House of Commons
Defence Committee

Helicopter capability

Eleventh Report of Session 2008–09

Report, together with formal minutes, oral and written evidence

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The Defence Committee

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Those who serve the helicopter fleets of all the Services do a superb job, often under difficult and dangerous circumstances. We have been unfailingly impressed by all UK helicopter personnel whom we have met, for their professionalism, dedication and bravery. Helicopters provide many vital capabilities to the modern Armed Forces, from the movement of troops and equipment around the battlefield to the detection and confrontation of submarines at sea. We were concerned both by the proposed reduction in the size of the fleet, and by the emergence of a ‘capability deficit’ ahead of the introduction of newer helicopters.

The Ministry of Defence currently plans to extend and sustain the lives of several ageing helicopter types in an attempt to minimise this capability deficit. Given the age of both Sea King and Puma and the poor survivability of the Puma, extending their lives at considerable cost is not the best option, either operationally or in terms of the use of public money. We do not believe that these LEPs will provide adequate capability or value for the taxpayer. Only a procurement of new helicopters can meet the original objective of reducing the number of types of helicopter in service within the UK Armed Forces.

In our Report, we describe how the concept of ‘helicopter capability’ is built upon the four pillars of manning, equipment, training and support. We were told that, of these, it was the manning pillar that was under the most strain. The opportunity to train for some capabilities, in particular amphibious warfare, has suffered as a result of operational demands. The support structures underpinning helicopters seem actually to be something of a success story, with closer working between the MoD and industry paying dividends in terms of available flying hours—one of the key metrics by which the MoD judges performance in-theatre.

Nevertheless, helicopter capability is being seriously undermined by the shortage of helicopters, particularly medium-lift support helicopters, capable of being deployed in support of operations overseas. We believe that the size of the fleet is an issue, and are convinced that the lack of helicopters is having adverse consequences for operations today and, in the longer term, will severely impede the ability of the UK Armed Forces to deploy.
1 Introduction

Our inquiry

1. We decided to inquire into helicopters in October 2008, in the light of the forecast reductions in the size of the fleet in the medium term. Operational experience has firmly established the value of helicopters to a wide range of operations. Indeed, an operational deployment without helicopters would now be very much the exception. Therefore, we wanted to establish whether the forecast reduction in numbers of helicopters would lead to a reduction in overall capability. We soon found that the meaning of ‘helicopter capability’ varied with its use, and could be used to describe everything from the efficiency with which helicopters are maintained to the operational effect that they produce in-theatre. We set out these different definitions in greater detail below, explain how they relate and how, to some extent, they are interdependent.

2. We announced the terms of reference for our inquiry on 12 March 2009, and we received written evidence from the MoD, industry and learned societies. Before holding oral evidence sessions, we visited the military bases at Middle Wallop and RNAS Yeovilton on 6 May 2009. We spoke to a wide range of personnel from all three Services, from those at Joint Helicopter Command in charge of all battlefield helicopters to the maintenance crew responsible for keeping deployed helicopters in the air. Our visit to Middle Wallop and Yeovilton proved invaluable and we record our thanks to all those involved. Our discussions that day have informed our oral evidence sessions, and indeed, this Report. On 19 May 2009, we took evidence from representatives from industry. On 2 June 2009, we took evidence from the Armed Forces, the Minister for Defence Equipment and Support (Quentin Davies MP) and officials.

Why helicopters?

3. In its written memorandum to us, the Royal Aeronautical Society describes helicopters as “one of the most versatile and ubiquitous of military platforms”. The RAeS notes further that “from its early roles in medical evacuation and tactical transport, the helicopter has evolved into a formidable offensive aircraft, as well has emerging as a powerful element in the provision of tactical heavy lift.” The Minister confirmed in evidence to us that, for the Armed Forces, “Helicopters are absolutely key assets. We could not contend with the challenges in insurgency and counter-insurgency operations like those in Iraq and Afghanistan without helicopters.” Put simply, helicopters are key enablers for the Armed Forces to do their job. Recent operations in Iraq and Afghanistan have required extensive use of helicopters, in particular to avoid the threat from roadside Improvised Explosive Devices (IEDs), a practice developed in response to the threat from IEDs in Northern Ireland. Helicopters are not, however, invulnerable. In Afghanistan, the threat from small-arms fire, rocket-propelled grenades and anti-aircraft guns is very real. The risk is mitigated through a combination of defensive aids suites (DAS) and advanced flying
tactics, but in a case such as a casualty evacuation (CASEVAC) in a hostile environment, the decision taken by a Commander to deploy a helicopter is still finely balanced and requires a great deal of skill and nerve from the pilot and air crew.

4. As well as being an enabling force, helicopters are widely recognised as a force-multiplier that is, a force element which increases the effectiveness of others on the battlefield. In its memorandum, the RAeS argues that “theatre forces without the tempo, mobility and reach provided by helicopters are likely to have to be larger to achieve the same aims and would operate at a higher level of risk.” Rear Admiral Tony Johnstone-Burt, Commander of the Joint Helicopter Command, told us that helicopters could “deliver tempo to the ground force commander; in other words, they can ratchet it up or down, manoeuvre and put in fresh troops without breaking contact.” Furthermore, the roles played by helicopters are an effective counter to the challenge of so-called ‘hybrid warfare’, a term coined by Frank Hoffman, an American academic. Hybrid warfare is a mix of conventional and unconventional methods of warfare, which may vary from day to day or even hour to hour. In a recent speech at the 2009 Air League Slessor Lecture, Major General Barney White-Spunner, Commanding Officer of 3rd (UK) Division and former commander of 16 Air Assault Brigade, described the role played by helicopters in meeting the challenge posed by the combination of conventional and unconventional tactics. Rear Admiral Johnstone-Burt described how the modern insurgent “can move at will; he can exploit the dense urban environment and terrain; he can use the local infrastructure and transport facilities to hide, plan, attack and escape at will and use it to his own advantage in dislocating our own forces”. His view was that “the battlefield helicopter is the perfect antidote to the hybrid warrior in the sense that the agility, flexibility, versatility and potential lethality of a battlefield helicopter counter the apparent advantages of the hybrid warrior”. This has all been brought to the fore by recent events, and has necessitated a very public explanation of what the Government sees as being the role of helicopters in current operations in Afghanistan.

5. The blurring of the hi-tech and more primitive methods in insurgency operations is mirrored to some extent by the convergence of tactical roles played by the helicopters themselves. Older helicopters have adapted to the hybrid battlespace: Chinook, for example, provides both ‘heavy lift’ of troops and kit and CASEVAC as described above. Newer platforms such as the Apache have been designed with the convergence of tactical roles in mind. Contributing to Intelligence, Surveillance, Target Acquisition and Reconnaissance (ISTAR) has become a key task for all helicopters. There are also good cost and efficiency arguments for multi-role helicopters. The large number of types and variants of helicopter in use within the UK Armed Forces leads to inefficiencies and increased costs. The MoD’s current plans include the consolidation of several ‘legacy’ platforms into the Future Medium Helicopter, an issue which arose several times in the

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4 Ev 49, para 4
5 Q 134
6 Q 131
7 ibid.
8 We are inquiring separately into The contribution of ISTAR to operations, and will hold further oral evidence sessions in the autumn.
9 Q 153
course of our inquiry. We were also made aware of the value of the helicopter for the maritime commander, especially in its potential for extending the reach of frigates and destroyers. Helicopters provide many vital capabilities to the modern Armed Forces and, with the challenge of hybrid warfare, are becoming increasingly relevant to current and contingent operations. Their status as force-multipliers lends further weight to their value. They are a cost-effective means of increasing the operational impact of other force elements and therefore, of operational capability generally. As such, it is essential that the fleet should be ‘fit for purpose’, both in terms of quality and quantity.

Helicopters in the UK Armed Forces

6. Each branch of the Armed Forces operates helicopters, which are classified by the capabilities they provide. The MoD identifies three ‘core’ types: support, find and attack, and search and rescue. Support helicopters, responsible for moving equipment and personnel, are further classified by the ‘Maximum All Up Mass’ into heavy lift, medium lift and light. Find and attack helicopters differ between the maritime and battlefield environments. On land, targets range from buildings to machine gun emplacements. At sea, helicopters are equipped to locate and attack vessels on or under the water. As further evidence of the convergence of roles, military search and rescue is carried out by both find and attack and support helicopters. Operational control of battlefield helicopters is devolved to the Joint Helicopter Command (JHC). JHC was established in 1999 in order to bring a joint approach to the provision of battlefield helicopters from each of the three Services. It is responsible for the operational control of the Royal Navy’s Commando Helicopter Force, the Army Air Corps, and the Royal Air Force’s medium and heavy lift fleets.

7. The Royal Navy maintains a maritime patrol capability through two marks of Lynx (Mk 3 and Mk 8) and one of Merlin. The Sea King Mk 7 is used for Airborne Surveillance and Control, and has recently been deployed to Afghanistan. In addition to this ‘grey’ helicopter fleet, the Royal Navy provides the Royal Marines with an airborne capability through the Commando Helicopter Force (CHF). The CHF uses two marks of Sea King (Mk 4 and Mk 6c) and one of Lynx (Mk 7). The Mk 4 Sea Kings are deployed on an enduring basis in Afghanistan, and the Lynx operate alongside the Lynx flown by the Army Air Corps. Within the UK, the Sea King Mk 5 is used by Search and Rescue.

8. The Army Air Corps provides find and attack capability on the battlefield. Two marks of Lynx (Mk 7 and Mk 9) are used for reconnaissance, direction of fire, light troop transportation and command support. The Apache attack helicopter was deployed to Afghanistan in 2006, since when it has played a critical role in supporting operations through close combat attack. The Gazelle fleet is being run down as it is no longer fit for overseas deployment, but retains some utility for certain training and support tasks in the United Kingdom.

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10 Ev 56, paras 1.4–1.16
11 Ev 55, para 1.2
12 UK based search and rescue is delivered by Mk3/3a and Mk5 Sea King.
The Royal Air Force supplies the backbone of the support helicopter fleet. The medium and heavy lift aircraft used for moving troops and equipment around the battlefield are the Chinook Mk 2/2a, the Merlin Mk 3/3a and Puma. In the UK and Falklands, the Sea King Mk 3 provides a Search and Rescue capability. The demand for increased flying hours from the Chinook fleet has led to improved in-theatre support arrangements being developed. Above and beyond the now-standard Integrated Operational Support (IOS), the MoD and Boeing have collaborated to develop a system known as Through Life Capability Support (TLCS) for Chinook. David Pitchforth of Boeing told us on 19 May that “When we took that [TLCS] on three years ago we contracted for 12,000 flying hours of Chinook. The RAF had never achieved 12,000 hours at the point when we took over the contract. We are now heading towards 16,000 hours with a target of going even higher than that in the future.”

In our second evidence session on 2 June, Commodore Russ Harding, Head of Equipment Capability (Air & Littoral Manoeuvre), added that “and perhaps others sitting here need to look at the other forces because the Chinook model that I hold up needs to be replicated in other places. We need to see how we get that sea change in doing that”.

Following the drawdown in Iraq, Afghanistan is set firmly as the focus of the MoD and Armed Forces’ efforts. One consequence of placing that mission on a ‘campaign footing’ is that what helicopter assets the UK has there are intended to remain for the foreseeable future. Co-ordinated by Joint Helicopter Command, they are tasked by a Commander Joint Aviation Group in order to produce operational effect for the Commander of Regional Command South. Although “the lion’s share of the British helicopter capability” goes towards supporting Task Force Helmand, the capability is held centrally along with those provided by other nations in order to maximise flexibility for operations.

Afghanistan’s hot and dusty conditions prove very challenging for helicopters designed for use in Europe, the Arctic and sea operations. We were told that serviceability rates were good, but that the older helicopters “find it harder work and more of a challenge than the others, specifically the Sea Kings.” It is essential that available flying hours are maximised, and to this end the Sea Kings have been fitted with new rotor blades and a five-rotor tail, which has improved lift. Maintenance issues are central to in-theatre capability. The Minister told us that he was “interested in outputs rather than inputs; I am not interested in counting platforms but buying capabilities.” This question of ‘inputs’ arose the week after our second evidence session of this inquiry, when we took evidence as part of our inquiry into The Comprehensive Approach from Brigadier (retired) Ed Butler, a former commander of British Forces in Afghanistan. He explained that the threat from IEDs in Northern Ireland had forced the movement of personnel into helicopters. In 2006 he had advised that deploying more troops to Afghanistan without a commensurate increase in
the amount of tactical lift would lead to severely reduced mobility.\(^{19}\) Significant improvements have been made to the availability of key assets such as Chinook. However, in the longer term, increased availability will be no substitute for additional capacity. Adequate capability is also a question of numbers of airframes. We will return to this later in our Report.

\(^{19}\) Uncorrected transcript of oral evidence taken before the Committee on 9 June 2009 for it’s inquiry into The Comprehensive Approach, HC (2008–09) 523–I, Q 79
2 Defining capability

The four-legged stool

12. The ‘METS principle’ describes capability as the combination of Manpower, Equipment, Training and Support. Within the JHC, an analogy has been drawn between helicopter capability and a four-legged stool. In evidence to us, Rear Admiral Johnstone-Burt explained that, for the purposes of planning for between 15 and 20 years of sustainable capability on operations, each leg of the stool (people, support, training and aircraft) “must be as strong and as long as each other; otherwise, the stool will fall over.”20 He added that “there are strengths and fragilities in each stool depending on the aircraft type we are talking about, but one leg that is probably the least robust is the people”, by which we took him as meaning manpower levels.21 We found this analysis persuasive.

Manpower

13. The Rear Admiral’s identification of people as ‘probably the least robust’ did not come as a great surprise. Manning is not a challenge exclusive to the helicopter fleets, but we did learn that the frequency with which personnel are being deployed to high-intensity operations is having an effect on retention. Rear Admiral Johnstone-Burt told us that “The manning situation as a whole for all our crew—air crew, ground crew and engineers—is okay and we are managing, but we are at maximum stretch and there are hot spots in certain areas depending on the fleet we are talking about.”22 He identified Apache pilots and engineering technicians as areas in particular need of improvement. Although each of the Services have different harmony guidelines, the JHC has its own, “a rule of five, so it is one on four off”.23 Rear Admiral Johnstone-Burt instituted the ‘rule of five’ “because it was sustainable and robust and I could guarantee that with 20% on operations and 80% doing other things I could ensure that was a robust, enduring capability at this tempo for the next 15 to 20 years.”24 The JHC harmony guidelines reflect both the high level of activity and commitment to training and leave, both of which are essential for the purposes of performance and retention. To illustrate the consistently high level of activity, the Chinook fleet has been on operations almost continuously for 25 years.

14. The intensity and tempo of current operations create great demands in terms of support, and keeping helicopters serviceable and available for operations is a key challenge for the MoD to face. Closer working with industry is, by all accounts, paying dividends, but problems do exist with, for example, the number of spares for certain newer helicopters. The National Audit Office’s report on Support to High Intensity Operations states that over the last two years the MoD has delivered “on average 5% above its target for serviceable helicopters to support operations” but that this has come at the cost of “availability of United Kingdom-based helicopters since 2006 [being] on average 11% below the

20 Q 128
21 ibid.
22 Q 108
23 Q 109
24 Q 114
Department’s target, reflecting the priority the Department gives to equipment deployed on operations”.25 Rear Admiral Johnstone-Burt commented to us that “we talk about ourselves being on what we call a campaign footing. My focus has been exclusively on delivering success in Afghanistan and Iraq.”26 Such prioritisation is entirely appropriate, but it should be noted that the stretch placed on resources is such that delivering increased capability to theatre is not without cost.

15. One such cost is in the time, manpower and aircraft available for training, particularly larger-scale or more demanding training scenarios. The particular areas identified in the course of the evidence we took where current tempo is impacting upon training were littoral (ship to shore) manoeuvre and large-scale amphibious operations. Rear Admiral Johnstone-Burt said that being able “to land and take off from moving decks in rough seas by day or night” was a “core capability because if necessary we need to do that come what may. We are just keeping the flame alive in that sense, but we need to work at it.”27 It is very difficult to practice moving of large numbers of Royal Marines from sea to shore at a time when demands on their time, and of the necessary helicopters, are so great.

16. This leads to the fourth leg of the stool: the helicopters themselves. Much of the debate around the issue of helicopters takes—as we have done—as its starting point the forecast reduction in the size of the fleet. In its written memorandum to us, the MoD attributes the reduction to “changes in the way the Department delivers battlefield capabilities”.28 The MoD gives three examples. The Gazelle, a light helicopter, has an out of service date (OSD) of 2012 and will not be replaced. The MoD has 22 Gazelle in the fleet. The Search and Rescue Sea Kings (Mks 3/3a and 5) will be replaced by a joint PFI with the Maritime and Coastguard Agency. Lastly, the MoD points to “changes in technology and support solutions […] which allow us to provide greater capability with fewer helicopters or through the use of other assets such as UAVs.”29 The MoD bases its plans for the configuration of the Department’s future helicopter fleet on “an assessment of the optimum mix of platforms (both helicopters and other non-rotary platforms) to meet capability requirements.”30

17. Each of the steps intended to improve the operational capability of helicopters as set out in the MoD’s memorandum are quite sensible. However, none of them account for the quite substantial reduction in medium and heavy lift, namely the support helicopters which move troops and equipment around the battlefield. We make an assessment of the future of the support helicopter fleet in the next chapter.

