:** We are not here to discuss the Astute, although it features quite centrally in this and makes us somewhat uneasy. We are heavily dependent from the point of view of the kit on the United States. There is a reactor issue and then there is the issue about the timing of their submarine development. Because their submarines were designed for a longer life than ours, we are now at a point of slight dislocation in relationships. If I say, "How concerned are you?" you are bound to say that you are not concerned because you have a very close working relationship with the Americans. Things could go wrong. It might not be us that make things go wrong. There could be things that go wrong because of the interdependence. At some stage politics are going to intrude there as well, are they not? We are all facing very difficult economic circumstances and one of the things people tend to do is to let slip orders, push back orders and push back procurement, to defer things. How confident are you that this commands such priority on both sides of the Atlantic that it would not be subject to that?

**Sir Bill Jeffrey:** I am confident in the assurances we have and in the quality of the collaboration we have with the Americans. I nonetheless accept, as you say, that we are talking about long time spans here during which situations could change. It is undoubtedly the case, to take an extreme example, that if the Americans ever decided to get out of the submarine deterrent business altogether that would impose substantial costs on us if we wanted to continue. It does not seem very likely to me and at the moment I think we have to operate on the basis of the very high level of cooperation that we have and the assurances, which I think are serious, long lasting assurances, that we have received.

**Q45 Mr Curry:** I understand the decision has not yet been taken as to whether we need three or four submarines. Is that correct?

**Sir Bill Jeffrey:** That is correct.

**Q46 Mr Curry:** That must have huge implications in operational terms as to whether we have three boats or four boats. If we were to decide to have three

boats rather than four boats, what is the collateral there in terms of the demands upon the boat and the crew?

**Sir Bill Jeffrey:** The starting point is the policy which the White Paper sets out of doing what the Chairman said at the beginning of the session, which we have been doing since 1968, which is to provide what is known in the trade as continuous at sea deterrence. To do that at the moment, we judge we need four Vanguard class submarines because there is always one out of action for one reason or another for reasons that are explained in the papers. It is possible, depending on how reliable the design turns out to be, that in the next generation it would be possible to provide that sort of cover with three rather than four, but we do not know yet.

**Q47 Mr Curry:** Can you tell at the design stage? The decision will have to be taken before you build the fourth boat, will it not? Will you have enough operational experience then to be able to tell?

**Sir Bill Jeffrey:** The intention is to make the decision much earlier than that.

**Q48 Mr Curry:** Exactly, so nothing will be operational before you take that decision.

**Sir Bill Jeffrey:** Nothing will be built before that decision.

**Q49 Keith Hill:** I would like to focus on risk area three in the NAO Report on governance arrangements and therefore to put some questions about management and communications within management. Sir Bill, on page 22, box six notes that the Programme Board has not yet been required to come to agreement over difficult decisions or trade-offs. What would you say it has achieved so far?

**Sir Bill Jeffrey:** The Programme Board is chaired by the SRO and, if you will forgive me, I might ask him to say something about what the Programme Board has done so far.

**Mr Lester:** The Programme Board provides direction to the programme when direction is needed and takes decisions when there are particular decisions to be taken. In the run up to Initial Gate next autumn, there will be a range of decisions to be taken. We are coming up to one on the specifications of the common missile compartment and then the next big issue is the design of propulsion plant which will go into the new submarines. It just so happens that up to now we have not come across one of these big decision points, which is why the Programme Board has not taken a decision. It is not a reflection on the Programme Board; it is just that we have to reach the milestones before the decisions are taken. We then provide advice to the Defence Board.

**Q50 Keith Hill:** The two decisions you are about to take, you say, are on the missile compartment and propulsion. How are things panning out in relation to those decisions?

**Mr Lester:** On the missile compartment, they are panning out fine in the sense that we are in negotiation with the Americans. Our requirements are converging and we hope very early in the new

---

 Ministry of Defence
 

---

year to reach an agreement with the Americans both on our financial contribution and on the exact specification of the missile compartment to provide us with the long term guarantee of compatibility that Sir Bill was talking about earlier. On the propulsion plant, that is from my point of view the most tricky issue we have to deal with in the run up to Initial Gate, which is having enough evidence to judge the trade-off between initial costs, through life costs and risk to programme schedule between the different propulsion options that we are looking at.

**Q51 Keith Hill:** You chair the Programme Board. Who are the other members of the Board?

**Mr Lester:** We have the Assistant Chief of Defence Staff (Policy), who is the policy leader in this area in the Ministry of Defence; the Assistant Chief of the Naval Staff, who is responsible for delivering the in-service deterrent and also the manpower for the future deterrent. There is Admiral Lambert, who is Capability Manager for precision attack. He is one of my colleagues in the equipment organisation who is the lead on submarines. We have the Director General Scrutiny, who is in charge of scrutiny for all equipment programmes. We have Admiral Mathews himself of course and the Chief of the Strategic Systems Executive, who is a newly appointed two star admiral who has just literally come into the job. We have representatives from the Foreign Office and the Treasury and the Cabinet Office. In that sense, it is a stakeholder management forum but also a forum where all the people running the individual lines of development are represented.

**Q52 Keith Hill:** No reflection on yourself—as the Permanent Secretary said, you are a senior official yourself—but these are all pretty high powered characters. The NAO tells us that you do not have line management responsibility for the other members and you have to work by influence and consensus. One wonders how viable is that approach in the long term against the very demanding timetable we have been talking about.

**Mr Lester:** To be honest, I think the Report slightly overplays the influence and consensus point. In MoD jargon, it is basically a two star committee so most of us are at the same kind of level. What I do have authority over is resource allocation. That is one of the strengths of the job, sitting in my current post, because I allocate the money for the vast majority of the future deterrent programme, both for the submarines and for the weapons and the work at Aldermaston. I am quite clear that I am appointed by Sir Bill. I am answerable to the Defence Board and I am responsible for the advice that goes up to the Defence Board. It does not need to be a consensus body. A lot of these decisions are taken at very high level, either by the Board and by ministers inside the MoD or at prime ministerial level, but I do not feel obliged to harangue all these different people in the room until we reach a common view about things. I will put advice up and that is my responsibility.