25 National Audit Office, Support to High Intensity Operations, HC 508, Session 2008-09, para 1.16
26 Q 122
27 ibid.
28 Ev 58, para 1.22
29 ibid.
30 ibid.
The three elements of helicopter capability

18. The MoD suggests in its memorandum that (in some cases, at least) it will be possible to deliver “greater helicopter capability with fewer helicopters”.31 This rather counter-intuitive type of argument is often brought up during discussions of military technology in terms of firepower. Indeed, the Minister gave the example of the comparison of a Lancaster bomber with a Joint Strike Fighter.32 He went on to ask

Does it mean that eventually we can have just one or two combat aircraft or helicopters in operation? Of course not. There comes a point when the graph begins to curve rather sharply and you no longer get advantage by replacing numbers with improved technology and effect.33

We are glad that the Minister recognises that improved technology, whilst welcome, is only part of helicopter capability. We set out the three elements of capability in the table below.

Table 1: Three elements of helicopter capability

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<th>Capability</th>
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<td>Individual</td>
<td>The technical specification of the helicopter, as expressed in terms of its ability to lift, move (in terms of range and speed), and fire (if applicable). In this sense, as technology improves, newer types of helicopter become more capable. Individual capability can be increased by upgrades and new procurements.</td>
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<td>Corporate</td>
<td>The ability of the helicopter fleet to support the operations of the UK Armed Forces. It depends on two things: the type capability of the constituent helicopters and the numbers in service and ‘effective’. Together with individual capability, corporate capability is the ‘input’ of helicopter capability. Corporate capability is increased by increasing the size of the effective fleet.</td>
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<tr>
<td>Operational</td>
<td>The ability of deployed helicopters to contribute to operations, or the Minister’s ‘outputs’. Typically expressed in terms of availability or ‘flying hours’, operational capability is increased through improving the support arrangements for helicopters through, for example, closer working with industry, greater availability of spare parts or by having more ground crew able to maintain them.</td>
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What is ‘more’?

19. Brigadier Abraham told us that “Helicopters are like money in your bank account. If you are asked whether you would like some more the answer is always yes. Do you have enough to do what you have to do? The answer is yes.”34 However, ‘what you have to do’ is a very flexible concept, and several highly credible sources have made clear that the current lack of tactical lift is limiting operations. In its report on Support to High Intensity Operations, the NAO expands on the Brigadier’s point, stating that “In Afghanistan, senior commanders on the ground have sufficient helicopters to undertake their key tasks, but greater availability of these helicopters would give them more flexibility in the planning of

31 Ev 58, para 1.22
32 Q 178
33 ibid.
34 Q 138
deliberate offensive operations.”35 During our inquiry into readiness and recuperation, Lieutenant General Sir Graeme Lamb KBE CMG DSO, Commander Field Army, told us that “if I were a commander in Task Force Helmand and had another five Chinooks I would have a chance to manoeuvre in another way.”36 This may appear to be a mere truism, but over the course of our inquiry we have sensed that senior commanders have been reluctant to admit that manoeuvres in-theatre are in any way being limited by the size of the deployed fleet. In other words, Brigadier Abraham’s statement is only true up to a point. The MoD insists that all that is needed is to squeeze a bit more availability out of the fleet and increase the flying hours. However, its duty to make the best use of public money means that the MoD should be doing this anyway – striving to improve availability and efficiency for their own sakes, irrespective of the benefits.

20. We raised the question of numbers and tactics with the Minister, who responded that

I agree that there are certain minimum numbers that you tend to need for any particular tactical purpose, but I do not agree that two airframes are always better than one. For example, I do not suppose for a moment that two Gazelles are better than one Apache. That would be crazy. One Apache is probably better than 10 Gazelles.37

Such a suggestion would indeed be crazy. It would also be a category error, confusing the discrete questions of individual and corporate capability. In its written memorandum, the RAeS argued that “one helicopter can only be in one place at any one time so a reduction in total numbers of helicopters deployed represents a dilemma for a field commander.”38

21. We do not believe that the question of helicopter capability can be properly answered without reference to the size of the fleet. We are concerned that operational commanders in the field today are unable to undertake potentially valuable operations because of the lack of helicopters for transportation around the theatre of operations. We are also concerned that operational commanders find they have to use ground transport, when helicopter lift would be preferred, both for the outcome and for the protection of our forces. Furthermore, we are troubled by the forecast reduction in numbers of medium and heavy lift battlefield helicopters, which will make this worse. We have an additional concern in respect of the apparent lack of training that is taking place for amphibious operations.

35 National Audit Office, Support to High Intensity Operations, HC 508, Session 2008–09, para 1.21
36 Oral evidence taken before the Committee on 3 February 2009 for it’s inquiry into Readiness and recuperation of the Armed Forces, HC (2008–09) 122–i, Q 103
37 Q 177
38 Ev 49, para 5
3 Aircraft and support

Aircraft

Types and marks

22. Table 1 in the MoD’s written evidence to us sets out the helicopters currently in use with the Armed Forces.39 Of the types of helicopter in service, several have subset marks. There are, for example, four different marks of Lynx, three of Merlin and five of Sea King. Beyond this, as additional equipment is added through the Urgent Operational Requirement (UOR) process, the coherence of the fleet is reduced further, which impacts upon how easily they can be maintained. Mr Nick Whitney of AgustaWestland told us that

Where you get problems I think is when you modify smaller batches of aircraft within those fleets. That is when you get the problems in terms of support. You get a different mark of aircraft and this is particularly relevant when you are on operational deployment and you are looking to fit certain pieces of equipment for operations that you will not fit to the rest of the fleet. That can give difficulties in terms of support and maybe training and other areas and lines of development.40

23. Several of the organisations which submitted written evidence to us argued that a fleet with fewer types of helicopters would be more capable, easier to support and cheaper to run. The Society of British Aerospace Companies wrote that “a fleet which consists of a wide variety of aircraft is likely to incur significant costs in terms of maintenance and support. A more standardised fleet maximises value for money and introduces broad cost savings across all the lines of development.”41 This point was echoed by Mr Nick Whitney of AgustaWestland in oral evidence, when he said that

There is a fixed cost associated with operating aircraft. The more aircraft you have, the more you spread that fixed cost across your fleet. Equally, the points you raise about having small fleets, the training burden and the additional cost that that incurs, the problems that that incurs can all be solved by having reduced numbers. You need the budget to be able to make that happen.42

24. The MoD is planning to reduce the number of different helicopter types through a programme of retiring some obsolete models and consolidating others. The introduction of Future Lynx will reduce the number of Lynx helicopters from four sub-types to two, and plans for a ‘Future Medium Helicopter’ (FMH) will, if proceeded with, consolidate Sea King Mk 4 and Puma into one type with battlefield and maritime marks. Other helicopter types such as Chinook and Apache have plenty of life left in them and can have their OSDs pushed back through a mixture of capability sustainment (CSP) and life extension (LEP)
programmes. Enclosure 1 to Section 2 of the MoD’s written memorandum to us illustrates the current plans for the provision of helicopter capability in the medium term.43

**Extending and sustaining**

25. If the life of one type of useful platform can be extended by replacing and upgrading particular parts at a reasonable cost, then it is entirely sensible as a general principle. There are, however, cases when life extension programmes are not the right choice. During the inquiry into *Future Capabilities* conducted by our predecessor Committee, the then Chief of the Air Staff (now Chief of the Defence Staff) Air Chief Marshal Stirrup said that

> In terms of the overall efficiency of the helicopter force, the sooner we can reduce the overall numbers of types, the more output we will get from the force as a total. It is not just a case of extending old types in service to meet the requirement, that is not necessarily the most efficient way of doing it.44

26. The MoD currently plans to extend the lives of the Puma and Sea King Mk 4 fleets, in order to bridge the gap between now and the introduction of FMH between 2017 (for the maritime version replacing Sea King Mk 4) and the early 2020s (for the battlefield version replacing Puma). We raised specific concerns with industry witnesses on 19 May with reference to the proposed extension to the life of the Puma fleet. Answering the general question of how the decision to extend a legacy airframe or not is taken, Mr Nick Whitney from AgustaWestland explained that

> Industry will have a requirement to upgrade an aircraft and we will upgrade that to within the design specification that is laid upon us. That may or may not prove possible. If you require full crashworthiness on an old aircraft that may not be possible because physically the structure is incapable of being upgraded to that point.45

27. On the specific question of the Puma LEP, Mr Derek Sharples from Eurocopter told us that the project would “see the aircraft re-engined; new avionics systems; new digital autopilot; it will see new engine control systems; new tail rotor blades; a strengthened tail.”46 These improvements would undoubtedly make Puma a better helicopter, but would not affect the aircraft’s crashworthiness and aspects of survivability. At our second session on 2 June, the Minister said that he “did not like the sound” of using crashworthiness as a factor, as he “would not dream of flying any helicopter that we were not absolutely certain was as safe as it possibly could be”.47 This sounded to us as if the MoD had begun to share our doubts as to whether extending the lives of both Sea King Mk 4 and Puma would really be a sensible course of action to take, taking account of the age of the Sea King and the survivability of passengers in the Puma in the event of an uncontrolled landing. The

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43 Ev 70
45 Q 42
46 Q 46
47 Q 160
Minister admitted that proceeding with the LEP would result in “extended exposure to risk”\textsuperscript{48}.

28. The Minister acknowledged this possible risk when he revealed that in fact, he had asked for a complete re-examination of this matter which admittedly is at the eleventh hour. It does not mean to say that we are to go in a different direction; we may go back to the model that I have just set out which is the formal position of the department today. We do not have any consents from the Treasury or anywhere else to go in any other direction and I may not seek them. It may be that we shall decide to go in another direction even at the eleventh hour but we shall do it without holding up matters at all, so we shall take decisions very rapidly. The alternative, which I want to ensure we fully explore, is the possibility of dispensing with the need to spend the taxpayers’ money on upgrading aircraft which have reached a certain age. The Pumas must be 30 years’ old.”\textsuperscript{49}

He went on to expand on this statement, saying that what was being discussed was “bringing forward the future medium helicopter procurement which would then certainly need to be done on a modified off-the-shelf basis”.\textsuperscript{50} If it went ahead, it would “not be quite a UOR but possibly not the rather laborious full-scale classic international tender which up to now has been the policy and formally remains the procurement policy for the future medium helicopter”.\textsuperscript{51} Finally, he said that he wanted “to make absolutely sure we have fully explored the alternative before we sign contracts. In any event we shall be signing contracts in the course of this year.”\textsuperscript{52} \textbf{While we are grateful to the Minister for raising with us his uncertainties about the decision to extend the life of Puma, we do not feel that we were given the full picture on this issue by other witnesses. We very much regret this.}

\underline{The next ten years}

29. In 2004, the National Audit Office produced a report on \textit{Battlefield Helicopters} in which it calculated that there was a 38\% deficit in available helicopter lift, which would continue until 2017/2018.\textsuperscript{53} Over the course of our inquiry, it became evident that the biggest long term challenge was in the support helicopter fleet. The deficit emerges in the form of the Sea King Mk 4 and Puma fleets. Battlefield lift is predominantly provided by the RAF in the form of Puma, Merlin, and Chinook. The CHF provides the Sea King Mk 4, which is capable of both battlefield and seaborne amphibious support. Over the next ten years, numbers of Mk 3 and 3a Merlin are expected to remain the same, as long as the Capability Sustainment Programme is agreed to. If the Chinook fleet suffers no losses, it too will remain the same, but will be augmented by the addition of the eight ‘reverted’ Chinook Mk 3 procured in the early nineties.
30. It is worth noting that, even with the LEP, there is a serious question mark over whether Puma, even in its upgraded form, would be of limited utility in combat operations. Given the age of both Sea King and Puma and the poor survivability of the Puma, extending their lives at considerable cost is not the best option, either operationally or in terms of the use of public money. We do not believe that these LEPs will provide adequate capability or value for the taxpayer. Only a procurement of new helicopters can meet the original objective of reducing the number of types of helicopter in service within the UK Armed Forces.

Support

Urgent Operational Requirements

31. In its written memorandum, the MoD explains that

Whereas the Equipment Programme is designed to deliver long-term core capabilities that can be employed globally to meet a range of potential future threats, the intention of UORs is to adapt and respond quickly to unforeseen requirements specific to particular operational environments and emerging threats—for example as a result of the enemy forces’ developing techniques, tactics and procedures.54

In our Report on Defence Equipment 2009, we concluded that “the Urgent Operational Requirement (UOR) process has continued to prove highly effective in enabling vital equipment to be provided in quick time to our Armed Forces in Afghanistan and Iraq.”55 The helicopter fleet has benefited from significant improvements delivered through the UOR process, for example:

- the fitting of improved Defensive Aids Suites;
- the upgrading to ‘Carson’ rotor blades on the Sea King Mk 4;
- the fitting the Merlin Mk 3 with the British Experimental Rotorcraft Programme (BERP) Mk 4 blades;
- the addition of Display Night Vision Goggles to the Sea King Mk 4 and Merlin Mk 3; and
- the upgrading of the engines of 22 Lynx Mk 9 with the Rolls-Royce T800 engine.56

32. All of these are welcome. The National Audit Office notes that “[n]one of the helicopter types were designed specifically to undertake missions in hot and dusty countries such as Iraq and Afghanistan”,57 and furthermore, that “[t]he mountainous nature of Afghanistan also means that helicopters are forced to fly at higher altitudes where the air is thinner and greater engine and rotor-blade performance is required.”58 The improvements to rotor-

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54 Ev 75, para 3.27  
56 Ev 75, para 3.30  
57 National Audit Office, Support to High Intensity Operations, HC 508, Session 2008–09, para 1.18  
58 ibid.
blades and engines will doubtless decrease the frequency of occasions on which it is simply too hot to get a helicopter off the ground with the required load on board, but it remains to be seen just how much of a difference it makes over the hottest part of the year.

33. Over the course of our written and oral evidence-taking, two primary concerns on the issue of UORs emerged: the first, their impact upon coherency, and the second, the question of ‘theatre-entry standards’. SELEX Galileo drew attention in its written memorandum to the procurement of Defensive Aids Suites (DAS) as an example of a time when a less disruptive strategy could have been adopted.\textsuperscript{59} In her evidence to us, Dr Beatrice Nicholas from SELEX Galileo explained that she believed the specification for the UOR was “often interpreted extremely narrowly”, which had implications for future coherency.\textsuperscript{60} We raised the question of the impact of UORs upon coherency and the creation of so-called ‘fleets within fleets’ with the Minister, and he admitted that

UORs always do raise the issue of coherence because the theory is that you are buying something for just one particular campaign and operation and may not want to have it as part of your core defence capability. That is the theory of it, but in practice you may well say that there are other insurgency-type operations in similar conditions and that something you have purchased for one particular UOR ought to be kept in permanent inventory and you should maintain the support, spares, training and so forth accordingly.\textsuperscript{61}

34. The question over theatre-entry standards arose in the course of our visit to Middle Wallop and Yeovilton. Both air and ground crew told us that there were significant differences between the aircraft available in the UK for training and familiarisation and those deployed in-theatre. However, when we put this to the Minister, he went to great length to assure us that

[I]t is an absolute principle when we buy new equipment under the UOR, apart from the core defence programme, that we buy sufficient number to ensure people can be trained on exactly that type of equipment. This goes across the board; it is not just helicopters. We always specify the numbers and amounts of equipment we need to procure taking into account the training programme so we do not have anybody going out to theatre who has not been trained on the type of equipment, whether it is weapons, communications equipment, armoured vehicles or what have you, with which they will then be working in Afghanistan. In the best run organisation something sometimes may just fall between the cracks. I trust that has not happened on this occasion. We will pursue it. That is an absolute principle. Sometimes I have expressed frustration because we cannot get more of something out into theatre—I will not say what it is—and I am told, “No, Minister; we really need this number here for training.” We have that dialogue the whole time. We take the training requirement very seriously and do not want our men and women to go out to Afghanistan and run any risk at all because they are suddenly confronted with something on which they have not already been properly trained. It is an absolute

\textsuperscript{59} Ev 40, paras 13–17
\textsuperscript{60} Q 82
\textsuperscript{61} Q 180
principle that before we send anybody out to a war zone they are given the best possible training on exactly the kit they will use in theatre.\textsuperscript{62}

35. We welcome the Minister’s assurance that he is committed to minimising the difference between the equipment standards on an Apache in the UK and an Apache in Helmand. The MoD should commit to making training aircraft as close to the theatre-entry standard as is affordable, and we realise that this might be achieved by fitting improved systems on training aircraft in the United Kingdom or by teaching key pilotage techniques on unmodified aircraft.

\textit{Industry’s role}

36. The MoD’s relationship with the helicopter industry is described in the Defence Industrial Strategy (DIS), published in December 2005.\textsuperscript{63} In our Report on Defence Equipment 2009, we recorded that “[a] key objective of the DIS was to move to a Through Life Capability Management (TLCM) approach to acquiring and managing defence equipment programmes”,\textsuperscript{64} but noted that “some industry representatives have raised concerns that the TLCM approach has not been fully embedded”.\textsuperscript{65} We took evidence on both the current status of DIS and TLCM in the course of our inquiry.