**Q53 Keith Hill:** If push came to shove, you would harangue them, would you?

**Mr Lester:** Yes, indeed. My job is to keep the decisions on time to allow us to reach Initial Gate next September. That is my task for the next year. My job is to unblock problems, whether it is problems with particular strands of the business, whether it is financial problems. We have already had some issues over the last few months where, for the work to go ahead on a particular part of the programme, there was not enough money, so I had to make the money available for it. It is keeping the show on the road really. That is the key role of the Programme Board.

**Sir Bill Jeffrey:** One of the problems—and this is an issue in this Committee that we have discussed a number of times—is how we deal with the question of the Senior Responsible Owner. The list of participants in the Programme Board that Guy Lester has just given is illustrative of how many different parts of the Ministry of Defence have a stake in this. If you were to have somebody who was the boss of all of them, it would either have to be the Chief of the Defence Staff or me because the structures and the number of internal stakeholders are such that the best thing I think one can do is to identify somebody who is well placed by virtue of position and authority to perform the sort of task that Guy has just described.

**Q54 Keith Hill:** Can I now move on to what I take to be the issue of measuring progress in the Board, which is presumably this concept of performance metrics. What are performance metrics?

**Mr Lester:** The metrics are things like: to what extent are we meeting the requirement; to what extent are we meeting the milestones for the programme; to what extent are we meeting our financial targets. We are refining those metrics at the moment. They are metrics that the Board will use to judge whether remedial action has to be taken because we are losing the pace.

**Q55 Keith Hill:** Paragraph 3.14 tells us that these metrics, which are obviously very important, still may develop half way through the concept phase. Why?

**Dr Hollinshead:** Basically, because obviously we are trying to get a feel for the cost drivers that are important to the project and for what information the Programme Board feels it needs as a group to manage across all defence lines of development. One of the things the Programme Board has achieved, other than getting all the stakeholders together, is the opportunity to make a good start on performance management arrangements. One of the things we presented at the last programme management board was a scorecard in which we look at performance. That means how mature are the requirements? Are we meeting CASD? Are we meeting the key requirements? Are we on schedule for the concept phase plan? Are we on cost both against the in year spend and against milestones, and

---

 Ministry of Defence
 

---

also against the White Paper figures, because we monitor how our designs relate to the White Paper figures? We also monitor risks and dependencies.

**Q56 Keith Hill:** Paragraph 3.14 says that they are still not giving you the information you need. Do you accept that?

**Dr Hollinshead:** The Programme Board gave us some comments back, which is what we wanted, to say, “This is a comprehensive list but we think this should be a higher priority, or that is something we do not need to see.” The NAO report says that by next September we must have a working system. I have a prototype in place that the Board is reviewing and I am confident that well before next September they will have what they want. What they have at the moment is all the information and we are saying, “Which bits of this do you really want to see and which bits are you happy to manage lower down?” That is the process we are going through.

**Q57 Keith Hill:** In paragraph 3.15, the NAO tells us that problems in receiving timely information from other teams led to the establishment of the Programme Support Office in April of this year. May I ask what difference this has made?

**Dr Hollinshead:** It has made quite a lot of difference because all the IPT leaders—to avoid jargon, those who run the projects that make up the programme—are now members of the Programme Office Board and every six weeks I sit down and review their progress, their finances etc., so that we get one collective view of how the deterrent programme is going, rather than 12 or 13 independent reports to then sift through. We are now on our third review of how everyone is doing and I think again it is starting to work quite well, because I can present back to the Programme Board a single view of how we all agree the programme is doing.

*(The Committee suspended from 4.14pm to 4.21pm for a division in the House)*

**Q58 Mr Burstow:** I wanted to look at the section dealing with decision making in the concept phase. I particularly wanted to draw attention to paragraph 2.9, where it says that there is an obvious judgment to be made about when to fix the design parameters for the submarine and how much more options analysis work to undertake first. Could you say what assessment has been made of when the last practical and possible time for making a decision actually is?

**Sir Bill Jeffrey:** The tension that that paragraph describes is undoubtedly there because you do not want to make the decision too early and fix things undesirably. Equally, you do not want to leave it too late.

**Rear Admiral Mathews:** We have been quite clear throughout this process that it takes 17 years to design and build a nuclear powered deterrent submarine. Working backwards, that is two years sea trials, seven years in construction, seven years design and two years in concept. We are quite clear in our mind that the concept phase needs to be two years if we are going to stick to our programme. You will recognise that I have just given you two, seven,

seven, two, which is 18 years, not the 17 years that we have. We are already planning therefore for a slight overlap between design and construction.

**Q59 Mr Burstow:** How much overlap?

**Rear Admiral Mathews:** One year.

**Q60 Mr Burstow:** How typical would that be for the projects that colleagues have mentioned so far as exemplars of non-best practice? How many of those have had that sort of overlap?

**Rear Admiral Mathews:** Most of them have had a far bigger overlap than that.

**Q61 Mr Burstow:** What was the planned overlap in the past?

**Rear Admiral Mathews:** They are different projects and therefore I could not give you an exact answer on each of those.

**Q62 Mr Burstow:** Could I give notice and ask for a note on that so that we can get some sense of how much planning there had been of overlap and how much it overran?<sup>3</sup>

**Mr Lester:** Yes.

**Rear Admiral Mathews:** We are planning a concept phase of two years. The White Paper did an awful lot of clarifying the concept phase. It narrowed down the options base before we started. We knew it was a submarine. We knew it was nuclear powered. We knew it had to fit existing infrastructure. The options base is considerably narrower than where we typically start the concept phase from. That is why we are quite confident about delivering an outline design: a set of options for the Investment Approvals Board to take at Initial Gate in the autumn of next year.