37. It was clear to us from the evidence that we took that Industry’s position on DIS is best characterized as anticipatory. It was striking both how easily industry referred to DIS in the past tense, and how there seemed to be consensus that a new version was necessary. Mr David Pitchforth told us that Boeing, which works with the MoD on the highly successful Chinook TLCM programme,

embraced the Defence Industrial Strategy as a good thing, which gave clarity to industry; and we have invested because of it and we would actually like to see that strategy reinvigoured and picked up and moved forward again so we can continue to use it as a roadmap to how we should be engaging with the Ministry of Defence.\textsuperscript{66}

He later added that

I think there is another version of the Strategy which is imminent, I guess, and we would be interested to know what that says about some of these other points that would need addressing.\textsuperscript{67}

38. This perspective was consistent with the written evidence submitted by the RAeS which expressed concern that “ambiguity in the Defence Industrial Strategy and associated Defence Technology Strategy might lead to a long term erosion of the UK’s rotorcraft defence technological and industrial base.”\textsuperscript{68} The recent Ministerial reshuffle within the

\begin{itemize}
\item \textsuperscript{62} Q 186
\item \textsuperscript{63} Ministry of Defence, \textit{Defence Industrial Strategy}, CM 6697, December 2005, pp. 90–94
\item \textsuperscript{64} HC (2008–09) 107, para 196
\item \textsuperscript{65} \textit{ibid.}, para 197
\item \textsuperscript{66} Q 57
\item \textsuperscript{67} Q 59
\item \textsuperscript{68} Ev 50, para 13
\end{itemize}
MoD saw the return of Lord Drayson as Minister of State for Strategic Defence Acquisition Reform, with responsibility for Defence Acquisition Reform, Defence Science and Technology and the Defence Industrial Strategy. Whether this indicates a revitalisation of the long-awaited DIS 2.0 remains to be seen, but it seems unlikely that any progress on DIS will be completed before the Minister’s deadline of “the end of the year” for signing contracts on either the medium-lift LEPs or a modified-off-the-shelf-FMH substitute. We were concerned to hear from industry that the Defence Industrial Strategy, so far as it relates to helicopters, needs to be ‘picked up and moved forward again’. The loss of momentum in relation to the Defence Industrial Strategy may lead to significant acquisitions in this sector taking place without sufficient reference to the DIS. This would be regrettable if it prevented greater rationalisation of helicopter types for the reasons we set out above. We urge the MoD to avoid this if at all possible.

39. On the positive side, closer working between the MoD and industry has proven highly beneficial. Integrated Operational Support and Through-Life Capability Management have both paid dividends in terms of available flying hours. Mr Nick Whitney from AgustaWestland explained to us that “[w]ith the new contracting methods, there is incentivisation on the industry to improve the product through-life. Previously that has not happened […] These long-term support contracts equally allow that to happen with much greater urgency and much greater effect.” He concluded that “[b]usiness needs predictability; and the Ministry of Defence obviously needs flexibility and it is a balance. I think the IOS arrangements allow us to strike the right balance with improved value for money.” Mr David Pitchforth gave us an example of the benefit that Boeing had been able to deliver, when he said that “[w]hen we took that [TLCS] on three years ago we contracted for 12,000 flying hours of Chinook. The RAF had never achieved 12,000 hours at the point when we took over the contract. We are now heading towards 16,000 hours with a target of going even higher than that in the future.”

40. An additional benefit of IOS and TLCM is the opportunity it provides for contractor staff to work in-theatre as part of a CONDO (Contractors ON Deployed Operations) scheme. Mr Paul O’Hara from Rolls-Royce explained to us that “[i]f you have deployed service engineers forwards with the units that are actually utilising the equipment you can actually stop something that would be coming back and therefore could be quite a costly rejection.” Dr Beatrice Nicholas from SELEX Galileo described CONDO operations as “very motivating for our staff”. Mr Declan O’Shea told us that Vector Aerospace had people in Afghanistan as we speak. In December we were requested to assist through the project team and Boeing with people in Afghanistan and in early March we deployed eight people to there. We did the proper due diligence, the duty of care and we asked for volunteers and got many people who volunteered and we rotate those every four months for as long as we are required there. Certainly it is a motivational issue for our staff; they feel that they are part of the system that is being deployed.

69 Q 24
70 Q 61
71 ibid.
72 Q 77
73 ibid.
They see the aircraft in action as well as in the hangars and we are delighted to be involved in it.74

41. At our second session, Rear Admiral Johnstone-Burt confirmed that the Vector team was “making a tangible difference”.75 On support, closer working between the military and industry through IOS and TLCM programmes is clearly the way forward. We were impressed by the reports we had from companies of CONDO operations, particularly with regard to their consequences for process improvement and cost effectiveness through early interventions. We encourage the MoD to capitalise upon lessons learned from the success of the Chinook Through Life Capability Service programme.

Spare parts

42. One area where support has struggled, however, has been in the provision of spare parts. The NAO recorded in its report on Support to High Intensity Operations that shortages of spare parts were particularly affecting Merlin and Apache, as “[t]he initial procurement of spares for both helicopters is still being delivered from industry and as a consequence there are some key components in short supply.”76 This led to the MoD having to cannibalise helicopters based in the UK—a decision very much of last resort—in an effort to keep those helicopters deployed on operations in the air. Mr Derek Sharples from Eurocopter told us that “[i]t is quite common for 80% of all spares to be on stock for more than three years and never called. So you have a very small number of high rotating parts, and a very large percentage of slow movers.”77 Mr Nick Whitney from AgustaWestland explained why these shortages had arisen, when he told us that

I think the simple answer why is that there are insufficient spares that have been procured in first instance. We are operating aircraft in theatres that are more challenging than the assumptions that were taken. If you certainly take the case of Apache, it is fielded in theatre many years ahead of that which was planned. Inevitably you work on the basis that you are going to have an increasing training and flying burden, and you plan your spares procurement around that accordingly. In the instance of Apache you ramp that up, as a result of the conflicts that we are currently in, significantly above that which was planned.78

43. The NAO wrote in its report that the MoD judged that “the benefits of deploying Apache early outweighed the risk posed by the lack of spare parts.”79 The urgent action being taken within the MoD to improve the acquisition and delivery of spares to all helicopters in theatre needs to be given top priority.

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74 Q 92
75 Q 94
76 National Audit Office, Support to High Intensity Operations, HC 508, Session 2008–09, para 1.17
77 Q 14
78 Q 19
79 National Audit Office, Support to High Intensity Operations, HC 508, Session 2008–09, para 1.17
4 People and training

People

Harmony

44. We noted previously Rear Admiral Johnstone-Burt’s identification of people as the ‘least robust’ leg of the ‘capability stool’. The deployment of personnel on operations is governed within each of the services by ‘harmony guidelines’, which aim to provide sufficient time within an extended cycle to cater for operations, training and leave. Each of the services have, largely for historical reasons, different guidelines. We were told that not all fleets were achieving the JHC target of a ‘rule of five’, that is, one tour on followed by four tours off. The Sea King and Apache fleets are currently operating on rules of three and four, which does not allow for adequate decompression, training, leave and preparation for the next tour. Nor has the pressure of repeated deployments been without consequence in terms of retention. Nevertheless, the Admiral told us that he had found that

Retention is not as bad as I thought it would be. At the moment, compared with the service averages in the Army and Royal Air Force it is very small. We talk about the premature voluntary release (PVR) rate; in other words, the rate at which people resign earlier than they would otherwise. For the Army and RAF it is a fraction, which is surprising. For the Navy it is slightly higher than the average for officers and about average for the other ranks.80

Retention

45. In evidence, the Minister told us that he had been consulting with regard to “what we can do to improve retention and recruitment and we are making some substantial changes in those areas”.81 This was something that the Admiral had already alluded to in his earlier evidence

We are also looking at ways to retain our senior NCO air crew who are gold dust with massive hours of experience and are fabulous pilots. We are looking at ways to improve their pay scales and pension rights to encourage them to stay on longer than they might otherwise. In terms of the engineering shortages again we are looking across all three services and all my fleets at the moment. It is interesting that the Royal Navy and Air Force are overmanning us in terms of our engineering support in order to enable us to cope with the gaps and shortfalls, but that means drawing people from the rest of their core area. As far as the Army Air Corps is concerned the Royal Electrical and Mechanical Engineers are helping us by doing a review—the Apache, Lynx and also UAVs are our top priority—to make sure we get them fully manned as best we can.82

80 Q 111
81 Q 195
82 Q 109
46. Rear Admiral Simon Charlier, who told us that “[w]hen we have surge operations, particularly in this joint environment, it is quite right to place a priority on that and take the hit elsewhere in the Navy.”

Operations in Afghanistan have now been made the highest priority, what is known as a ‘campaign footing’, but this has stretched the manning of the helicopter fleet. It is therefore unfeasible to surge helicopters into theatre. Joint Helicopter Command is to be commended for its efforts in delivering trained manpower to the front line, and then giving personnel sufficient time to do all the things at home that enable them to go back for repeat tours. However, we believe it essential that the parent Services examine the basic manning levels to enable personnel from all three Services to be deployed and rested on an equitable basis.

Training

Training pipelines

47. The MoD’s memorandum states that the three Armed Services maintain full command of the recruitment and training of their helicopter personnel. Aircrew applicants for all three Services are subjected to medical screening, aptitude testing and flying grading before attending a selection board. All aspiring pilots begin with elementary flying training, first jointly for six weeks at RAF Cranwell and then for between 13 and 26 weeks with their ‘home’ Service, before being divided into either the Fast-Jet, Rotary or Multi-Engine streams. Rotary pilots then go on to the joint Defence Helicopter Flying School at RAF Shawbury. In its written memorandum to our inquiry into Recruiting and retaining Armed Forces personnel, the MoD wrote that “the situation with Support Helicopter crewmen is also finely balanced, although action taken recently to streamline the training regime has released crewmen to the front-line earlier”.

48. The early stages of pilot training have been “the subject of several reviews”. Training at Shawbury comprises a combination of Ground School and flying training—all pilots are trained in both Single Engine Basic Rotary Wing and Single Engine Advanced Rotary Wing flying, with RAF pilots being given further training on Multi-Engine Advanced Rotary Wing—before transferring to Operational Conversion Units, where they are trained on the specifics of the aircraft they will fly in theatre and in the tactics and techniques required to support the full range of flying required of a helicopter pilot. Having completed OCU, pilots are designated ‘Limited Combat Ready’, and progress to full ‘Combat Ready’ whilst with their Units. Training for technicians is far more diverse, and covered in detail in the MoD’s memorandum.
Theatre-entry standards

49. The question of the difference between the aircraft that are used for training in the UK and those equipped with all the latest UORs which are deployed in theatre arose during our visit to Middle Wallop and RNAS Yeovilton. We described this problem in the context of the UORs earlier in this Report, where we also noted the Minister’s commitment to minimise the gap. We also took evidence on this issue during our session with industry. On the question of the difference between training and theatre-entry standard aircraft, Mr Derek Sharples from Eurocopter told us that “it would not be cost-effective to use the same aircraft for training, in particular for basic training, as is used front line, because of course these are very expensive and sophisticated weapons systems.” However, he seemed later to concede that some familiarity would be beneficial, saying “you should where possible familiarise on systems which are similar to those you will operate in-theatre. It is clearly cost-effective; it is clearly more efficient training; and it clearly brings to the pilot more familiarisation with the systems that they will ultimately be asked to operate in battle.”

This point was echoed by Mr Alex Sharp from Sikorsky, who commented simply that “the more commonality you have in training, clearly gives you benefits in the field – no question.” Increased joint working between the three Services has shown benefits in the same way that increasingly close working between the military and industry has done. We recommend that the MoD presses ahead with its programmes to consolidate and make more common the various schemes in place for training helicopter air and ground crew. The MoD should take steps to eliminate the time lag between delivery of UORs in theatre and the upgrading of equipment at home. In this respect, it is unacceptable for personnel to encounter new equipment for the first time in theatre.
5. Towards a Strategic Defence Review

50. On 7 July, the Secretary of State made a written ministerial statement in which he set out the Government’s proposals for a new strategic defence review to take place early on in the next Parliament.92 He announced the publication of a Green Paper in early in 2010 which would, amongst other things, consider lessons “learned from recent operations and the changing character of conflict”, “technological changes in defence”, and “the modern day requirements on and aspirations of our armed forces personnel”.

51. We welcome the Government’s announcement of a strategic review of defence, the need for which has long been apparent. The case for better resourcing of helicopters has however, already been made clear. The MoD should not use the announcement of the strategic review to delay the important decision which needs to be taken in relation to the acquisition of the Future Medium Helicopter, albeit on a modified off-the-shelf basis. The time has come to appreciate fully the role of helicopters in modern operations. We expect the Government to stop equivocating over the separate concepts of ‘capability’, ‘capacity’, and ‘availability’. The MoD should seize the opportunity to recognise the importance of helicopters to current and contingent operations, and work towards strengthening all aspects of capability: the number of helicopters in the fleet, the support structure that underpins their operations, manning, both in the air and on the ground, and finally, the training for the full spectrum of capabilities described by the review itself.

92 HC Deb, 7 Jul 2009, Col 39WS
Conclusions and recommendations

Our inquiry

1. Our visit to Middle Wallop and Yeovilton proved invaluable and we record our thanks to all those involved. Our discussions that day have informed our oral evidence sessions, and indeed, this Report. (Paragraph 2)

Why helicopters?

2. Helicopters provide many vital capabilities to the modern Armed Forces and, with the challenge of hybrid warfare, are becoming increasingly relevant to current and contingent operations. Their status as force-multipliers lends further weight to their value. They are a cost-effective means of increasing the operational impact of other force elements and therefore, of operational capability generally. As such, it is essential that the fleet should be ‘fit for purpose’, both in terms of quality and quantity. (Paragraph 5)

Helicopters in the UK Armed Forces

3. Significant improvements have been made to the availability of key assets such as Chinook. However, in the longer term, increased availability will be no substitute for additional capacity. Adequate capability is also a question of numbers of airframes. (Paragraph 11)

What is more?

4. We do not believe that the question of helicopter capability can be properly answered without reference to the size of the fleet. We are concerned that operational commanders in the field today are unable to undertake potentially valuable operations because of the lack of helicopters for transportation around the theatre of operations. We are also concerned that operational commanders find they have to use ground transport, when helicopter lift would be preferred, both for the outcome and for the protection of our forces. Furthermore, we are troubled by the forecast reduction in numbers of medium and heavy lift battlefield helicopters, which will make this worse. We have an additional concern in respect of the apparent lack of training that is taking place for amphibious operations. (Paragraph 21)

Aircraft

5. While we are grateful to the Minister for raising with us his uncertainties about the decision to extend the life of Puma, we do not feel that we were given the full picture on this issue by other witnesses. We very much regret this. (Paragraph 28)

6. Given the age of both Sea King and Puma and the poor survivability of the Puma, extending their lives at considerable cost is not the best option, either operationally or in terms of the use of public money. We do not believe that these LEPs will provide adequate capability or value for the taxpayer. Only a procurement of new
Helicopter capability

Paragraph 30

Support

7. We welcome the Minister’s assurance that he is committed to minimising the difference between the equipment standards on an Apache in the UK and an Apache in Helmand. The MoD should commit to making training aircraft as close to the theatre-entry standard as is affordable, and we realise that this might be achieved by fitting improved systems on training aircraft in the United Kingdom or by teaching key pilotage techniques on unmodified aircraft. (Paragraph 35)

8. We were concerned to hear from industry that the Defence Industrial Strategy, so far as it relates to helicopters, needs to be ‘picked up and moved forward again’. The loss of momentum in relation to the Defence Industrial Strategy may lead to significant acquisitions in this sector taking place without sufficient reference to the DIS. This would be regrettable if it prevented greater rationalisation of helicopter types for the reasons we set out above. We urge the MoD to avoid this if at all possible. (Paragraph 38)

9. On support, closer working between the military and industry through IOS and TLCM programmes is clearly the way forward. We were impressed by the reports we had from companies of CONDO operations, particularly with regard to their consequences for process improvement and cost effectiveness through early interventions. We encourage the MoD to capitalise upon lessons learned from the success of the Chinook Through Life Capability Service programme. (Paragraph 41)

10. The urgent action being taken within the MoD to improve the acquisition and delivery of spares to all helicopters in theatre needs to be given top priority. (Paragraph 43)

People

11. Operations in Afghanistan have now been made the highest priority, what is known as a ‘campaign footing’, but this has stretched the manning of the helicopter fleet. It is therefore unfeasible to surge helicopters into theatre. Joint Helicopter Command is to be commended for its efforts in delivering trained manpower to the front line, and then giving personnel sufficient time to do all the things at home that enable them to go back for repeat tours. However, we believe it essential that the parent Services examine the basic manning levels to enable personnel from all three Services to be deployed and rested on an equitable basis. (Paragraph 46)

Training

12. Increased joint working between the three Services has shown benefits in the same way that increasingly close working between the military and industry has done. We recommend that the MoD presses ahead with its programmes to consolidate and make more common the various schemes in place for training helicopter air and ground crew. The MoD should take steps to eliminate the time lag between delivery
of UORs in theatre and the upgrading of equipment at home. In this respect, it is unacceptable for personnel to encounter new equipment for the first time in theatre. (Paragraph 49)

Towards a Strategic Defence Review

13. We welcome the Government’s announcement of a strategic review of defence, the need for which has long been apparent. The case for better resourcing of helicopters has however, already been made clear. The MoD should not use the announcement of the strategic review to delay the important decision which needs to be taken in relation to the acquisition of the Future Medium Helicopter, albeit on a modified off-the-shelf basis. The time has come to appreciate fully the role of helicopters in modern operations. We expect the Government to stop equivocating over the separate concepts of ‘capability’, ‘capacity’, and ‘availability’. The MoD should seize the opportunity to recognise the importance of helicopters to current and contingent operations, and work towards strengthening all aspects of capability: the number of helicopters in the fleet, the support structure that underpins their operations, Manning, both in the air and on the ground, and finally, the training for the full spectrum of capabilities described by the review itself. (Paragraph 51)
Formal minutes

Tuesday 14 July 2009

AFTERNOON SESSION

Members present:

Mr James Arbuthnot, in the Chair

Mr David Crausby  
Linda Gilroy  
Mr David Hamilton  
Mr Mike Hancock  
Mr Dai Havard  
Mr Bernard Jenkin  
Mr Brian Jenkins  
Robert Key  
Richard Younger-Ross

Draft Report (Helicopter capability), proposed by the Chairman, brought up and read.