**Q63 Mr Burstow:** One of the decisions that is potentially not required until 2014 is the decision about how many boats to buy, whether it is three or four submarines. That does not come until the Main Gate investment decision. Why is it that that decision can be left until that point?

**Sir Bill Jeffrey:** Our intention is to take that decision when we feel we have enough information on which to take it. It goes back to whether the reliability of the new generation can be confidently predicted to be sufficient to provide continuous at sea deterrence with three rather than four. There is an element of circularity in this because there are choices to be made about how much reliability to design into these boats. We may conceivably take that decision a little earlier than Main Gate. It depends on the moment at which we feel we know enough to make the judgment.

**Dr Hollinshead:** It is part of the concept phase that both my team and the Admiral’s combined are doing a three versus four boat study in detail. We already have half of that done. We are quite well into the groove in terms of understanding the issues there.

<sup>3</sup> Ev 16

---

**Ministry of Defence**


---

**Q64 Mr Burstow:** Can I move to the governance arrangements, risk area three? Can I draw attention to paragraph 3.12 where it talks about the Health and Safety Executive's Nuclear Installations Inspectorate? It goes on to say that whilst they do not have a legal responsibility for licensing in this area they have indicated to the NAO that the Department could make better use of its cross sector expertise. Why has that not happened so far? Are there plans to have such discussions to make better use of their expertise?

**Sir Bill Jeffrey:** As a general issue, one of the lessons we have learned from the Astute experience is the importance of docking at a high level with stakeholders such as the HSE, so we will certainly do that. Why were we not doing it earlier?

**Rear Admiral Mathews:** I do not think that is quite the message in my view that the HSE and particularly the Nuclear Installation Inspectorate were getting over. We have civil elements of this programme—i.e., dockyards and Aldermaston—which are licensed by the Nuclear Installations Act. We also have military elements of this programme where we have our own Defence Nuclear Safety Regulator who authorises—a slightly different term but a very similar process in terms of underwriting the way we conduct nuclear safety in our business. The HSE are engaged in our programme. From their perspective, the message is that we went through a very difficult journey with them on the D154 project, that big project in Devonport, to upgrade the nuclear facilities there. It was a learning experience for both parties. There was a very clear message from the NAO Report back in 2002 into D154 that we needed to work together in a better way. We are continuing on that journey. I think relationships are much, much better than they were. We have frequent meetings with them. They are brought into what we are doing. They know where the programme is going and they know where the engagement will be in this programme as we go through time.

**Q65 Mr Burstow:** In response to the phrase in here that the Department could make better use of its cross-sector expertise, you are saying it is already doing so?

**Rear Admiral Mathews:** I believe it is, yes.

**Q66 Mr Burstow:** Therefore, when this Report was signed off, that point somewhere along the line was not flagged up in signing it off with the NAO presumably?

**Sir Bill Jeffrey:** The NAO were reporting what the HSE had said. What we are saying is that we now feel the relationship is stronger.

**Q67 Mr Burstow:** May I move on to 3.13? "The Department recognises that there are critical interdependencies at a high level between programme strands and between this and other programmes . . . ". It goes on to say, "Although these interdependencies have been considered, they have not all been mapped out in detail . . . ". Is there a timetable for that mapping? When will all of the interdependencies have been mapped?

**Sir Bill Jeffrey:** The short answer is that this is an essential part of what the concept phase is doing.

**Dr Hollinshead:** We have now had for the last couple of months on a large sheet of A zero paper all of the lines of development—the submarine, the missiles, the people, the infrastructure—mapped out. We now understand the milestones and how they interact. We are now looking further at interaction with other programmes. It is part of what we set up the programme support office to do. On our score card we now have one of the metrics as dependencies and are there any risks in there that need flagging up and looking at. I think we are making quite good progress and again I would have thought, within the next few months—the NAO said by next September, but I would have thought more quickly than that—we will have something where we can understand the dependencies and, if there are any risks between them, flag them up to the Programme Board for decision.

**Q68 Mr Burstow:** Can I pick up on something in risk area four? It says in paragraph 4.5, "The Department accepts that the White Paper cost estimates are not sufficiently robust to provide an accurate baseline against which progress can be measured and budgetary control exercised . . . ". In terms of the work that has been done to date, when will such baseline data be available to allow that budgetary control?

**Sir Bill Jeffrey:** As I said earlier, we included in the White Paper the best ballpark estimate we could offer of the overall cost. This phase, which we are describing as the concept phase, is refining that and developing costs in greater detail. When we come to Initial Gate in the autumn of next year, we will have better costings and the intention is to make some sort of—

**Q69 Mr Burstow:** At the first gate, you would have an accurate baseline against which progress can be measured and budgetary control exercised and sufficiently detailed cost models which can be used to manage cash flow?

**Sir Bill Jeffrey:** That is the intention.

**Dr Hollinshead:** The cost models should have a design in them by which we can cost in some detail. We will also understand the infrastructure and manning implications because we will know for example for which designs how many people there are on them or how much infrastructure they require. At that stage we will have a much better feel for how the different designs look and cost.

**Q70 Mr Burstow:** Can I draw your attention to box eight on page 26? It refers to the tax treatment of the programme and says that the tax treatment of the programme as a whole is yet to be determined. Has it, since this Report has been written, been determined and, if so, what is the result?

**Sir Bill Jeffrey:** The situation has not changed but the situation is a little simpler than the Report may have led you to believe. We will follow the Astute model which, for all practical purposes, is zero rated

---

 Ministry of Defence
 

---

for VAT. There are some surrounding issues about elements which have to be worked out in more detail.