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

Paragraphs 1 to 51 read and agreed to.

Summary 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.

Written evidence was ordered to be reported to the House for printing with the Report, together with written evidence reported and ordered to be published on 19 May and 7 July.

[Adjourned till Monday 20 July at 4.00 pm]
Witnesses

Tuesday 19 May 2009

Mr Nick Whitney, Senior Vice President, UK Government Business Unit, AgustaWestland Mr David Pitchforth Managing Director, Boeing UK Rotorcraft Support, Mr Derek Sharples, Vice President of Customer Support, Eurocopter and Mr Alex Sharp, Regional Sales Manager – Europe, Sikorsky Aircraft Corporation

Ev 1

Tuesday 2 June 2009

Rear Admiral Simon Charlier, Chief of Staff, Carrier-Strike and Aviation, Rear Admiral Tony Johnstone-Burt OBE, Commander, Joint Helicopter Command, and Brigadier Kevin Abraham, Head of Joint Capability, Ministry of Defence

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Mr Quentin Davies MP, Minister for Defence Equipment and Support, Mr Adrian Baguley, Head of Helicopters 2, and Commodore Russ Harding, Head of Equipment Capability (Air & Littoral Manoeuvre), Ministry of Defence

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\(^A\) Government response published as a Memorandum in the Committee’s Fourth Report (HC 301)

\(^b\) Government response published as a Memorandum in the Committee’s Ninth Report (HC 773)

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Oral evidence

Taken before the Defence Committee

on Tuesday 19 May 2009

Members present
Mr James Arbuthnot, in the Chair
Linda Gilroy
Mr David Hamilton
Mr Mike Hancock
Mr Bernard Jenkin
Robert Key
Mrs Madeleine Moon

Witnesses: Mr Nick Whitney, Senior Vice President, UK Government Business Unit, AgustaWestland, Mr David Pitchforth, Managing Director, Boeing UK Rotorcraft Support, Mr Derek Sharples, Vice President of Customer Support, Eurocopter and Mr Alex Sharp, Regional Sales Manager—Europe, Sikorsky Aircraft Corporation, gave evidence.

Q1 Chairman: Good morning. Could I ask you please to introduce yourselves and to just give a very brief outline of the industry you are here to represent. Who would like to begin?

Mr Sharples: My name is Derek Sharples. I am the Executive Vice President for Support and Services in the Eurocopter group of companies. I am here today representing the Eurocopter manufacturer, the original equipment manufacturer and supplier of Eurocopter products to the UK Armed Forces.

Mr Pitchforth: I am David Pitchforth. I work for the Boeing company and I am the Managing Director of UK Rotorcraft Support here in-country; and I am here to represent Boeing as we stand with our UK footprint.

Mr Whitney: Good morning, Chairman. My name is Nick Whitney. I am Senior Vice President for the UK Government Business Unit within AgustaWestland. I am responsible for MoD business for AgustaWestland.

Mr Sharp: Good morning, Chairman. Alex Sharp, Sikorsky Aircraft in the United States. I am the Regional Sales Manager for Western Europe.

Chairman: Thank you. We have this session which will last for about an hour with you, and then we will move on to some representatives of other companies. Are there any declarations of interest?

Mr Jenkin: Chairman, may I draw attention to an entry on the Register of Members’ Interests under “miscellaneous and unremunerated items”. I organised a charitable event for combat stress earlier this year; it was sponsored by Finmeccanica.

Mrs Moon: Perhaps I should declare that I did an Industry and Parliament Trust fellowship, part of which was with Finmeccanica.

Q2 Chairman: Could you please explain, and let us start at the other end, which UK helicopters you currently are involved in, and which projects your companies are involved in?

Mr Sharp: I am pleased to be here; thank you for allowing me to come and speak with you. Sikorsky has had a long history in the UK. If you go back almost 50 years, Sikorsky actually manufactured the first helicopter that was used by the UK military, the R-4. Subsequently, under licence to Agusta or to Westland at the time, a number of helicopters, S-51, S-55, S-58 Wessex and the S-61 Sea King, were all built under licence here. We are currently involved with marketing, of course, to MoD on potential platforms that are used by the US Government in the Middle East; and to that end we are here to support and give testimony as to what helicopters might fit best and work best for the British.

Mr Whitney: Principally, we support a number of rotorcraft platforms. If we look at Apache, the attack helicopter which is actually doing good service in Afghanistan as we speak; the Merlin Mk1 which is in service with the Royal Navy; the Merlin Mk3 which is in service with the RAF, but also in service in Iraq; we also support the Sea King aircraft in terms of its role with the RAF in search and rescue; and the Mk4 aircraft in Afghanistan, and the Royal Navy. We also support the Gazelle; and we have had involvement with Puma. We do a number of modifications; and we are also installing modifications on some Chinook airframes.

Q3 Chairman: While you support some of them, you make some of them as well? There is a distinction.

Mr Whitney: We have manufactured Apache, Merlin, Sea King and we support the other aircraft. We do not manufacture Chinook.

Q4 Chairman: Mr Sharp, the Sea King is a Sikorsky design?

Mr Sharp: Yes.

Mr Pitchforth: We are primarily involved in the Chinook aircraft, which we are the manufacturers of. We also support that aircraft here for the UK through our Through-Life Capability Management service; and have a number of other projects to do with the Chinook which are to do with modification of the UK fleet: the Mk3 project; and also the Julius Project. We act as a sub-prime to AgustaWestland for the design authority of the Apache aircraft, which was made under licence by Westland Helicopters at the time.
Mr Sharples: Chairman, thank you very much for this opportunity to address you this morning. Eurocopter is the world’s largest manufacturer of helicopters. Last year we delivered 585 helicopters to a market base of 2,500 customers around the world in 140 countries. In the United Kingdom our fleet in service is more than 400 helicopters, representing about 42% of the UK fleet of helicopters.

Q5 Chairman: You are talking there about the civilian fleet?

Mr Sharples: Generally it is civilian and military. In the military fleet in the UK Armed Forces, we have 122 helicopters in service, including 44 Puma HC1s, more than 40 Gazelles and 38 helicopters at the Defence Helicopter Flying Training School in Shawbury. We also support and supply helicopters to the UK Police Forces. 27 UK Police Forces operate our helicopters. In terms of contracting, we are involved through the TLS, the Through-Life Support Contract, to support all of the UK Armed Forces’ Pumas and Gazelle helicopters; in total 44 Pumas and 119 Gazelle helicopters. Of course we are a preferred bidder and down-selected for the Future Life Extension Programme for the Puma helicopter fleet in the RAF.

Mr Whitney: Chairman, could I just make one other point. I have omitted to mention of course that we also provide and support the existing Lynx aircraft; and indeed the new aircraft which has now been renamed the Wildcat, which is currently in build.

Chairman: I think we knew that, but thank you for reminding us. We have a lot of questions to ask and we have less than an hour to get through them. You do not need each of you to answer each of the questions. If you feel that the point you would have made has already been made, there is no need to say it again; there is no need to come in on everything.

Q6 Mr Crausby: Of the nearly 600 helicopters that we own, I understand we have 17 different types and within those types there are several subset marks: for example, we have four different marks of Lynx, three of Merlin, five of Sea King. So many subsets are bound to cause problems. Can you describe to us some of the problems that arise from having so many fleets within fleets?

Mr Whitney: There are good reasons for having fleets of aircraft and fleets within fleets. If we look at the Merlin aircraft we have a number of aircraft that were procured for the RAF. We have added to that with six aircraft coming with a separate designation, but operate alongside them. There are 44 aircraft that were originally procured for the Merlins; so you end up with a designation Mk1, Mk3, Mk3a. Where you get problems I think is when you modify smaller batches of aircraft within those fleets. That is when you get the problems in terms of support. You get a different mark of aircraft and this is particularly relevant when you are on operational deployment and you are looking to fit certain pieces of equipment for operations that you will not fit to the rest of the fleet. That can give difficulties in terms of support and maybe training and other areas and lines of development.

Q7 Mr Crausby: We are given to understand, for example, that on training some of our crews have to train on one type of helicopter only to go into operation on a completely different sort. Is that a problem we can resolve?

Mr Whitney: I do not think you can train on a different aircraft from the one you are going to fly in theatre. You can probably train on a variant that is slightly different and does not necessarily have all of the equipment, and there will have to be some training means of catching-up that training. Yes, you could be forced to operate in that manner.

Q8 Mr Crausby: Is there a general acceptance that we have too many types and too many subsets? Would we not be better off with fewer? What sort of improvements could you see with a more coherent fleet? I know it is easier said than done but from our point of view is that the place to be, to have less types, less subsets and a more manageable fleet; or would that deny us some flexibility?

Mr Whitney: I think personally my view would be, yes, that is the place to be. You can get greater economies of scale by having larger fleets. There is a fixed cost associated with operating aircraft. The more aircraft you have, the more you spread that fixed cost across your fleet. Equally, the points you raise about having small fleets, the training burden and the additional cost that that incurs, the problems that that incurs can all be solved by having reduced numbers. You need the budget to be able to make that happen.

Mr Sharples: Could I reply to your question in a different way. You ask: what are the principal problems of having so many fleets inside fleets, and there are two important problems for operating aircraft front line in that regard. One of them is configuration management. It means understanding and controlling what is on your helicopter; knowing what is on your helicopter; and therefore being able to provide the correct parts for that particular sub fleet. Understanding the configuration of the helicopter and controlling the configuration is one of the challenges of multiple fleet operations. A second one, which is closely linked, is obsolescence management. It means ensuring that you are able to manage out of your fleet small batches of obsolescent equipment, and ensure that you are providing from the supply chain replacement parts which are new and current and available in small batches. In the industry one of our key challenges is to manage the supply chain which is often enthusiastic to be involved in high rate production, but not so enthusiastic to be involved in small batch manufacturing for subsequent small fleets in service, particularly when configurations of aircraft change during service. If I could just make a comment as well on your training question; it is true that in our Armed Forces we train our pilots, and therefore our technicians as well, on different helicopters from those that are operated front line. Of course, there is a cost issue there. First of all, we are training ab initio from the beginning, and therefore we want to train our young pilots on simple aircraft in order to acclimatise them to airworthiness and to basic flying.
training; and gradually step-by-step the training system becomes more sophisticated as we move towards the front line, and therefore towards the aircraft that they will eventually operate in theatre. Therefore, my point would be that it would not be cost-effective to use the same aircraft for training, in particular for basic training, as is used front line, because of course these are very expensive and sophisticated weapons systems.

Q9 Chairman: Mr Sharples, would you suggest that it would be a wise way to train pilots to train them in the UK on, for example, analogue cockpits and then to send them out to Afghanistan, so that the first time they are using digital cockpits is when they are in operation against the Taliban?

Mr Sharples: I have some personal experiences as for 25 years I was a Fleet Air Arm helicopter pilot and went through the military flying training programme and operated Sea King front line in theatre. To answer your question, I think it is more cost-effective to train pilots on cockpits and machines which are similar to those that they will eventually operate front line. To answer your direct question, where available, glass cockpit training is available at *ab initio* level these days in simple helicopters; and where we can, we should make available that level of training to our pilots.

Q10 Chairman: “Where we can”: but surely we should be training pilots before they go out to Afghanistan on theatre-entry standard helicopters?

Mr Sharples: Yes, I would have to agree. It is certainly true in other sectors of the aerospace industry and the general aviation sector, a light aircraft sector these days. You can find light aircraft with similar avionics, screens, layouts, and systems in light aircraft similar to very sophisticated Boeing and Airbus aircraft. Yes, you can familiarise and you are introduced into the rotary wing concept on relatively simple aircraft; you move up to more complex aircraft; and you then go through a process of learning to fly a helicopter, and where possible familiarise on systems which are similar to those that you will operate in-theatre. It is clearly cost-effective; it is clearly more efficient training; and it clearly brings to the pilot more familiarisation with the systems that they will ultimately be asked to operate in battle.

Q11 Chairman: But in battle their hand should go instinctively to the right place, so they should know exactly where the levers are without having to think about it. So they should have been doing it for a long time, is that not right?

Mr Sharples: I think the concept of commonality is one which is already prevalent in the aircraft industry; is one which is not so prevalent in the helicopter business; would certainly bring additional advantages to familiarity and therefore reduce training, more reliability, greater flight safety.

Mr Sharp: Chairman, going back to the training question, I do not disagree. Certainly in the US my experience, 10 years on fixed wing with the US Navy and then as a reserve pilot, was that the more commonality you have in training, clearly gives you benefits in the field—no question. I think we have seen a move certainly across the Pond towards similar systems. Certainly the great reliance on simulator training of a glass cockpit gives you that advantage without tearing up airplanes. I would like to go back to an earlier question (because I think it is important to understand) that my colleagues here talked about in terms of configuration control. Configuration control through small subsets is difficult. It is not uncommon to have little problem with that domestically at training bases, potentially here in the UK or in the US. The issue is really accentuated when you have long supply lines to places around the world and it is hard to get the right part to the right airplane at the right time. There is a balance because, as a former commander, I know that you need that right piece of gear at the right time to get the mission accomplished, so there is a balance. You cannot let the pendulum swing all of one side and say, “We’ll only have this one kind”. I would mention, you bring up good points in terms of sets within sets; and really you all set the standard many years ago in the fixed wing community. You had many different types of air vehicles and you came out with the idea of the MRCA and you replaced Phantom and you replaced Lightning and you replaced others, the Buccaneer. The issue at the time, I think I recall, was that people were saying you were going to introduce a new type so we should not do it; but at the end of the day, you introduced a new type and you in fact retired three other types. It is not the actual type, of course, it is the cost savings. It is that long logistical tail, a 7:1 ratio that you are getting rid of. If you had more of a multi-role face, where you could take a single helicopter and mould it into a multi-role helicopter, then I think you are probably going in the right direction.

Chairman: That is extremely helpful. We are just about to get onto that series of questions now. Mike Hancock?

Q12 Mr Hancock: Can I just go back to the question about training and pilots being trained, say, on Apaches here which have one type of configuration and then they go to theatre and they are flying a different type. Is it as easy as what you have said, Mr Sharples, to switch from one style of training to actually flying in combat?

Mr Sharples: I am afraid I do not have experience of flying the Apache. I have flown multiple types of Sea King. The difference training can be relatively minor, but it really depends on how much difference there is in terms of systems management and systems on the training machine compared to the weapon.

Q13 Mr Hancock: For how long on a relatively new aircraft like the Apache can it be possible to have that sort of variant?

Mr Whitney: I think it is important to understand there is a process of learning to fly a helicopter, and you start at the defence helicopter flying school and you are introduced into the rotary wing concept on relatively simple aircraft; you move up to more complex aircraft; and you then go through a progress where you convert to role, and convert to type. Converting to type is a training that you go through to learn to fly, let us say, a Lynx or an Apache; and this is taking you from a basic
helicopter where you have done single engine and
twin engine, and you go into a specific training phase
to learn to fly the Apache. You then go conversion
to role, which is teaching you to fight the Apache, or
to use the aircraft in its true combat environment.
This is not a week’s training; it is many weeks of
training. So pilots will not go into theatre and get
into an aircraft and not know what to expect. I think
that is a false illusion if that is being taken by the
Committee. There are procedures that they have to
go through. I think the point you do get is, with these
small fleets within fleets where you might be
modifying aircraft for the battlefield environment
quickly but through the urgent operational
procedures, you could end up where there is some
additional training or some equipment that is fitted
to those aircraft that is not “not understood” but
might be not on the training aircraft and you will
have to find alternative means of training—whether
that be simulation, textbook etc.

Q14 Mr Hancock: Can I ask then about the
Through-Life Commitment that you have to service
these aircraft, and where the delays occur. If you take
on the responsibility to provide through-life
maintenance for a particular helicopter, why are
there such long delays in getting parts for these
helicopters when you have signed up to give the
service which you said you would at the initial
stages?

Mr Sharples: I would like to think with the Through-
Life Support Contract that we have recently signed
there will be less delays in future than there have
been in the past prior to signing the contract. I think
one of the advantages that the OEM brings to the
operator with through-life contracts is that we are
able to bring our full resources of logistics,
maintenance and technical support to the operators,
where the operators have not necessarily had access
to previously. In Eurocopter we have in the region of
€500 million of inventory located in stock logistic
centres around the world. One of the core
competences necessary to manage the spares supply
chain is the ability to anticipate and forecast what
will be needed in terms of spares for maintenance.
That may sound simple but it is not, for the simple
reason that most spares required for helicopters are
in fact very rarely called up from the inventories. It
is quite common for 80% of all spares to be on stock
for more than three years and never called. So you
have a very small number of high rotating parts, and
a very large percentage of slow movers. Therefore,
one of the key competences is to predict which parts
will be required and which parts are to be therefore
stored in an inventory. Through the OEMs, the
Armed Forces have access to a core competence
which is logistics forecasting.

Q15 Chairman: We will have to move away from
Ministry of Defence abbreviations here.

Mr Sharples: The manufacturing supply chain. One
of the things that the manufacturing supply chain is
most capable of doing is managing the supply chain.
We have more than 2,500 suppliers in Eurocopter
and one of our key tasks is to manage that supply
chain so that they can deliver on time to our
facilities. You ask: why are there difficulties? The
simple answer is: it is a great challenge to manage the
supply chain from anticipation, through to
procurement, inventory and eventually delivery of
parts to a diverse fleet in service in often very remote
geographical locations.

Q16 Mr Hancock: That is what you have signed up
to do, is it not?

Mr Sharples: Yes, we have, and we have signed up
to deliver according to KPIs with the MoD in terms of
performance.