**Q71 Mr Burstow:** Our nuclear deterrent is not VAT rated at all?

**Mr Lester:** It depends which elements you are talking about. Elements of it are and elements of it are not.

**Q72 Mr Davidson:** In the paper you mentioned that the Initial Gate decision will be taken by September 2009. Parliament is not sitting then. Will we be given the opportunity to approve it before the summer, which means you have to take a decision earlier, or will it wait until October or November, in which case there will be a delay?

**Sir Bill Jeffrey:** Initial Gate is an internal point at which we essentially decide that the concept phase has been completed such that—

**Q73 Mr Davidson:** I understand what it is.

**Sir Bill Jeffrey:** We would be reporting to Parliament as soon as Parliament returned on the key elements.

**Q74 Mr Davidson:** Dr Hollinshead is nodding saying you would be reporting what you had done but obviously it would be for our approval.

**Sir Bill Jeffrey:** I think these would normally be decisions taken by ministers.

**Q75 Mr Davidson:** That is to be pursued somewhere else. Can I clarify whether or not any decisions have been taken about whether the new reactor will be two or three?

**Rear Admiral Mathews:** No decision has been taken. This is part of exactly what we go through, the option phase at the moment, and we are looking at three options effectively.

**Q76 Mr Davidson:** Have you any idea on when a decision on which reactor will be taken?

**Rear Admiral Mathews:** By Initial Gate.

**Q77 Mr Davidson:** Can I ask Mr Lester or, to give you your official title, the fall guy—since presumably, when pass the parcel has finished, you will be “it”—I understand that you are only part time on this. Can we be reassured that your other duties are not going to lead you to neglect your responsibilities in this area?

**Mr Lester:** This is arguably the most important responsibility I have. How much time on it I spend depends on the issues which have arisen at the time. I expect it will become a bigger part of my job in the run up to the Initial Gate decision. I have more full time support than probably any other SRO in the Department. I have Dr Hollinshead and the division working for him and also the programme support office in Abbey Wood. I have quite a big infrastructure underpinning me.

**Sir Bill Jeffrey:** There are other very senior full timers on this case, including the two star.

**Q78 Mr Davidson:** You can understand the anxiety when we hear that various people are being rotated out of this and the person who is “it” is only part time. Can you assure us that that will not cause any possible difficulties?

**Sir Bill Jeffrey:** As I said earlier, the location of the Senior Responsible Owner in Guy Lester’s post is the right place for it to be at the moment for the reasons I gave to do with the wide view of the Department. The programme director is a full time post and he is responsible for nothing but driving this programme forward. I think it is sufficient but we need to keep it under review because, as you move from policy to concept to delivery, the nature of the SRO ought to evolve. I think that is one of the points I take from the NAO Report.

**Q79 Mr Davidson:** Can I ask a number of questions about our relationship with the United States? I am a bit anxious that, on a number of these areas, we do seem to be pretty beholden to the United States. If there are delays in the United States programme, is that irrevocably going to damage your other timetable?

**Sir Bill Jeffrey:** First of all, I would not use the word “beholden” myself. I think it is a strong, mutually supportive relationship. One of the side effects of the fact that, because the Ohio class submarine has a longer projected life than the Vanguard has, is that in some respects we are moving earlier than they are. Therefore, it is genuinely mutually dependent.

**Q80 Mr Davidson:** It is genuinely mutually dependent but it is more mutually dependent for us than it is for them in the sense that they can more easily allow it to slip to the right in time terms than we can. Are there any signs? Under budget pressures, who knows whether or not the Americans might feel able to relax the timetable a little in order to save money in the short term? What guarantees are there that they will not do that?

**Sir Bill Jeffrey:** My colleagues will correct me if I am wrong, but I do not think there is any significant respect in which what we are planning here is dependent on US timetables. As was exposed by the earlier questioning, if anything an issue arises from the fact that the Ohio class will come to the end of its life partway through and, indeed, the extended D5 missile will come to the end of its life partway through the expected lifetime of our successor deterrent. I do not see immediately the sort of dependency you are implying in which any delay on the US side would impact adversely on us.

**Q81 Mr Davidson:** Can I just clarify. We are in more of a hurry to get this new system than they are, are we not?

**Sir Bill Jeffrey:** We need to replace the existing Vanguard class of submarines earlier than they need to replace their equivalent.

**Q82 Mr Davidson:** So if they take their foot off the gas in order to save money, which is entirely understandable give the financial pressures they

---

 Ministry of Defence
 

---

might be under, then that is going to impact much more upon us than on them. What guarantees do we have that they will not do that?

**Sir Bill Jeffrey:** I may be misreading this, and my colleagues will tell me if I am, but I do not think what we are doing is dependent on the pace of their replacement programme, it is dependent on the quality of the co-operation, in particular over the important issue of the missile itself and the missile compartment, and that co-operation is of a very high quality.

**Rear Admiral Mathews:** The common missile compartment is the nub of this question because that is the piece of equipment we need from the US. We have not designed it in the past, it has traditionally been a served-in design from the US because they have been ahead of us in developing the Polaris system and the Trident system. We are in a different place here. The exchange of letters between the Prime Minister and the President, and subsequently between the Secretary of State for Defence and Sec Defense in the US, have underpinned the continuing relationship under the Polaris Sales Agreement. That is an international treaty that gives us significant protection in terms of the US commitment to us. The Americans are committed to delivering the common missile compartment design to us. They are on the programme with us, they are working with us. You are right, there is some risk to us if they do not deliver, but in terms of going down a separate route of UK design to design our own missile compartment, which would still take the Trident D5 missile which the US would then insist on underwriting in terms of certification through a complex testing programme, this is the best value for money deal that we will get.

**Q83 Mr Davidson:** I understand that there is no alternative, I understand that aspect of it, I just want to be clear about the extent to which our timetables gel. I want some clarification on the question of technology transfer. Are there any difficulties that are conceivable with the United States in terms of technology transfer to us for any subsequent upgrading at all? We had some of this in relation to Joint Strike Fighter when there were discussions, but is there any parallel here at all?