Q17 Mr Hancock: So why is there so much
cannibalisation going on? If 80% of the spare parts
stay on the shelf for up to three years you will have
worked out by now that the 20% is the critical area,
would you not? Why is it that helicopters are
regularly cannibalised and some of them never fly
again, because that 20% is not forthcoming?

Mr Pitchforth: I would like to talk about our TLCS
programme.

Q18 Mr Hancock: I would like you to answer that
question, first, about why it is that the parts are not
available and so much cannibalisation goes on?

Mr Pitchforth: I do not recognise the hypothesis you
are making, because under TLCS we are delivering
more aircraft than contracted. We are contracted to
produce 27 aircraft and currently today we have
produced 29 aircraft, so that is above our target. For
those items that are in scope we have very, very low
levels of cannibalisation. We do not allow
cannibalisation on our depth line, unless it is for an
aircraft state in theatre which requires that to be
removed and taken to theatre urgently. Under TLCS
I do not recognise the cannibalisation statement
and/or the long lead time. We are producing aircraft
above the contracted and targeted level; and for the
items in scope we are above our KPIs on component
production to theatre also. I would be interested to
understand this specific area.

Mr Hancock: You do not think that helicopters are
regularly cannibalised to provide spare parts for
operational aircraft?

Q19 Chairman: Or not Chinooks anyway!

Mr Pitchforth: The only time a Chinoook would be
cannibalised is if there was a state in theatre where
it needed a component that was not available in the
supply chain; otherwise we resist that as much as
we can.

Mr Whitney: I have to take the question. We have
two support schemes in place: one supporting the
Sea King, which we call SKIOS; and one supporting
the Merlin which is called IMOS. These are long-
term support contracts with longer pricing periods
so we can see a long-term throughput, and that
enables us to work with the supply chain; indeed
partner with the supply chain; partner with the
Ministry of Defence. Your direct question about
cannibalisation, yes, it happens; it is happening
today on Merlin; it is happening on Apache. I think
the simple answer why is that there are insufficient
spares that have been procured in first instance. We are operating aircraft in theatres that are more challenging than the assumptions that were taken. If you certainly take the case of Apache, it is fielded in theatre many years ahead of that which was planned. Inevitably you work on the basis that you are going to have an increasing training and flying burden, and you plan your spares procurement around that accordingly. In the instance of Apache you ramp that up, as a result of the conflicts that we are currently in, significantly above that which was planned.

Q20 Mr Hancock: Is there insufficient resources going in then from the MoD to ensure that spare parts are available for this number of aircraft to be regularly in combat?

Mr Whitney: I think it is difficult to state precisely whether there is insufficient. There are challenges in terms of—

Q21 Mr Hancock: Where is the problem then? We put these operational aircraft in doing more than they were originally meant to do and far sooner, but we did not supply enough resources to make sure that they were always able to fly—very fast turnaround over maintenance issues. Who is responsible?

Mr Whitney: It is not just spares; you have to look at all of the lines of development. Your training infrastructure has to be capable of producing pilots; your training infrastructure has to be capable of producing the technicians and maintainers. It is not just about spares supply.

Q22 Mr Hancock: It is no good having well-trained pilots and crews, if you have not got Merlin gearboxes, is it?

Mr Whitney: No absolutely. It is no good having aircraft either if you have not got the pilots; the whole lot has to come together to give the effect.

Q23 Mr Hancock: How do we get over something like the ongoing failures of Merlin gearboxes?

Mr Whitney: In cases of ongoing failures—and I do not recognise “ongoing failures of Merlin gearboxes”, but we have got some specific instances—

Mr Hancock: When you say you “do not recognise” it, would you say there is not a disproportionate number of gearboxes on the Merlins that fail?

Q24 Chairman: Let us allow Mr Whitney to answer that question.

Mr Whitney: I think what I was going to go back to was the method of contracting now in a long-term support arrangement—we call then the IOS; the Integrated Operational Support arrangements—inciters the industry to put these issues right, to buy the correct number of spares. Derek was absolutely right: the challenge is to understand your spares requirements and get the spares on the shelf; clearly not to carry too much inventory—there is a cost and it is driven as a result of that—but to carry enough; to have those spares at the right level of assembly.

With the new contracting methods, there is incentivisation on the industry to improve the product through-life. Previously that has not happened, and I think that is where there should be confidence that things are improving and getting better. You will always have instances on helicopters where a certain failure that has not been predicted will cause an issue, and we have to work our way round it. These long-term support contracts equally allow that to happen with much greater urgency and much greater effect.

Mr Hancock: Why is there then a substantially higher failure of the Merlin gearboxes?

Q25 Chairman: Would you recognise that there was a substantially higher failure of Merlin gearboxes?

Mr Whitney: In comparison to what?

Q26 Mr Hancock: Other aircraft?

Mr Whitney: I would have to go and examine the figures for that, and I am not in a position to quote.

Q27 Mr Hancock: We suggest to you there is, but you would not think that? That does not strike you as something you are familiar with?

Mr Whitney: I am familiar with the fact that the gearbox on the Merlin has had some issues in the past in terms of lifing of components. When you develop an aircraft and you develop new components you start off with the life of a component and you test it and you increase that through-life. That has not taken place in the manner that perhaps we predicted, and that may be a problem to which you refer. Components are being changed—not through failure but through the need to change components on life. In maintaining airworthiness on a helicopter you sometimes give components lives and you change them before those lives expire—that is how you maintain safety. That is something I could recognise, but I would need to come back to you with the exact details of that if you require.¹

Q28 Chairman: If you could do that would be helpful. Mr Sharples wants to broaden it.

Mr Sharples: Chairman, a general comment if I may to try to throw some light on the question. Cannibalisation is more often a problem with new helicopters entering into service than it is with those that have been in service for a number of years. The reason for that is because new aircraft that enter into service than it is with those that have been in service for a number of years. The reason for that is because new aircraft that enter into service have a substantially higher failure of Merlin gearboxes? Why is there then a substantially higher failure of the Merlin gearboxes?

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Mr Sharples: Chairman, a general comment if I may to try to throw some light on the question. Cannibalisation is more often a problem with new helicopters entering into service than it is with those that have been in service for a number of years. The reason for that is because new aircraft that enter into service lack fleet experience; they lack flying hours; they often are subject to unscheduled maintenance, unpredicted maintenance, which was not considered during the design phase. They often have heavy schedule maintenance programmes which are lightened as the years go by through experience; and they can also be subject to lack of technical expertise—just insufficient time in service for the technical expertise to be built. We often find that cannibalisation is more prevalent on new fleets in service than it is on old ones. I am happy to say that on the Puma fleet in the RAF, cannibalisation is not

¹ Ev 77
a major issue for us, because after so many years in service and more than 70 million flying hours, the Puma is a very reliable helicopter and now has had a fully mature service experience.

Mr Hancock: Can I just ask two quick final questions. One is: I would like to know what any of you would feel can be done to improve the system, speed up the system so that the downtime on aircraft is cut; and my final question goes back to the Apache issue. The real difference here, the crux of the matter, is about this training on one type and then flying another. It is the difference between the theatre entry standard of Apache helicopters and those that are in the depth fleet; and there is a substantial difference, is there not? That must create a problem, either where they are in operational flying or in the training that pilots get to fly those aircraft. If there is a substantial difference between the two, there must be an issue there that ought to be addressed, surely?

Q29 Chairman: Would you like to deal with that second question first and then come back at the end to what can be done to improve things?

Mr Whitney: I will take the Apache aircraft question. I do not think the difference is substantial. Yes, there are differences in terms of some of the modifications associated around defensive aids kit and fuel tanks etc., but I do not think this is a huge burden in terms of that to which you allude. Perhaps industry is not the best judge of that; I think the military would be a much better point at which to make that question.

Mr Sharp: Certainly I do not have the experience that you all do with the British military and how many types. I was just listening to the number of types involved and I think if you are looking for ways to increase efficiency we come back to the same point that was made before, which is: in a multi-role helicopter, if you have something that can do more than one thing, and you have many more of them, then the supply chain that will support those is going to support across a broader array. If you have one that can be used for utility, but can also be used for Medevac, but can also be used for lifting a 105 mm Howitzer and ammo then there are more of that same type, then you are driving towards having a logistics footprint that supports that one multi-role asset versus many separate types that may, through long lines of logistics, be difficult to support. I used the MRCA example previously; the US Navy followed your example and replaced some time ago all the F-4s, A-7s and A-6s with an F-18. Now on our carrier deck an F-18 is a fighter; it is an attack jet; it is an electronic warfare airplane; it is now used as a tanker and you have one basic airplane. Yes, there are some different types but the MFDs, the multifunction displays, are the same; the stick and throttles are all in the same place; the engines are the same. So you have, again, a multi-role attack at this logistics problem; and now we have downsized the logistical footprint on the aircraft carrier to support really one basic type.

Chairman: I think we would all like many, many more in the American way, Mr Sharp!

Q30 Mr Jenkin: On this question of supply of spare parts, how do OEMs give confidence to the MoD that battle-critical parts get priority over any other demands from any other of your civilian customers who may be more commercially valuable to you?

Mr Pitchforth: From a Boeing perspective the UK Chinook fleet of spare parts is purely the UK Chinook fleet of spare parts. There is no cross-fertilisation with any other fleet, military or civilian. It is completely bespoke through TLCs, for the UK Chinook aircraft.

Q31 Mr Jenkin: But that would not be true for the Merlin, would it?

Mr Whitney: Absolutely, yes, they are military bespoke aircraft. In fact, it goes one step further in terms of the long-term support contracts because we have a joint team. The team is sat together, either at Yeovil or Sherborne, and that is a joint industry/MoD team.

Q32 Mr Jenkin: Supposing there is a shortage of widgets on rotors, whatever it may be, and that part is sourced from some other part of the world, or another part of your Finmeccanica operation: how do you give confidence to the MoD that, when that part is needed for a helicopter—

Mr Whitney: They are party to the dialogue that goes on. They actually see the requests being made. We have joint sessions with the companies concerned where we sit just like this; we have a meeting where the MoD are actually sat alongside us. It is not like we can hide behind anything.

Q33 Mr Jenkin: The military get the priority?

Mr Whitney: Absolutely. In terms of war fighting, I do not think there is any question that, when it comes to UORs or support to the front line, industry absolutely understand the urgency and need that is upon us and we stand up to deliver.

Q34 Mr Hamilton: Could I just take that one stage further and that is about the upgrades that continually take place. I come from a background where I worked in heavy industry for 20-odd years, in the coalmine industry, and it was quite regular to upgrade as we went through heavy machinery. One of the things that comes through is, when we started to put heavy engines into machines which could not take it, we began to see the splits taking place in the casts, and the splits taking place in a number of other ways. My question is: what are the risks associated with putting a powerful engine into an old frame?

Mr Sharp: Certainly in the US we have experienced a number of issues, and then there are workarounds to try to address those issues—the latest of which was the E-2 Hawkeye put advanced triple broad engines with new propellers on the front of them; and we had a lot of excessive vibration in the back and fretting in the back end of the airplane. Those tend to be unintended consequences of improvements to the system. My experience in the military, part of which was looking at the overhaul of fighters coming in over 55–60 months in San Diego, we had a contract with the military where we
did a standard statement of work to overhaul that, ship it out, take the wings off, engines out, and get it back to the fleet all bright and shiny. Although that is a neat idea, each and every single airplane that comes through, although on the outside they look the same, when you take the turtletreks off and you get on the inside, what has happened to each one of the airplanes or helicopters, wherever it was, is different; so the statement of work automatically mushrooms into: does this keel beam need to be replaced; does the engine need to be replaced? The cost savings of doing everything the same way off an assembly line and upgrading it is very, very difficult to quantify upfront until you actually get into the project; and once you are into the project you need a lot more money to finish it.

Q35 Chairman: Mr Whitney, I think the Apache helicopter, which had a Rolls-Royce engine put into it for the British buy, seems to have worked pretty well with that Rolls-Royce engine?
Mr Whitney: Indeed it has. The Rolls-Royce RTM engine is performing extremely well. It is higher powered than the American engine that was fitted, and is demonstrating that capability in theatre. However, I think the Apache was designed from day one as a crashworthy aircraft. I think the issues that you raise in terms of putting more powerful engines into older aircraft can work. You can get greater performance from an aircraft, but you have to then go back to the basic structure air crashworthiness. Certainly if we are looking at a modern aircraft, it is designed to different standards to an old aircraft, and that is where you suffer the potential downsides of just increasing the power.

Q36 Mr Hamilton: Are you saying that modern aircraft are different in the sense they are sleeker than what the old aircraft were?
Mr Whitney: No, the other way around. What I am saying is that a modern aircraft will be designed around the concept of having a crashworthy undercarriage that can take descent velocities much greater than older aircraft; they will have attenuating seats that take impact and allow much greater survival rates. I would not want to guess but if I looked at a 40% crash case—and when you design for a crash case there are some distinct criteria that you have to take into account; there are lots of analyses done of lots of previous crashes—the data that we design around an old aircraft would typically be a 40% survival rate against that crash case; a more modern aircraft would be circa 80%; and if I look at the future Lynx today, and the future Lynx is a good point, the old Lynx is probably a 50% aircraft; and the new future Lynx, which is a new structure, much greater descent velocity, it would be a 95% aircraft. It just gives you some analysis in terms of where you can get with modern design.
Mr Hancock: The judgment for when an aircraft can be upgraded is a pretty fine one, is it not? Those judgments have to be pretty well analysed, do they not? You cannot just say, “We’re going to upgrade a Puma”, for example, without knowing the real consequences of that. Where are those judgments made? Are they made by industry or are they made by the MoD relating to the cost of either developing a new aircraft or taking a chance on upgrading?
Chairman: I think we ought to move on because we are running out of time and I want to cover a lot more ground.
Q37 Mr Jenkin: We are using our helicopters very much more intensively than we expected in battlefield conditions and very harsh environments. What effect do you think this has on their lifespan?
Mr Pitchforth: Some of that depends upon whether the airframe is lifed. In the case of the Chinook if it is not we can continue to repair and maintain that aircraft throughout its life. There is an advantage also of being a member of a very large fleet. The learning on the Chinook fleet is quite extensive through the thousands of aircraft in service; so therefore many of the issues that we may see with the extra usage we can predict and/or inspect for, understanding when those issues are going to arise. The Chinook fleet is a well understood fleet with a large sample and statistically therefore we understand what is going to happen to the airframe, because these are not pressurised aircraft; they do not have the high stress issues that a pressurised fuselage does, so therefore their life is considerably greater than a pressurised aircraft.
Mr Sharples: Just a word on the Puma fleet, if I may. I think it is fair to say that in comparison to the civilian Puma fleet, the military Puma rate of flying is not as intensive as some of the fleet leaders on the Puma fleet. Offshore, for example in the very extreme conditions in which Puma fleets are operating in the civilian world also, either in Alaska, in the Middle East, in parts of South-East Asia or, indeed, in the North Sea, to give an example, fleet leader in the civilian Puma fleet currently has more than 38,000 flying hours on the airframe. Although I cannot tell you what the fleet leader in the RAF Puma fleet is, I am quite sure it is only a fraction of that. That is to say, despite the intense use to which we put our machines in military theatre—and again I have personal experience of doing that—nevertheless these machines are built for very intensive operations; and I do not think today we are in danger of running out of the lifetime of these machines.
Q38 Mr Jenkin: Of course, some modern airframes are lifed. Is this just the equivalent of food manufacturers putting early sell-by dates on their processed foods, so the housewife has to throw them away?
Mr Whitney: In terms of the products that AgustaWestland support, I do not think it is. The impact on operating in an extremely harsh environment may be that some components require replacement sooner than anticipated; and in a long-term support arrangement, like IMOS, that is costing us, industry, money. The aircraft are designed to work within a flight envelope, within an environment; and, indeed, the theatre they are in is a challenging environment but it is one that they are tested and designed to operate in.
Q39 Mr Jenkin: What is the airframe life of a Merlin?

Mr Whitney: 10,000 hours.

Q40 Mr Jenkin: We have just heard these Pumas are doing 35,000.

Mr Whitney: It is only limited to 10,000 by the requirement that was set in the early days. We have actually done studies that are ongoing right now with the Ministry of Defence, and the aircraft is capable of being extended to 15,000 hours.

Q41 Mr Jenkin: That is still half of 30,000 hours. It does not sound such good value for money?

Mr Whitney: You are not flying anything like that rate in the military. In a civil environment you are flying much, much more.

Q42 Robert Key: How do you decide when extending the out-of-service date introduces unacceptable risk? How do you decide in engineering terms, or is it not an engineering decision? It is a statistical decision, or a legal decision. How do you decide?

Mr Whitney: I do not think that is an industry decision. Industry will have a requirement to upgrade an aircraft and we will upgrade that to within the design specification that is laid upon us. That may or may not prove possible. If you require full crashworthiness on an old aircraft that may not be possible because physically the structure is incapable of being upgraded to that point.

Q43 Robert Key: Have I got it right, you have said it is not the manufacturer’s responsibility to make the judgment about the risk of extending the life of a helicopter?

Mr Whitney: Clearly there is an absolute judgment to be made, but there is a specification that will be laid upon the manufacturer that we will be complying with.

Q44 Robert Key: Who makes that specification?

Mr Sharples: In fact it is the responsibility of the design authority for the helicopter. In the case of Eurocopter, we are the design authority for the design of our own helicopters. To answer your question directly: it is the responsibility of our engineering team to make the statistical analysis on failure rate. To give you a number, if I may: the commercial certification requirements oblige the design of passenger-carrying machines—be they helicopters or airplanes—not to fail within 1 x 10^6 flying hours. There is a statistical obligation on the designers to ensure that aircraft will not fail; and, therefore, the designers build in redundancy either to the airframe or to the systems to ensure that that failure rate in all circumstances be it original design or upgrade is maintained. In our case, for the Puma upgrade our engineering team has calculated, as you would call it, the “consequences” of the upgrade programme. We have worked jointly hand-in-hand with the MoD, and it is a joint decision in this case—it will be a joint decision between industry and the MoD—to upgrade the programme based on upgrade experience that we already have, for example, in the Puma fleet in Portugal, and in the military fleets in the Middle East, which have already been upgraded.