**Rear Admiral Mathews:** No, this is completely different because the Polaris Sales Agreement is an international treaty, it is a government-to-government agreement which cuts through all the Foreign Military Sales type issues and ITAR issues such as we have had with the Joint Strike Fighter. This has stood the test of time for 50 years. We are well-rehearsed in technology transfer through the Polaris Sales Agreement. It happens constantly and we are currently in an obsolescence management programme for the strategic weapons system within the Trident system and it is not an issue.

**Q84 Mr Davidson:** Can I turn to the major point about the cost of supporting the submarine industry. As part of the Defence Review we agreed that we were going to maintain all sorts of things for submarines. As I understand the report, the cost of

maintaining a British submarine capacity is not being borne by the nuclear programme, in which case by whom is it being borne, or by what programme? Is this a way, as it were, of having some of the costs off the nuclear programme on to conventional submarine provision?

**Sir Bill Jeffrey:** The submarine programme is either to be the deterrent or nuclear powered submarines, namely the Astute, so the cost of the indigenous industry can be attributed to one or the other of these. What we are very keen to do both in relation to the construction part of the submarine industry and the support part is to use such leverage as we have through this programme, and for the reasons that we discussed earlier there are some limits on that leverage, to encourage industry to drive costs out, to be open with us about the costs and to make the whole thing affordable.

**Q85 Mr Davidson:** I just want to be clear about the ongoing costs of maintaining a submarine building and reactor capacity. Is part of the cost of maintaining that capacity being borne by this programme or is it only going to be borne by other programmes?

**Rear Admiral Mathews:** The way to look at this is that we have a UK industry which comes with an overhead and what we have done is by designing the Astute programme we have optimised the throughput through the Barrow BAE Systems' yard to get to an optimum build drumbeat, as we call it, basically to sustain industry and to flex skills. Though our aim is clearly to deliver a seven Astute programme, because that is the capability that we need to meet our defence outputs, underneath that sits a programme and an approach to programme management that has optimised the rate we build submarines against the workforce we have and the facilities we have to make an efficient, lean organisation delivering the output we require. The longer term commitments we can make in terms of forward programme, the better planning we can make in terms of managing business across build and support. This is a long-term programme that makes long-term commitments that enables us to make long-term planning decisions about how we manage UK industry and the overhead that goes with it.

**Q86 Mr Mitchell:** Can I pursue the point Ian Davidson has mentioned. The Defence Industrial Strategy in 2005 established the principle that the United Kingdom would retain all those capabilities unique to submarines. Why? Submarines are perhaps a useful weapon in a Cold War situation when you are opposing another submarine power with nuclear submarines, but when it comes to the kind of work of the Navy or the Defence Department, whether against pirates, Sierra Leone, touring the Gulf or whatever, nuclear submarines are no use at all. It is just a residue of Cold War thinking that we have got to have this.

**Sir Bill Jeffrey:** The thinking behind that part of the Defence Industrial Strategy was that the technologies involved in constructing nuclear

---

 Ministry of Defence
 

---

submarines for our use, and in particular the capability required to support them once they have been got into service, were in that category of defence capabilities that ought to be kept on. What I would add to that is not at any price. If you look at the White Paper, paragraph 6.3 signals our intention to build the new SSBNs in the UK but this is dependent on proposals from industry that provide the right capability at the right time and offer value for money. We are not saying it will be done in the UK at any price, but I think it will very probably be done in the UK for the kinds of reasons that are set out in the Defence Industrial Strategy.

**Q87 Mr Mitchell:** Are we a big enough, serious enough and powerful enough nation with a strong enough engineering and construction tradition to be able to afford to maintain a submarine capacity? What other countries have it besides the US and Russia?

*Sir Bill Jeffrey:* The French do.

*Rear Admiral Mathews:* Nuclear powered submarines or nuclear deterrents?

**Q88 Mr Mitchell:** The French will want to build a euro nuclear sub, I have no doubt!

*Rear Admiral Mathews:* France, US and UK have deterrent submarines. Others are aspirant to it and a number of other nations operate nuclear powered but not nuclear armed submarines.

**Q89 Mr Mitchell:** It is very specialised. 5.2 tells us: “The industry is made up of a number of monopoly suppliers, including BAE Systems and Rolls-Royce . . .” That means two things. One, they have got you over a barrel when it comes to negotiating with them because they are the only people you can buy from. How do you control their costs? How do you manage the contract?

*Sir Bill Jeffrey:* That has been the challenge of the Astute programme. As I said earlier, we have learned from that programme. To my mind, the essential starting point is to acknowledge that we are dealing with single suppliers in this case, as we sometimes are in the defence field and as other nations are in their own particular contexts as well, and how best to get value for money within that sort of context.

**Q90 Mr Mitchell:** Do these firms do anything else? Are they so specialised they only exist if you are building nuclear submarines?

*Sir Bill Jeffrey:* The Barrow shipyard in recent years has very much specialised in the construction of nuclear submarines, yes. It has not only done that.

*Rear Admiral Mathews:* It’s surface ships as well.

**Q91 Mr Mitchell:** It must be a drain on lots of other aspects of industry, whether it is making cars, washing machines or better fridges, that so many skills are tied up in this particularly useless sector.

*Sir Bill Jeffrey:* Without rising to the word “useless”, these are very specialist skills. Undoubtedly, one of the issues we have is to ensure that the nuclear submarine industry continues to—

**Q92 Mr Mitchell:** If you are a mother or a teacher advising a son, I notice posters around Yorkshire, “Go into coal mining, it’s a job for life”, but you would not say, “Go into nuclear submarine design, lad, it’s a job for life”, would you? It is a very fraught thing, it depends on contracts and in the ultimate it is a very narrow concentration of skills of no use anywhere else.

*Sir Bill Jeffrey:* Just at the moment it is a job for quite a while is one answer to that question. Secondly, as the civil nuclear industry is built up, as appears likely, the challenge for us is to ensure that we, as the Report brings out, have a flow of suitably skilled people because people with these skills will be in very high demand.

**Q93 Mr Mitchell:** Is the cross-subsidisation there similarly with the nuclear industry?

*Sir Bill Jeffrey:* Certainly there is an extent to which the same skills are relevant to both and we are in competition for these skills. We are very conscious of it and have a project going on at the moment to think about how we can become more successful in recruiting people with this skill set.

**Q94 Mr Mitchell:** I want to ask the Rear Admiral why the Navy wants these big beasts. You could have lots of frigates, you could be shooting and arresting pirates in the Indian Ocean.

*Rear Admiral Mathews:* We are.

**Q95 Mr Mitchell:** You could be deployed in the Gulf massively, you could have lots more frigates, destroyers, anything you wanted. Why do you want all the money put into these big beasts, 5–6% just to keep them going?

*Rear Admiral Mathews:* There are two separate issues here. There is the strategic submarine, the ballistic deterrent submarines, which is government policy which the White Paper—

**Mr Mitchell:** That is an excuse that it is government policy. Why does the Navy want them?

**Q96 Mr Curry:** It is your Government.

*Rear Admiral Mathews:* Then there is the—

**Q97 Chairman:** The poor Admiral cannot start disagreeing with the Government, it would not do his career any good!

*Rear Admiral Mathews:* There is a fundamental question about what Hunter Killer submarines do. They have a wider range of capabilities, including intelligence gathering, which is extremely useful in these days of piracy at the moment, for example, special forces. I could go on and bore you, but they are far more capable than you probably think.

*Sir Bill Jeffrey:* The policy was set out in the White Paper which was the subject of a parliamentary vote.

**Q98 Mr Mitchell:** Given the absorption of skills that could be usefully employed elsewhere that are needed to keep this industry going, why do we not just pack it in and buy from the Americans?

*Sir Bill Jeffrey:* In practice I do not think that would be feasible.

---

 Ministry of Defence
 

---

**Q99 Mr Mitchell:** Why?

**Sir Bill Jeffrey:** That is a judgment that has been made because of the supply base in the US. History also suggests that although it may seem very expensive to acquire the Astutes, per boat they are probably less expensive than those that—

**Q100 Mr Mitchell:** We are dependent on them for the missiles. We have problems now about the size of the missile part of the submarine which are dependent on what they design for their purposes, not on what we need.

**Sir Bill Jeffrey:** As we said earlier, there are some very constructive discussions going on about the common missile compartment and the means of making sure that we do not come adrift of their thinking.

**Rear Admiral Mathews:** There are significant advantages to being at the start of a programme with the Americans rather than buying into it at a later stage. One is that we can influence decisions. Secondly, there are much greater opportunities for UK industry to compete on a level playing field in the market of the future missile compartment. In the past we have bought an American design.

**Sir Bill Jeffrey:** If I may say so, Mr Mitchell, although we need to be driven by defence capability rather than purely industrial considerations, there are many who would think that a thriving expert nuclear submarine industry in the UK is a good thing.

**Q101 Mr Mitchell:** The Americans are perfectly capable of ditching us as they did with Polaris, did they not, and yet we are depending on them for the size and design of the missile compartment of this ship. At what stage in the design can you change that and enlarge it, if necessary?

**Sir Bill Jeffrey:** The purpose of the discussions that are going on now is to agree on the approach to a common missile compartment that we would adopt in our successor submarines and that in due course they would adopt in theirs with an eye to getting the dimensions right in both cases.

**Q102 Mr Mitchell:** CND have submitted some ideas to us and they say that the MoD is not serious when it suggests that it could keep the Trident D5 missiles in service throughout the life of the new submarine, I am told 2055. Are you saying that?

**Sir Bill Jeffrey:** I do not think we are saying that. One of the things that underlie this whole approach is our realisation that even assuming, as is a fair assumption, that the D5 missile was extended, the extension will take us only partway into the projected lifetime of our successor deterrent and that is the reason we are thinking now with the Americans about what happens after that.

**Q103 Chairman:** Presumably the answer to Mr Mitchell when he said why do we not buy off the Americans is if we bought everything off the Americans it would not be independent any more, is that the answer?

**Sir Bill Jeffrey:** As the earlier question exposed, the independence of our deterrent lies in our ability to operate it independently and there is undoubtedly an

extent to which if you view the whole thing, the submarine and the launch system, missile warhead, there are significant respects in which we are dependent materially on the American contribution, but that is not to say it is not an independent nuclear deterrent.

**Q104 Chairman:** But not on the targeting of the warhead?

**Rear Admiral Mathews:** No, or the communications.

**Chairman:** Or the communications. Thank you.

**Q105 Mr Williams:** In my 18 years on this Committee the worst case I ever came across was the construction of the Trident base and the installation of the lift. Can I ask the NAO, I do not know whether anyone goes back as far as I do there on these reports, when you were preparing this Report did any of you have a feeling, "This is somewhere I have been before"?

**Mr Banfield:** No, I did not. I think some of the work that we have done in the past, particularly looking, as the Rear Admiral referred to earlier, at the D154 in Devonport, you could see then there were similar challenges around the importance of timescales. We never felt this was just a repeat of what happened before.

**Q106 Mr Williams:** You do not see potential similarities? Remember, the cardinal sin as far as this Committee is concerned, because it is so often easily avoidable, is changing specifications partway through a contract when you are firmly over this bow that keeps arising in our comments because you have no power to negotiate competitive tenders. That is a fact, is it not? That was a feature of the Trident base in Scotland and the lift. You do not see similar potential here?

**Mr Banfield:** There are similar challenges to other aspects of defence procurement on a lot of these things, it is the scale of some of the challenges.