Q45 Robert Key: The Ministry of Defence is going to spend £235 million, is it, on upgrading the 43 Pumas, when we know that the Puma is not crashworthy and is therefore not fit for purpose. Is that not true?

Mr Sharples: I would not comment on whether or not—

Q46 Robert Key: Why will you not comment?

Mr Sharples: I will comment on the question of the life extension programme, Mr Key. The objective I think of an extension programme is to improve the performance, the availability, the reliability, the easiness of operation of the helicopter and, therefore, the safety of that helicopter as well. The life extension programme of the Puma fleet will see the aircraft re-engined; new avionics systems; new digital autopilot; it will see new engine control systems; new tail rotor blades; a strengthened tail. All of those enhancements will ensure that that helicopter is more reliable, easier to operate and more available for the next 10 years than it has been in the past.

Q47 Robert Key: None of which has anything to do with its crashworthiness?

Mr Sharples: I think it does, if I may. I think strengthening the tail; I think providing greater power margin; I think ensuring that engine control system is simpler and easier to operate for the pilots; yes, I think that does improve crashworthiness.

Q48 Chairman: Could you explain that, please? Can you talk us through why engine control improves crashworthiness?

Mr Sharples: Automatic engine control allows the engines to respond more quickly when power is called for by the pilot. Therefore, in a situation where the pilot may find himself and his crew operating in marginal conditions, for example in hot and high conditions in mountains or in very severe weather conditions, his ability to call and expect to receive additional power at critical moments makes the aircraft a safer, more reliable machine.

Q49 Robert Key: Will the recent High Court judgment about the Human Rights Act aspect of this make any difference to your decision-making when it comes to the extension of aircraft life, knowing that you are going to be responsible for sending military personnel into theatre in an aircraft that you must know is not crashworthy?

Mr Sharples: Once again, the Puma is a very crashworthy aircraft and will be more so—

Q50 Robert Key: I am sorry, did I hear that right: it “is a very crashworthy aircraft?”

Mr Sharples: I did say that. The Puma is designed according to the design standards required by both the civil aviation authorities and the military aviation authorities.
Q51 Robert Key: What percentage figure is it in terms of the crashworthiness scale?
Mr Sharples: I am sorry, I do not have the figure.

Q52 Robert Key: Someone trotted out some statistics a few minutes ago about, “This helicopter is 50%, that one is 90%”. What about the Puma?
Mr Sharples: Do you mean in terms of its accident rate, for example? Yes, I can give you a statistic on that. Offshore in the civilian world the fatal accident rate of the Super Puma is currently running at less than 0.5 fatal accidents/100,000 flying hours—that is half the average for offshore oil and gas helicopters in general.

Q53 Chairman: Is that the most dangerous aspect of flying that the Pumas do?
Mr Sharples: I am not sure I can answer that question, Chairman. You could make a judgment yourself on how dangerous offshore oil and gas operations are. They are certainly very challenging; certainly a very difficult and demanding environment.

Robert Key: If the Ministry of Defence decided not to spend £235 million upgrading these non-crashworthy aircraft, what would be available instead?
Chairman: I want to say the witness has said that he considers that the Puma is crashworthy, so I do not want you to ask the question in a way that denies the witness’s answer.

Q54 Robert Key: I have my opinion, Chairman, but of course I accept your advice. What alternative is available to the Ministry of Defence to purchase or to upgrade, if they decided that they were not prepared to take the risk of flying with Puma?
Mr Sharples: Once again, the risk associated with the upgrade is a shared risk both between industry and the Ministry of Defence. The design authority for the Puma is industry and, therefore, it is our responsibility to ensure the integrity of the design.

Q55 Robert Key: So this is going to be a question for the Ministry of Defence, for Ministers, I guess, in the end, because they are going to have to make the judgment. Could I just ask about the Sea King Sikorsky, and the fact that here we have a wonderful aircraft, in which we flew quite recently, but it is 40 years old, and there is a proposal to extend the life by a further four years for the Mk7s and another six years for the Mk4s. There were cracks in the mainframe 10 years ago; there are cracks in the mainframe now. How realistic is it to keep this wonderful old antique flying on operational duties?
After all, it is now going to go to Afghanistan with Carson blades and that is wonderful but is it worth the risk?
Mr Sharp: I defer to my colleague from AgustaWestland. From a Sikorsky point of view, clearly we have looked at it in the commercial—our business is both commercial and military. We have moved on in the commercial world and developed the S-92, which we have put out into the fleet—there are over 100 of them out there now; the ones in the North Sea flying at 185-190 hours/month; there are four of them that are now deployed with your UK Maritime and Coastguard Agency in pretty challenging conditions up on Sumburgh and Stornoway and doing some pretty great things. I cannot comment on whether that upgrade is the right thing or not really. That judgment is going to come through MoD; it is going to come through combatant commanders with the operational requests that are going to go to the requirements officers in Whitehall, and they are going to go and find out what the best piece of kit is that you want to put out on the front line. There are obviously other alternatives in the market today that you could purchase.

Q56 Chairman: Mr Whitney, do you need to add anything on that?
Mr Whitney: No, not on Sea King. I think the same arguments apply. It is an old aircraft but you can upgrade it, and it is operating in Afghanistan as we speak. In terms of the direct question about what alternatives—I think the alternatives are in line with the early questioning about reducing the fleet numbers and potentially buying more of what you have got.

Q57 Mrs Moon: The Royal Aeronautical Society has expressed a concern that the Ministry of Defence’s industrial strategy could have an erosion of the UK’s rotorcraft defence technological and industrial base. Would you agree with that? Does the strategy provide an adequate basis for your relationship with the MoD?
Mr Pitchforth: The Defence Industrial Strategy is the reason I am sat here today from Boeing. It requested that Boeing put down more of an in-country presence with engineering capability and what was described as a “footprint”, to give the MoD the ability to interact with a company in an easier manner. We are doing that and we embraced the Defence Industrial Strategy as a good thing, which gave clarity to industry; and we have invested because of it and we would actually like to see that strategy reinvigorated and picked up and moved forward again so we can continue to use it as a roadmap to how we should be engaging with the Ministry of Defence.
Mr Whitney: If I take the AgustaWestland answer, we fully supported the Defence Industrial Strategy; indeed, we signed a strategic partnering arrangement with the Ministry of Defence in June 2006 and have seen real benefit from that in terms of the way in which we work together and plan together; and look to manage some of the problems that there are in terms of managing the helicopter fleet with a small budget, shall we say. I think the more that can be done in terms of partnering and strategic partnering under the guise of the Defence Industrial Strategy the better.
Mr Sharp: If I could just address that from a Sikorsky point of view. I think less of a focus for us—certainly we are not part of your Defence Industrial Strategy per se—but we certainly from a corporate standpoint, would look at partnering as so
important across all of our different military and customer bases. From a military standpoint on the support side, we have partnering agreements in Columbia; we have got manufacturing partnerships in Turkey; we have got manufacturing partnerships in the Czech Republic as well as in Poland. I think partnering is clearly a way forward. We are surely not going to try to bake the birthday cake, put the icing on and deliver candles all from the United States to anywhere; but partnering with somebody in-country to deliver high quality, high dispatch reliability products is clearly the way forward.

**Mrs Moon:** Does the Strategy place sufficient emphasis on competition?

**Q58 Chairman:** That is the other side of the question. **Mr Sharples:** Eurocopter has taken the decision to invest in the UK to support the current fleet in service, but also to exploit the opportunities that the Defence Industrial Strategy brings for us; but, to do so, competition is absolutely critical. The market must be open to us to allow us to compete against the incumbent manufacturers. By doing so, I genuinely believe that Her Majesty’s Government and the Ministry of Defence will obtain the benefits of technology investment, transfer of intellectual property, generation of employment, investment in new skills, overall best value for money. The more that the Defence Industrial Strategy opens the market and concentrates on competition, the better I think it will be for the Ministry of Defence, for the Armed Forces and for the UK taxpayer.

**Q59 Mrs Moon:** Does that imply that you do not think it has opened up to competition enough yet?

**Mr Sharples:** I think we would be happy to be invited to have every opportunity to bid whenever those opportunities are available.

**Mr Pitchforth:** The first version of the Defence Industrial Strategy focussed mainly on maintaining and preserving the skills in-country and/or growing those skills as we have done with Boeing. We have done that with our partners at Vector Aerospace in Fleetland in our depth line, increased the knowledge, capability and skills in-country. I think there is another version of the Strategy which is imminent, I guess, and we would be interested to know what that says about some of these other points that would need addressing.

**Q60 Chairman:** You would like to see a second version of the Defence Industrial Strategy soon, would you?

**Mr Pitchforth:** It has always been our understanding that that has been on the cards.

**Mr Sharp:** To follow my colleague from Eurocopter’s comments, of course we are always happy to bid or be involved in anything that we can be. The real question—in terms of “is competition working for you?”—is probably better answered by asking the question not to us as industry colleagues but more to the MoD; and that is to the brave men and women that fight for your country. Do they think they have the best products on site in Afghanistan and Iraq? If they think they are operating the best equipment that is going to give them the greatest advantage while they are in harm’s way then your strategy is working; and if they do not then you do not.

**Mrs Moon:** I can assure you this Committee does ask that question on a regular basis.

**Q61 Mr Crausby:** Can you tell us something about Integrated Operational Support—how is it working in comparison with the more traditional support systems?

**Mr Whitney:** The Integrated Operational Support models that I referred to earlier on, IMOS for Merlin and SKIOS for Sea King, are working very well. We have a partnership so we have taken on board the supply base; they are part of our team. We have taken on board the MoD and work in a totally joined-up manner in delivering the support necessary to keep those aircraft on the front line. I think it is worth also pointing out to demonstrate the value-for-money case to meet Treasury approval we had to demonstrate the fact that we could do this even more efficiently than the previous regime. In terms of the Sea King business case, I think the figure was 10% cheaper; the Merlin was nearer 20%. That is what is being delivered today. The transfer of risk to industry I think allows the Ministry of Defence to walk away from those risks; industry can manage it. As I said previously, the incentivisation is now with us to improve the product through-life and maintain it through-life. By having a long-term partnered arrangement, looking forward, with a five-year pricing period allows us to work with the supply base and plan accordingly; rather than perhaps in the past where orders would have been sporadic—every three or four years a spike of orders; business cannot plan on that basis. Business needs predictability; and the Ministry of Defence obviously needs flexibility and it is a balance. I think the IOS arrangements allow us to strike the right balance with improved value for money.

**Mr Pitchforth:** Our version of the Integrated Operational Support scheme is TLCS for the Chinook. When we took that on three years ago we contracted for 12,000 flying hours of Chinook. The RAF had never achieved 12,000 hours at the point when we took over the contract. We are now heading towards 16,000 hours with a target of going even higher than that in the future. To answer your question: we are delivering capability in theatre today as we speak from the Chinook fleet at a lower cost than we were doing previously. I regard that as a success.

**Q62 Mr Crausby:** How does that work from a safety point of view? I understand there is a transfer of financial risk, but is there a transfer of personal risk to industry from the MoD?

In the sense that the MoD have a responsibility to ensure that our service personnel are unbelievably safe, and sometimes a reduction in cost can have an effect on that. How can we be assured that the transfer of financial risk to industry maintains the standards of safety?
Mr Whitney: There is no change in the airworthiness approvals process as a result of this. The underwriting of the aircraft safety primarily is down to the Ministry of Defence being happy with the evidence that is given to them, and that does not change. I do not think airworthiness changes in any way. There is no way that we, industry, could for instance fit a part to an aircraft that was not of the right standard. I think that is what you are potentially suggesting could happen; that would not happen in this instance.

Q63 Mrs Moon: Could I just talk to you about the system of Integrated Operational Support and how that is working. I wanted to find out whether, in fact, in terms of support on aircraft and their maintenance and their actual operation in theatre and preparation for deployment, do you think there is a greater role for industry; is there a possibility of you extending your role in making sure that craft are available and are actually serviced and ready for deployment? Is that something you feel is an area you can expand further into?

Mr Sharp: I cannot comment on SKIOS or IMOS—those are not our programmes. I would tell you that I think in the commercial world, certainly our commercial business, we have tried to employ new technology, latest technology, we call it HUMS but it is an integrated HUM system—Helicopter Usage Monitoring System—which monitors wear, monitors vibrations and so on and so forth. Rather than a reactive maintenance—where the airplane comes in, the pilot reports it broken and we go to maintenance and we ask for the right part to fix the airplane and get it back up—what HUMS allows you to do, certainly in businesses in offshore oil where you are trying to make money on thin margins at high operational tempos, is that it allows you to predict a bearing starting to go bad and then re-ordering it, selecting it and doing that maintenance, rather than waiting for the thing to break. We have talked to our military, our government about that and that is going to be going on; the next generation Black Hawk is a full up HUMS system that the military will be able to take advantage of that same technology in terms of more predictive maintenance rather than reactive maintenance.

Mr Pitchforth: We are actually doing that already; we are moving forward with our Vector colleagues to support the Chinook fleet forward at RAF Odiham and also into Afghanistan; and that is to take the knowledge and skills that we have established in Fleetlands in changing the depth facility and learning through our lean process and moving that knowledge out, first of all to the UK operating base at Odiham and then further forward even to theatre. Today in theatre we have a team led by Boeing with Vector technicians helping the RAF today on the ramp as the aircraft take off at theatre. So we like to see the learning from that and we do not know if that is a short learning exercise that we will need to repeat periodically or whether that is a constant involvement that we are taking the first steps into helping in the way that you have described.

Chairman: Can I say thank you very much indeed to all of you for your helpful information, which is the first part of our evidence session today.

Witnesses: Mr Paul O’Hara, Vice President, Customer Relations (Defence Aerospace), Rolls-Royce, Dr Beatrice Nicholas, Director, Surveillance and Protection Technologies, SELEX Galileo and Mr Declan O’Shea, Chief Executive, Vector Aerospace Corporation, gave evidence.

Q64 Chairman: May I welcome our three new witnesses. May I repeat that you do not need to answer every question, and actually you have heard all these questions answered anyway so you need only add to anything you think you would like to add because we are going to be going through the same sorts of questions and we do not need to do it at huge length. But I would like to say thank you very much indeed for coming. Mr O’Shea, would you like to begin by introducing yourself and saying what your company does?

Mr O’Shea: Certainly; thank you, Mr Chairman. My name is Declan O’Shea and I am the President and Chief Executive of Vector Aerospace. Vector Aerospace is a company based in Canada; we have operations in the UK, Canada and in the United States. We perform maintenance, repair and overhaul on helicopters, helicopter engines and on fixed wing engines.

Q65 Chairman: Thank you very much. Dr Nicholas. Dr Nicholas: My name is Beatrice Nicholas; I work for SELEX Galileo, which is part of the Finmeccanica Group. I am the Director of the Surveillance and Protection Technology area within the electronic warfare business there and we provide electronic warfare equipment to wide range of helicopter platforms for the UK.

Q66 Chairman: Thank you. Mr O’Hara.

Mr O’Hara: A very good morning to you. My name is Paul O’Hara; I am the Rolls-Royce Vice President to Customer Relations. I am representing Rolls-Royce, which has one of the broadest portfolios of aerospace products in the world. I am actually employed out of Bristol, which is where the Defence Aerospace business is actually based. Personally, I am based at AgustaWestland in Somerset.

Q67 Chairman: Thank you. In relation to helicopters what do your companies do? Mr O’Hara.

Mr O’Hara: Rolls-Royce is proud to be associated with the defence business. We are working on a number of products which you have already described this morning. On the Lynx helicopter, we have the Rolls-Royce Gem engine; in addition to that we are actively supporting the UOR to replace the Gem engines with the LH TECT800. On the Sea...
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King helicopter we have the Gnome engine which, as we have heard again this morning, is deployed in various locations around the world. RTM322, again a partner engine but it is on a number of Merlin applications, of which there are at least three; and the Apache helicopter. There are other products that we are associated with but they are not necessarily in the UK portfolio; but I think that covers the majority.

Dr Nicholas: We make a wide range of electronic warfare equipment, which is fitted to helicopters that are in service with all three of the services. For instance, we have the HIDAS equipment, which is fitted to the UK Apache and will also go on to the future Lynx known as the Wildcat with AgustaWestland. We made the Sky Guardian 200 Radar Warning Receiver, which has been on a wide range of platforms for a number of years; and the Sky Guardian 2000 Radar Warning Receiver which is on the Sea King and Merlin Mk 3. Through other parts of the company—not the part with which I am directly associated—we also make radar and other equipment which is fitted on various parts of the helicopter fleet.

Q68 Chairman: Do you make glass cockpits?
Dr Nicholas: We do not, no.

Q69 Chairman: Mr O’Shea?
Mr O’Shea: We provide depth maintenance at Fleetlands for the Chinook, Sea King and Lynx helicopter platforms, and for those same platforms in Almondbank we provide the dynamic components.

Chairman: Thank you very much indeed. David Crausby.

Q70 Mr Crausby: As I said in the first part, we have in the region of 586 helicopters owned, of which there are 17 types and several subsets within each type. So can you tell us what problems that fleet within fleet causes and what is the ideal situation we should be at? What kinds of numbers of types and subsets should we be aiming at and what would be the problems that are associated with all of that?