**Q107 Mr Williams:** I am not talking about that sort of similarity, I am talking about similarities in the potential for things going disastrously wrong. In the case of the building of the base there were not just changes of specification in their tens or hundreds, there were thousands of changes of specification. I said on the day there were changes of changes of changes. It was Christmas Day every day for the contractors. This looks to be an absolute blueprint for going down the same route. How can we be following on from the Americans when we have placed the contract and started construction before we finish the design? How can we be sure that we are not going to be in exactly the same situation we were in with the base?

**Sir Bill Jeffrey:** Can I make two comments on that. The first is that before this hearing I read the NAO's report and your Committee's report in 2002 on the Devonport facility and we have learned lessons from that. Our whole approach now is more of partnering, given the single source of supply point that was made earlier, and more of a realistic understanding of how much you can actually transfer risk to the supplier, a more hands-on approach and better management of

---

 Ministry of Defence
 

---

key stakeholders like the regulators. If all of these came out of the Devonport case we are very much on them now.

**Q108 Mr Williams:** If you start construction before you complete the design surely you cannot sit there and say, “We can guarantee we are not going to be having changes on specification along the route”, or perhaps there is some clever way you have found of doing it, in which case I will be very relieved.

**Rear Admiral Mathews:** The important thing to recognise is what we mean by completed design. Having the submarine 100% designed will lead to a much longer build programme and may incentivise people to make changes because of things like obsolescence management. If you are not careful you can take so long designing it things are out of date before you build. It is important to make a balanced decision here about cost to the programme, risk and managing the design. It is clear that you need to make the decisions about the big components, the big systems and make sure you have got the design integrated when you start construction. Some of the really detailed design about where you put some of the small bore pipe work you do not necessarily have to get done. If the aspiration is for us to sit here and say we want to have a 100% design maturity before we start construction, that is the Holy Grail, it may not be possible for us to achieve that, and nor should we try because it will drive you to additional costs in build. It is about making a balanced design and being clear about where the design has gone, you have integrated it, you understand it and you are clear about those areas that you have not finished.

**Q109 Mr Williams:** How important is the size of the missile chamber?

**Rear Admiral Mathews:** It is the payload for the submarine, it sets it out, which is why in our work for the concept phase we are very clear about setting out some clear design decisions about submarine diameter, the size of the missile tubes in terms of their diameter and length, so that we are absolutely clear when we proceed to the next phase of the detailed design we have got those things pinned at the start.

**Q110 Mr Williams:** We are told in the Report that the size of the missile compartment depends on the US designing the missile and they have not designed it yet.

**Rear Admiral Mathews:** The whole point is that the US and UK are designing a common missile compartment together which will set the bounds for the future missile.

**Q111 Mr Williams:** That will all be done before—

**Rear Admiral Mathews:** Those decisions and the work we are taking forward now are to reach decisions by the time we get to Initial Gate.

**Q112 Mr Williams:** What sort of timescale would decisions of this sort be needed in?

**Rear Admiral Mathews:** By September next year.

**Q113 Mr Williams:** You are going to be able to make all of these certain commitments?

**Rear Admiral Mathews:** We are intending to make decisions about the missile tube and the diameter of the missile compartment before September next year.

**Q114 Mr Williams:** If it turned out to be significantly larger, what would be the implications of that for the design of the submarine?

**Rear Admiral Mathews:** We are quite clear that it cannot be significantly larger because this submarine has to fit UK infrastructure. The US have exactly the same problem. If you make a submarine significantly larger you end up with a major infrastructure programme to build bigger dry docks, bigger missile handling facilities.

**Q115 Mr Williams:** Bigger lifts.

**Rear Admiral Mathews:** Just like the issue about setting the size of the missile before you design it, infrastructure limits you on the size of the submarine you can build.

**Q116 Mr Williams:** So you can sit there and guarantee this Committee, and you are going to be 76 by that time so I do not think you need to worry about your career prospects at that stage,—

**Sir Bill Jeffrey:** I am tempted, Mr Williams, to return that with interest actually!

**Q117 Mr Williams:** You can sit there and say you are genuinely convinced that we are not going to see any repetition of the disastrous cycle of re-contracting that we saw with the construction?

**Sir Bill Jeffrey:** If I might respond to that. I do not think we would be wise if we sat here and guaranteed anything frankly.

**Q118 Mr Williams:** Well, that is what worries me.

**Sir Bill Jeffrey:** These are difficult.

**Q119 Mr Williams:** A moment ago you were telling me I had got it all wrong because I was casting doubt and now you are turning round and saying, “We are not here to be guaranteeing anything”. I thought that was what you were here to do, otherwise the Government has got a problem, has it not?

**Sir Bill Jeffrey:** What I am saying is, as the Report brings out very clearly, we are responsible for a large, complex, challenging programme extending over many years which has a lot of inherent risks but we will have to manage these risks. We think we have learned from recent experiences and can manage them more successfully now than we have done in the past, but that does not constitute a guarantee. This is a department of state doing its best.

**Q120 Mr Williams:** It sounds a rather equivocal guarantee, if I may say so, from where I am sitting.

**Sir Bill Jeffrey:** Grounded in optimism because I think we are genuinely better placed to deliver this programme on time than might have been the case in the past. As I have said once or twice during this

---

 Ministry of Defence
 

---

hearing, bear in mind that our predecessors did succeed in delivering the Vanguard on time and to cost.

**Q121 Mr Williams:** You are saying, "I think we are", you are not saying, "I am sure we are".

**Sir Bill Jeffrey:** I am confident, but it would be a very unwise—

**Q122 Mr Williams:** You are confident, but. What is the but?

**Sir Bill Jeffrey:** But this is difficult and it has got a lot of risks in it. We need to do our best to manage these risks successfully.

**Mr Williams:** I regret I will not be here when the crucial time comes to look at whether you were right or wrong. Thank you, Chairman.