Mr O’Hara: I will take that first, sir. I think from a Rolls-Royce perspective obviously the greater the number of variants—and certainly I am talking obviously at an engine level—then it does entail that you need greater numbers of spares and different types of spares, more importantly, to support those subsets. The ideal is obviously that you have fewer numbers, certainly from an engine perspective, and therefore in terms of reducing the logistical footprint. On the Merlin, as an example, there are three different types of engines. With regards to different marks they are subsets of the RTM 322 but there are subtle differences, which although the pilots themselves in terms of overall operation will not be aware of, when you start to get to logistical footprints, when you start talking about a supply chain then obviously that entails that different parts have to be made. The ideal, certainly from an engine perspective, is to commonise where possible; that brings economies of scale into being and it means that there are less spare parts that you have to procure to support that activity, and overall that reduces the logistical footprint.

Mr O’Shea: From our perspective it is largely an issue of planning. I think from the commercial side commonality has been the key for a long time and that certainly drives down costs. In planning the aircraft the main issue is the supply chain because with the subsets of aircraft there are many subsets of parts that are required. So it is not a key to delivering the aircraft; the key is ensuring that you have the parts and that is really a budgetary issue.

Dr Nicholas: If I can add to that, as an equipment supplier to helicopters? It is a great advantage for us if we can have common equipment across a range of platforms; certainly from the supply point of view it makes it much easier for us to have common equipment. It will reduce cost because we can have larger productions runs. As my colleagues have said, it also eases the supply chain and the logistics chain. I think in addition there is also a big benefit across the wide range of lines of development in that we can train pilots, maintenance crew and our teams on a single set of equipment which they will find on a number of platforms, and that reduces cost and reduces repair time because we get a faster turnaround. I think one other really important point for us is that if we have common equipment across a wide range of platforms it makes it easier for us to justify investment in the new technology for the future so that we can improve the capability of equipment and deal with the threat as that evolves.

Q71 Mr Crausby: How big an issue is the training problem that we raised in the first part? The Chairman described the example of training on analogue systems only to operate on digital systems. Some answers to that were that we would get around that, but would you like to be the first person to fly with the pilot in an operation going straight on to a digital system?

Mr O’Shea: Clearly you want to be trained on the system that you are going to use and for commercial aircraft the whole cockpit management team has been there for quite some time, so clearly it has to be better to train on the systems that you are going to use.

Dr Nicholas: I think the same. We work very closely with the aircraft manufacturers to make sure that we get the right training packages in place, but a diversity of equipment certainly makes it more difficult for not only the pilots but other crew transferring from one aircraft to another; so if we can have more commonality of equipment that makes that transfer simpler.

Q72 Mr Crausby: Is it a serious problem in your experience?
Dr Nicholas: Anecdotally we have heard suggestions but I do not have any hard evidence of that—it would be anecdotal.

Mr O’Hara: I do not see that to a large extent from an engine perspective because largely the systems that we have are integrated with the cockpit, so the only example I could give is the transition from a
Procurement, the resourcing of the spares, the actual terminology—are directly responsible for the whole where we as industry—sorry to use the it is more on track with an availability contract, the legacy spares, as likely to have support issues in terms of the it is more traditional type support you are far more contracted to. So from an engine perspective where the type of support arrangement that we are

Mr O'Hara: cannibalisation issue.

forward. But we rarely find that we have a process would otherwise suggest, and bring it incoming aircraft to test it more quickly than the available. And from time to time, because we reducing, so there are donor aircraft coming.

Mr O'Shea: In some cases yes. I am afraid I do know.

Q74 Mr Hamilton: And this has to change for each one?
Dr Nicholas: In some cases yes. I am afraid I do not know what the impact of that is.

Q75 Chairman: That is not your field?
Dr Nicholas: No.

Q76 Mr Hamilton: Can I ask a question about cannibalisation of spare parts because it was raised earlier on. What are the problems in relation to cannibalisation of spare parts?
Mr O'Shea: We are responsible for three platforms: that is the Chinook, the Sea King and the Lynx. The Chinook we do not have a cannibalisation issue, and although the Sea King is 40 years old we do not have a cannibalisation issue there. Clearly there is some redundancy on the Lynx because their numbers are reducing, so there are donor aircraft coming available. And from time to time, because we operate pulse lines, we may have to take one from an incoming aircraft to test it more quickly than the process would otherwise suggest, and bring it forward. But we rarely find that we have a cannibalisation issue.
Mr O'Hara: From a large perspective it does depend upon the type of support arrangement that we are contracted to. So from an engine perspective where it is more traditional type support you are far more likely to have support issues in terms of the procurement of the spares, the legacy spares, as opposed to a more inclusive type arrangement where it is more on track with an availability contract, where we as industry—sorry to use the terminology—are directly responsible for the whole procurement, the resourcing of the spares, the actual forecasting of the spares, etc, which means that as a total package it is far easier to deliver the product that you are actually trying to get forward.

Q77 Mr Hamilton: So on the spares issue what improvements are you making to try and speed up the process to get spares on the field as quickly as possible?
Mr O'Hara: On the traditional side, it is things like life extension and it is about looking at the number of arisings; it is actually trying to stop the arisings from occurring in the first place. If you have deployed service engineers forwards with the units that are actually utilising the equipment you can actually stop something that would be coming back and therefore could be quite a costly rejection. Investing in repairs as opposed to actually utilising brand new components is another way of cost reduction as well; so it is all about working both with the people who are actually doing the level servicing—in some circumstances it is ourselves, in some cases it is partner companies—but at the end of the day it is working together to try and reduce the cost of those operations. That is in a traditional sense and in the availability we take a far more inclusive type of arrangement so that all aspects of the engine support are incorporated into that supply.

Q78 Mr Hamilton: Could I ask the final part of my question and that is the risks associated with putting a more powerful engine into an old airframe?
Mr O'Hara: Perhaps I should answer that. It is on a case by case basis. I think there was a particular case that you were debating this morning but I would talk about two subjects that I am aware of: one is with the Lynx, with the T800 and the second one is RTM 322 and we are proposing growth versions of that for the Merlin application. We have worked hand in glove with the aircraft manufacture so it is not about—an example was used this morning of almost overpowering the aircraft and therefore the aircraft not being able to take it. We have worked very, very closely in the integration programme of the LH TEC T800 on to the Lynx. The aircraft is well capable of taking the performance that it provides and therefore what we are doing, although we are an engine supplier and the engine is a product, it is actually increasing the capability of the air vehicle very, very significantly in an airworthiness role, in a safe method and a supportable method. On the RTM 322 we do have a bigger variant of that particular engine, with which we are in discussions and negotiations with AgustaWestland, and that similarly would provide the Merlin with increased capability in a safe environment and a supportable environment as well. So on a case by case basis we do have examples where we have taken engines, all being new designs, and they have gone into some aircraft that have already been out there for a long time, like the Lynx, and there are other examples where we are fitting it into newer aircraft like the Merlin. The final thing I would say, if I may just go a little bit further, we were talking about the RTM 322 integration into the Apache. I think in terms of taking one engine out and putting another engine
type in, that tends to be the textbook integration programme and everybody that was involved in it from the Authority, AgustaWestland, ourselves and Boeing, it was the textbook way of actually doing an engine integration.

Q79 Chairman: We were all told at the time though that it was a very dangerous thing to do.
Mr O'Hara: Before they made the judgment most people were concerned that it was a very, very large risk to the programme. It became very, very apparent when the demonstrator aircraft that was out in the States was not actually going to be required for the full extent of the programme, and LBA 6 demonstration programme in the States was cut short because of the progress and success that we had made in the States. The remainder of the flying was done on prototype aircraft in AgustaWestland in Yeovil.

Q80 Chairman: That was an experiment in a sense that worked. There have been lots that have not, have there not?
Mr O'Hara: I would not say from a Rolls-Royce perspective; I am not aware of any integration programmes that have not worked and I would not necessarily describe the RTM 322 going on to the Apache as an experiment; I think it was a calculated risk, people knew that there was a risk. Certainly from an industry perspective we thought that the risk was manageable and therefore we were very well engaged with the programme and keen to take it on.

Q81 Chairman: As the person who took the decision I suppose I should not really describe it as an experiment myself.
Mr O'Hara: I am not at liberty to comment, sir!

Q82 Robert Key: Can I ask you about changing operational priorities? Dr Nicholas, you gave us a very good brief, if I may say so, and one of the things that really struck me was your experience of UORs and you said that Urgent Operational Requirements are generally a disrupter to coherency, and you gave the example of the Chinook integrated project team being the only team that took up the challenge that you gave them in trying to get around this problem. In addition, future capability allows us to do other things on the site. But we would have to recoup that investment over—it could be made that investment if it was a much shorter term albeit as a sub-contractor to the prime, meant that we could make that investment. We could not have done that; we could not have made a business case if we had had very short term contracts on the platforms that were there. So it allows us to plan; it made that investment if it was a much shorter term contracts on the platforms that were there. So we find ourselves at the moment.

Q83 Robert Key: Do you see any end to this particular way of doing business?
Dr Nicholas: No, and I do not think we would necessarily want to. I guess we would like to see an end to the conflict, of course: but what we would like to see is more engagement about how the procurement process actually is used so that we can get the most cost effective and most future proof procurements in place in the circumstances in which we find ourselves at the moment.

Q84 Robert Key: Is this because there is such inertia at Abbey Wood, for example, that they are not anticipating the need to insert new programmes?
Dr Nicholas: No. I think the engagement we have had with Abbey Wood has always been very constructive. I think it is about the rules within which they operate and that sometimes they need to be modified as circumstances change.

Q85 Robert Key: In what way could they be modified?
Dr Nicholas: I think to allow more discretion would be useful.

Q86 Robert Key: Discretion in how they set the contract or discretion in engineering terms at your end?
Dr Nicholas: I think both.
Robert Key: That is helpful, thank you.

Q87 Mrs Moon: I would like to go back to the Defence Industrial Strategy. Is it an adequate basis for a relationship with you and does it place sufficient emphasis on competition?
Mr O'Shea: Maybe I could start on that, Mrs Moon. We bought the DARA companies and Fleetlands and Almondbank last year with effect from 1 April 2008. We could not have done that; we could not have made a business case if we had had very short term contracts on the platforms that were there. So given that the decision was made to privatise those sites the fact that we had a long-term relationship, albeit as a sub-contractor to the prime, meant that we could make that investment. We could not have made that investment if it was a much shorter term that we had to recoup that investment over—it could not have been done. So it allows us to plan: it allowed us to take on the 1200 people that we did; it allows us to do other things on the site. But we would like a restatement of that to ensure that it is there for us in the future.
Dr Nicholas: From our point of view the partnership model that was introduced in the Defence Industrial Strategy has been very helpful because it has helped us to build long-term relationships, both with the helicopter manufacturers but also with other equipment suppliers. I think the accompanying
Defence Technology Strategy has been very, very important in recognising the need to maintain a sovereign capability in the UK in some key technologies, which are fundamental to the defence industry and to the defence of the country.

Mr O’Hara: From a Rolls-Royce perspective we welcome the transparency, the clarity and the certainty that the DIS actually brought with regards to the relationship between industry and the UK MoD. We would welcome a DIS 2; we understand obviously that there are other priorities at the moment which are keeping us from moving forward generally on that, but overall we think it is a very positive way of describing the relationship and actually moving it forwards.

Q88 Mr Crausby: How big an issue is technological sovereignty? I read in the Defence Industrial Strategy that we will continue to invest in research and support of the development of key helicopter related technologies. Then it goes on to say that the investment averages approximately £13 million per year. Is that adequate? It does not sound very much to me for such an important field. What do we really need to do and how much money do we really need to put in, in order to maintain sovereignty over this level of technology?

Mr O’Hara: From a Rolls-Royce perspective we are heavily investing in our products on an annual basis. The DIS did not particularly mention propulsion systems with regards to R&T. There was an R&T project which was on fixed wing but it was not on the rotary wing side. So what we would welcome is the opportunity to discuss in DIS2 how we could work and move forwards in terms of R&T investment in rotorcraft products. We are investing in our products; we are bringing growth products back to the market—and I have mentioned one before in terms of the RTM 322. T800 was heavily invested in maintenance in Fleetlands would be 30. That is the contract was for—and they had never flown more than that. At this point we are heading past 16,000 hours on some of the platforms. That is what the contract was for—and they had never flown more than that. At this point we are heading past 16,000 hours on some of the platforms. Our contract was to deliver 27 to forward and we are heading past 16,000 hours on some of the platforms. Our contract was to deliver 27 to forward and we are

Q89 Mrs Moon: How do you feel the system of Integrated Operational Support is working? Is it effective?

Dr Nicholas: I cannot really comment on that because none of the contracts that I have fall within the Integrated Operational Support scheme.

Mr O’Hara: It is the same for Rolls-Royce. We have contracts in terms of whether it is traditional or the preferred availability type contract. Our services contracts are not under the prime contractor and are direct with the UK MoD. What it gives is direct visibility to both partners; it gives value for money; it gives benefits on both sides. So therefore we are not operating under an IOS scheme per se.

Mr O’Shea: We operate in two IOS schemes; there is the TLCS through Boeing and the other is the IOS with Sea King through AgustaWestland. Then we operate directly with the MoD, with the IPT Lynx. I think to look at Chinook—and my colleague David Pitchforth referred to it earlier on today—when we took over the contract they were flying 12,000 hours—that is what the contract was for—and they had not flown more than that. At this point we are heading past 16,000 hours on some of the platforms. Our contract was to deliver 27 to forward and we are currently at 30 today.

Q90 Mrs Moon: How do you feel the system of Integrated Operational Support is working? Is it effective?

Q91 Chairman: I thought he said 29.

Mr O’Shea: The Boeing number may be 29. Ours not in maintenance in Fleetlands would be 30. That is today and we will continue to do that. However, with the Lynx aircraft we are direct with the IPT but what we have done there is we have set up a logistical cell at Fleetlands where we have AgustaWestland and we have the project team itself and we have Vector Aerospace involved in it and that gets over the planning issues, the logistic issues and the supply chain issues as well.

Q92 Mrs Moon: Do you think that industry could take on a further expanded role in relation to preparation for aircraft for deployment and while in deployment? Is that something, for example, in terms of Rolls-Royce, in taking the maintenance of engines and the maintenance of defence equipment? Do you think that there is an opportunity for industry to expand into that in the field? Also, in
terms of the question David Crausby asked about the protection of staff in the Armed Forces, do you think you could get your staff to take on those roles in theatre and are they equipped and prepared to do that?

Mr O’Hara: We are already involved in what is called CONDO, which is Contractors On Deployed Operations. So although it is relatively small numbers what we have done is that we have assessed the risks, we have looked at the DEF STANS, we have looked at the depth DEF CONS that are applicable to it and found a way forwards for people who are not military—they may be reservists but primarily they are Rolls-Royce plc staff who have actually gone forward. I went out to the Balkans in the early 1990s as a field service engineer in a previous role, supporting operations. We know there are benefits for that; we have people there today on fixed wing and what we believe is that that would bring advantages to the role that the services have to do. At the end of the day it is about getting the skills sets; it is about getting the knowledge where it is necessary. As I have said before, if you have an ability to keep an aircraft flying then that has a significant impact on its operational capability. If you then stop an engine being removed as an item you stop it having to go through a large logistical chain to come all the way back for somebody to fix something that could have taken quite a short time to repair whilst on operations. So there are huge benefits to doing CONDO operations. We have looked at ways of doing that and we are prepared to do that; we do have people who would volunteer to do that.

Dr Nicholas: In the fixed wing arena rather than the helicopter arena we certainly had staff deployed in country during the first Gulf War and we are certainly prepared to do that in current operations. We certainly see a tremendous benefit in understanding how the equipment truly performs in theatre. If you can get very rapid feedback from the crew who are using it you can then optimise the performance much more rapidly. Also, we find that it is very motivating for our staff to get that close contact and understand how the equipment is really being used.

Mr O’Shea: We have people in Afghanistan as we speak. In December we were requested to assist through the project team and Boeing with people in Afghanistan and in early March we deployed eight people to there. We did the proper due diligence, the duty of care and we asked for volunteers and got many people who volunteered and we rotate those every four months for as long as we are required there. Certainly it is a motivational issue for our staff; they feel that they are part of the system that is being deployed. They see the aircraft in action as well as in the hangars and we are delighted to be involved in it.

Chairman: Thank you very much indeed. I think that we have no further questions for you and we would like to thank you enormously for coming along to help us with our inquiry; it is much appreciated.
Surveillance, Targeting, Acquisition and attack aircraft and is also doing ISTAR: Intelligence, will be aware that the Apache is a close combat contribute specifically to Task Force Helmand. You assets for the whole region and clearly also commanded by Major General De Kruif, so they are linked with the Regional Command South Mks 4 and 7. All of the aircraft are inextricably Apache, the Chinook and two types of Sea King, better daily. The aircraft we have there are the relationship with the defence industry is getting V out there which is making a tangible di- ference. Our you have been briefed, we have a Boeing Vector team industry contribution has been particularly good. As you achieve greater e-ect. It is obvious from what we are doing a great job. In particular, the people are in fantastic form and are doing an amazing thing in extreme temperatures and in the face of a very determined enemy, but also battlefield helicopter capability continues to increase whether it is aircraft, hours or the way in which in theatre at the moment we task them which is becoming smarter so we task them across the whole of NATO and Regional Commander just so we can make sure that the capability itself is held centrally by the stress that the capability does. For example, the Reserve Battle Group South is we can send in assets depending on what we want to do. We support that as much as we support the Commander of Regional Command South wants, so in all the roles I have just described they deliver that capability to the troops in theatre 24 hours a day seven days a week.

Q95 Chairman: How do the helicopters fit into the larger picture of what it is we are doing in Afghanistan?