**Q123 Chairman:** I think, gentlemen, that concludes our inquiry. It has been very interesting and a worthwhile exercise. Clearly this Committee is going to have to come back and look at this after September. I do not know about my colleagues, but I am certainly extremely concerned about this point that we are going to have to design these submarines before the Americans make their final decision on the design of the missile compartment, which appears to be the absolutely crucial point. The Admiral has done his level best to try and reassure us. He is now shaking his head, and, in all fairness, I think I should give him a chance to reply to that point. It is something that is worrying us because there is absolutely no room for manoeuvre here, these things have to be delivered on time. What worries me is we are such a minnow compared to the Americans, they are taking such vast decisions compared to us that I would have thought our bargaining position with them if there is any problem with the design of the missile compartment is quite weak. It is only fair the Admiral has a last say.

**Rear Admiral Mathews:** Just to give you a feel for the programme, Chairman. Our aim is that we are going to design these missile compartments with the Americans. We have not decided where we are going to build them, it might be the UK, the US, it might be both.

**Q124 Chairman:** That is a fairly crucial point for a start.

**Rear Admiral Mathews:** This an ongoing piece of work, as you would expect. Just to give you a feel for how these missile compartments come out: numbers 1 and 2 will be for the UK, number 3 will be for the US, so that missile compartment will be in construction when the first compartment is delivered to the UK.

**Q125 Chairman:** Will be in construction?

**Rear Admiral Mathews:** Will be in construction.

**Q126 Chairman:** We do not even know, but you think they will be built in America now. We have not heard this before.

**Rear Admiral Mathews:** What I said is we have not made a decision about where we are going to build them. When I say that, there are a number of options for us about how we do this. If we are building between 3 and 4 for UK, probably between 12 and 16 for the US, how do you productionise this. If you were to count the number of missile tubes, there are over 300 missile tubes, how do you productionise that, how do you drive out cost and make sure you design the productionisation at the start. Those are all the questions that we have got to go through having made the decisions.

**Sir Bill Jeffrey:** The reason the Rear Admiral reacts as he does is the whole point of the discussions we are having with the Americans now about the common missile compartment is in essence to advance that crucial decision so that it is taken to influence our build as well as theirs, allowing for the fact that they will be replacing later than we are.

**Q127 Mr Davidson:** In relation to this question of the missile tubing and, indeed, other parts possibly being built here, possibly there, the partnership that is going to build the aircraft carrier, and the partnership that is building the Type 45, involves bits being constructed in different locations. Is there any suggestion that any of the American bits will be built in Britain and shipped there, so in terms of driving down cost, as has been done on the aircraft carrier, the longer run and so on and so forth, will any British facilities have contracts for all the UK boats and the American boats as well?

**Rear Admiral Mathews:** That was absolutely the point I was trying to make. There is that potential in this deal, it is very different. There are certain UK companies which have world leading capabilities to do this.

**Q128 Mr Davidson:** The argument then would be that the American deterrent was not truly independent in as much as it was dependent upon bits being built in Britain.

**Rear Admiral Mathews:** If you took, for example, major forgings, which Sheffield Forgemasters make in the UK and potentially make for the US, then I think buying a large forging does not mean that your system becomes dependent on another country, that is done for economic and technical reasons.

**Chairman:** That concludes our hearing. May I say that although I was a bit rude about the Senior Responsible Owner, I always try to congratulate a witness where I can when he performs well in this Committee, and Mr Lester has been very clear in his submissions to us and I am very grateful for his fluent testimony, and indeed to the Admiral. Thank you very much indeed.

---

---

**Supplementary memorandum from the Ministry of Defence**

Question 62 (Mr Burstow): *An amount of overlap between project design and construction phases*

In answer to question 62, Guy Lester undertook to set out for the Committee the amount of overlap between project design and construction phases for the Astute, Type 45 and Nimrod projects. Before providing specific project information, it may be useful to explain why projects include overlap in their planning.

For certain types of projects it is not necessary to complete all aspects of the design work prior to the start of construction. This is particularly true for maritime projects, where programmes comprise a number of elements, and the full design for some of these elements may be reserved for a later date, providing the interface has been specified. For example, it is possible to start construction of a submarine hull before the design of the command and control system is finalised. As well as reducing the time taken for the delivery of the capability, this approach allows emergent technology to be utilised and reduces the chances of equipment becoming obsolescent before it enters service. In contrast, for other types of equipment such as aircraft, where there is a greater degree of systems integration, there are fewer opportunities for design and construction work to overlap as a larger proportion of the design would normally need to be completed prior to the start of construction.

It is part of the normal process of project management to identify dependencies between project elements, so that an efficient programme is developed that takes advantage of opportunities for activities to occur in parallel and for technology insertion during the manufacture phase.

Details of the overlap for individual projects are below.

**TYPE 45**

The Type 45 project is not necessarily representative of all ship projects as much of the design work was completed under the earlier multinational Project HORIZON, with the Type 45 project inheriting a relatively mature design. The overlap for the project is as follows:

Planned date for completion of main design phase: April 2003  
Actual date for completion of main design phase: January 2004  
Planned and Actual start of construction: March 2003  
Planned Overlap: 1 month  
Actual Overlap: 10 months

**NIMROD MRA4**

It is not possible to provide a simple statement of the overlap between different phases. The original contract for Nimrod MRA4 in 1996 introduced some concurrency between the design and construction phases. This approach was unsuccessful, so in 2003 the contract was renegotiated to largely remove concurrency. In 2006 the design was judged to have reached sufficient maturity for full production to be re-commenced. Although design work was continuing and therefore some concurrency remained, this was assessed as being a low risk due to the maturity of the design at that point.

**ASTUTE**

The planned overlap between Design and Manufacture was three years. In practice, the actual overlap was as follows:

Completion of detailed design phase: June 2003  
Start of construction: 2000  
Overlap: 3.5 years

5 December 2008

---