Rear Admiral Johnstone-Burt: They are making a fundamental, battle-winning contribution. They are tasked by a full Colonel called Commander Joint Aviation Group and create whatever effect the Commander of Regional Command South wants, so in all the roles I have just described they deliver that capability to the troops in theatre 24 hours a day a week.

Q96 Chairman: Are you able to say to what extent we rely on our allies’ helicopters to support our troops and our allies rely on ours to support their troops?

Rear Admiral Johnstone-Burt: We are mutually dependent. We contribute to our allies as much as we contribute to ourselves. Task Force Helmand probably gets the lion’s share of the British helicopter capability. About 85% of our aviation resource goes to Task Force Helmand, although I stress that the capability itself is held centrally by the Regional Commander just so we can make sure that this is a team effort across the whole of NATO and we can send in assets depending on what we want to do. For example, the Reserve Battle Group South is based in Kandahar, as the fire brigade for the Regional Commander, and that brigade whizzes around the whole of Regional Command South depending on what hot spots the Commander wants to deal with. We support that as much as we support anything else. It is very much a team effort.

Q97 Mr Holloway: Can you give us some idea of what sort of activity the helicopters conduct in support of the so-called Comprehensive Approach?
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Rear Admiral Johnstone-Burt: I can in the widest possible sense without going into classified material. The Comprehensive Approach is a loose term which tries to embrace every aspect of warfare from humanitarian support operations right through to full-scale war-righting, stabilisation operations, counter insurgency and counter-narcotics. In terms of having a Comprehensive Approach our helicopters do all that. To reflect that, I give the example of the use of the Chinook, which goes back to my earlier point in reply to the Chairman about the way the roles are blurred as we become more sophisticated in dealing with such things as the hybrid warrior I have described, in the sense that one moment the Chinook can be used as the immediate response team in terms of delivering the medical emergency evacuation of troops with a consultant physician on board.

Q98 Mr Holloway: What percentage of helicopter usage is in support of the political and developmental side of the Comprehensive Approach? You say that 85% of the helicopters are used by Task Force Helmand. What percentage is involved in development and political stuff?
Rear Admiral Johnstone-Burt: It is very small.

Q99 Mr Holloway: One per cent?
Rear Admiral Johnstone-Burt: I would say 15 to 20%; it is pretty small. It is a rather vague term because it depends on what you mean by that. When you say “political”, for example our helicopters spend some time transporting Governor Mangal around with his team.

Mr Holloway: It cannot be as much as 20%, can it?
Chairman: It is very difficult to link the Comprehensive Approach to one particular platform.

Q100 Mr Holloway: It depends on how much is going on and how much of the emphasis is on military matters.
Rear Admiral Johnstone-Burt: If by “how much” you are referring to the transport of food or building material to help with the redevelopment of remote areas, it is hardly any at all. We use a contractor to do that. In terms of acting in a political sense it is about 20%. What you are really getting at is how much humanitarian support operations they are doing. Is that your question?

Q101 Mr Holloway: Yes—and the key political connections that we probably would not want to talk about.
Rear Admiral Johnstone-Burt: It is quite small.

Q102 Mr Crausby: Can you tell us something about older helicopters? They have been operating in quite a difficult environment, have they not? What do the Commanders in the field feel about their performance?
Rear Admiral Johnstone-Burt: Commanders in the field are extremely pleased with their performance. All the helicopters are performing extremely well considering the very high temperature which is now over 40°C with a 6,000 ft density altitude. Serviceability rates range between 70 and 75%. However, the older helicopters find it harder work and more of a challenge than the others, specifically the Sea Kings. We knew that they would struggle in those temperatures. Therefore, we fitted the Sea King Mk4 with Carson blades and a five-rotor tail and that has improved lift considerably, but it means that compared with the Chinook its capability is not as good as it would have been in temperate temperatures. For example, the Sea King Mk4 can take about six fully armed troops during the day and about 10 at night. The Chinook and Apache are doing brilliantly well.

Q103 Mr Crausby: Generally, is there a good feeling about the older helicopters and everything is secure in that sense?
Rear Admiral Johnstone-Burt: Yes; serviceability is very good indeed.

Q104 Mr Crausby: Is there a belief that it might shorten their lives based on the present figures?
Rear Admiral Johnstone-Burt: No, not at the moment.

Q105 Chairman: How many hours are the Sea Kings being flown?
Rear Admiral Johnstone-Burt: I am afraid we cannot give the number of hours flown.

Q106 Chairman: Am I right in thinking that the philosophy about the Sea Kings has been to fly them for a small number of hours in order to preserve their life for as many decades as possible?
Rear Admiral Johnstone-Burt: Not at all. To try to help so it does not appear that I am evading the question, clearly the aircraft themselves are fine and serviceability rates are extremely high thanks to all the things I have talked about with the Commander and the support we are getting there. Because it is such an abrasive environment inevitably we get through pieces of kit quicker, so rotor blades and leading edges can suffer because sand and dust get everywhere. Inevitably, you will get through component parts quicker, but the industry and integrated project teams are very good in front-loading our stores support system to make sure we get all the right bits at the right time. In that sense we are getting through things.

Q107 Mr Crausby: We had problems with rotor blades at one point, did we not, and those are now resolved?
Rear Admiral Johnstone-Burt: Yes, we did and that is resolved. We now have the Carson blades for the Sea King Mk4. This summer they will be available for the Sea King Mk7s, so that will be better.

Q108 Mrs Moon: You have talked a lot about how vital helicopters have become in theatre, in particular with their current use for a variety of tasks: reconnaissance, ISTAR and a whole range of movements since ground movement is increasingly
difficult and dangerous. What is your current manning situation like? Do you have enough pilots across the three Services?

**Rear Admiral Johnstone-Burt:** Yes and no. The manning situation as a whole for all our crew—air crew, ground crew and engineers—is okay and we are managing, but we are at maximum stretch and there are hot spots in certain areas depending on the fleet we are talking about. For example, we could do with some more pilots for the Apache helicopter, and I will tell you what we are doing about it. We could also do with more engineering technicians. As to the Apache crews, at the moment we have 40. We may go on to talk about Harmony, if you want me to deal with that.

**Q109 Mrs Moon:** I do.

**Rear Admiral Johnstone-Burt:** As far as concerns Harmony, we act by a rule of five, so it is one on four off. At the moment, to get a rule of five for our Apache crews clearly we need 45 crews. We are now at 40. We shall be at 44 by next March and we shall achieve 50 crews, which we are budgeted for, by March 2011. We are also drawing on the Royal Navy and Royal Air Force to help us with extra crews and instructors, which they have very kindly been able to give us. I am boosting the pipeline for pilots by 20%.

We are also looking at ways to retain our senior NCO air crew who are gold dust with massive hours of experience and are fabulous pilots. We are looking at ways to improve their pay scales and pension rights to encourage them to stay on longer than they might otherwise. In terms of the engineering shortages again we are looking across all three services and all my fleets at the moment. It is interesting that the Royal Navy and Air Force are overmanning us in terms of our engineering support in order to enable us to cope with the gaps and shortfalls, but that means drawing people from the rest of their core area. As far as the Army Air Corps is concerned the Royal Electrical and Mechanical Engineers are helping us by doing a review—the Apache, Lynx and also UAVs are our top priority—to make sure we get them fully manned as best we can.

**Q110 Mrs Moon:** One of the suggestions made during a presentation I heard in relation to helicopters was that some of the Harmony issues were being disguised in that people were being sent out with one unit and they returned and went to another unit and were sent out again with that unit. Therefore, perhaps the number of hours when people are required to spend in theatre is not as simple as has been portrayed because of lack of available crew. What would be your response to that? Are we at a point where because of the vital role of helicopters especially in the current theatre we are placing a disproportionate burden on those helicopter crew and maintenance people in terms of the hours they serve in theatre?

**Rear Admiral Johnstone-Burt:** I say we are not because we are monitoring the situation carefully. I have spent a lot of time on the Harmony of our people. The reason I say “no” emphatically is that the Joint Helicopter Command is completely integrated, so I am acutely aware of exactly who is out when doing what. I have talked about the rule of five, so it is one on four off. Our average deployment cycle is about three months, so that gives us a 12-month gap between tours. That is the rule of thumb we are using and it is working well in the Chinook, Puma, Merlin and Lynx communities, so I am confident that the points you make are covered in those crews. The areas that I am not so happy about are the Sea King and Apache communities where they are turning round the cycle faster. For the reasons I mentioned earlier, the Harmony rate for the Apache air crew, ground crew and engineers is about a rule of four, so one on three off, which is taking its toll. I am enormously concerned about that. Sea King crews are worse than that; they have a rule of between three and four, so they are doing one on two and a half off. That is something I monitor very carefully, not least because I am concerned about families, decompression and their ability to take stock and do what they all need to do when they come back home, that is, readjust, do the training courses they need to do, refresh their skills—aircrew, flying and technical skills—and then start to build up for their next period of operations.

The 12 months off sounds quite a long time, but it is not in the sense they have all those other things to do. We also talk about nights out of bed in the sense they have to do training which is not necessarily at home; it could be elsewhere in the UK or abroad. It is my top priority and greatest concern because the people are the greatest single factor; without them we cannot proceed, so it is a live issue that I monitor extremely carefully.

**Q111 Mrs Moon:** What impact does that have on retention?

**Rear Admiral Johnstone-Burt:** Retention is not as bad as I thought it would be. At the moment, compared with the service averages in the Army and Royal Air Force it is very small. We talk about the Premature Voluntary Release (PVR) rate; in other words, the rate at which people resign earlier than they would otherwise. For the Army and RAF it is a fraction, which is surprising. For the Navy it is slightly higher than the average for officers and about average for the other ranks. I do not want to use the present state of the economy to suggest that people will not leave because the possibility of getting other jobs is not as great as it was. I think that would be a false premise. I am doing all I can to make sure we look after our people and keep them while they are invaluable.

**Q112 Chairman:** You said that the Harmony rate for Chinooks and Pumas was one in five, for Apache one in four and for Sea Kings one in three or three and a half?

**Rear Admiral Johnstone-Burt:** Yes.

**Q113 Chairman:** What is the fundamental cause of the difference?
**Rear Admiral Johnstone-Burt:** It is entirely manning.

Q114 Chairman: What is the fundamental cause of the difference in that manning?

**Rear Admiral Johnstone-Burt:** The Navy has a different scale of manning according to their Harmony rules within the service itself. The rule of five that I mentioned just now is a Joint Helicopter Command Harmony rate that I created because it was sustainable and robust and I could guarantee that with 20% on operations and 80% doing other things I could ensure that was a robust, enduring capability at this tempo for the next 15 to 20 years. That was my yardstick. The Navy, Royal Air Force and Army have different ratio criteria because their roles are so different. In broad terms the Navy has a rule of three, one on two off, because of the time spent at sea. You cannot join the Navy and expect to be at home all the time. We have a one third, two thirds, rule. As a consequence, our establishment—in other words, the formula we use to work out the number of people to man our stations etc—is a smaller proportion than it is for the other two services.

Q115 Chairman: But looking at it from your joint position all of this must seem to you very strange. You must think that some of them have got it wrong. You can say “yes”.

**Rear Admiral Johnstone-Burt:** It depends on your perspective. If I was the First Sea Lord I would say it is not wrong at all because that is how from the point of view of the Navy he would cut his cloth. From my perspective it is not ideal at all. You are absolutely right. I have no hesitation in saying that I would like far more people in my Joint Helicopter Command organisation to make sure I can do my rule of five, but we do not have the people. Admiral Charlier may wish to speak on the Navy’s behalf because he is dealing with shortfalls elsewhere as well, so it is not a binary choice.

Q116 Chairman: Admiral Charlier, have you got it wrong?

**Rear Admiral Charlier:** No, I do not think so, and certainly the First Sea Lord would shoot me if I said we had. The Navy is configured against a set of parameters that it has used for many years that usually rotate round a six-month average deployment cycle at sea. We try to give the teams 12 months off after that. That means that 660 days over a three-year rolling period is the maximum time we can have people away. Those are the terms and conditions of service in which people join the Navy. They are very clear and we understand them. In a normal cycle of deployment at sea—in surge operations we are content to go outside those parameters and give more time when they come back—that works adequately. What I have to do to support the Joint Helicopter Command, quite rightly—we do the same with the Harrier force—having now become heavily involved in operations, is uplift the Royal Navy’s manning to cope with that particular circumstance at the time, which means I take the hit elsewhere. I tend to take it on second line manning. To answer your question, I do not think we have got it wrong at all; it works perfectly adequately in the normal naval deployment cycle we have generated historically of which we have a lot of experience. When we have surge operations, particularly in this joint environment, it is quite right to place a priority on that and take the hit elsewhere in the Navy. The only other way to do that would be to adopt a centralised Harmony regulation which in effect would mean overmanning the Navy compared with what the Department wanted of us in a normal circumstance, whether that was a training deployment or operation. Personally, I do not believe that would be a good use of taxpayers’ money.

Q117 Chairman: Can you identify a differentiation in premature voluntary release rates as between, say, Chinook crews and Sea King crews, perhaps caused by the difference in the Harmony guidelines?

**Rear Admiral Johnstone-Burt:** Not at the moment. The numbers are lower, although I suspect for the same reasons, because probably they are both going round the cycle as often as each other.

Q118 Mr Havard: That is slightly different from what I have been told in the brief. The brief seems to suggest that the Sea King Mk4 fleet with Harmony is down to one to 2.5 rather than one to four. I am told that that has a particular effect on the retention of that particular group of people. Are you saying that is no different from others?

**Rear Admiral Johnstone-Burt:** No, I am not saying that. The Harmony ratio that I gave is correct; it is one to two and a half.

Q119 Mr Havard: What effect does that have on the retention of that particular group as distinct from any other?

**Rear Admiral Johnstone-Burt:** As I have just mentioned, it is not good; that was exactly what I said.

Q120 Mr Havard: So, it is not good but it is no different?

**Rear Admiral Charlier:** Obviously, they are naval people and I take as much interest in this as my colleague. We work very closely together to look at peaks and troughs of retention and PVR rates. It is a much more complex position than you might at first think. If you work people hard in an operational theatre and continue to return them to that same theatre eventually two things happen: first, they become tired of that single involvement and all the pressures that go with it in the cycle, which my colleague has just mentioned; second, in the Sea King Mk4 force there are naval personnel with a particular sub-specialisation which is the littoral manoeuvre and amphibious warfare side, in this case flying. If you continually rotate them into a land-based operation so they are doing a single task, although the task varies within that operation, you combine the effects of both operational stress and the performance of a role which they are designed to do, but they have also joined the Navy and we have
to get that in balance. We work very closely together to try to balance the operational demands that must come first—there is no doubt about that whatsoever—with the performance of the amphibious and littoral manoeuvre task of flying at sea and embarking. We have to watch it very carefully to get it in balance because that gives the varied military career in which most of the people who have joined want to participate.

Q121 Mr Havard: Do you need to put more resource and therefore more people into that particular area? Therefore, do you need more people in the sense of the headline figure as well? It may be embarrassing to say that you need more people but if that is the reality is that what you need to do?

Rear Admiral Charlier: No. As I said earlier, unless we were to predict a 10 or 20-year cycle of continuing to support amphibious and littoral manoeuvre operations and singularly land-based operations, I do not think that to overman the Navy would be a good use of taxpayers’ money. The Navy is not designed around that process and that would require a whole change of policy to deliver it. It is up to us, the Commanders, to balance our people’s role in employment as best we can to advance the operational theatre with the budget we are given.

Chairman: I thought that was precisely the scenario predicted for the next 10 or 20 years.

Mr Havard: Quite!

Q122 Linda Gilroy: Are there any significant areas of capability for which you are unable to train because of the pressures of deployment and the Harmony issues that we have just been discussing? Are there things that you cannot train for in the UK that are needed in Afghanistan?

Rear Admiral Johnstone-Burt: Yes, there are. We have been in operations now for a decade in Joint Helicopter Command and for six years we have been in operations at full tilt. As a consequence, we talk about ourselves being on what we call a campaign footing. My focus has been exclusively on delivering success in Afghanistan and Iraq. Admiral Charlier has mentioned one area in which we have not invested as much as we should or would have liked: littoral manoeuvre and amphibious warfare. There are two aspects of that that are of most interest to me. One aspect is the embarked operational capability of my crews and forces which is the ability to land and take off from moving decks in rough seas by day or by night. That is what I consider to be a core capability because if necessary we need to do that come what may. We are just keeping the flame alive in that sense, but we need to work at it. The second area is larger-scale amphibious operations where we are moving companies of land forces, usually Royal Marines, from sea to shore by air or surface by the use of landing craft. That is a highly complex key capability. I commanded HMS Ocean for two years and was very much involved in doing that throughout that time. It is an extraordinarily complex choreography of moving parts that we need to practise all the time to keep the skills alive. To do that we have used HMS Ocean this year on something called Exercise Taurus in the Mediterranean and managed to keep alive that skill on a small scale but only that. HMS Ocean is still at sea in the Far East with a detachment of Lynx on board doing the same thing. Those are the areas where we are in danger of losing focus and we must concentrate on them. We shall do that next year and in 2011 in terms of our small-scale, focused intervention capability. This is an area in which Admiral Charlier and I work very closely with Brigadier Abraham to make sure we do not lose that capability but it is a vulnerability, if you like.

Q123 Linda Gilroy: How long is keeping the flame alive enough because your aircraft personnel have a life, a career, if you like and over time presumably that becomes more of an issue?

Rear Admiral Johnstone-Burt: It is certainly an issue for retention and it is something on which we need to work.

Rear Admiral Charlier: What we have to do—is keep alive what we call a seedcorn capability which we can grow by using often the experience of the more senior people particularly in day and night deck landing skills, but it is also related to the ship/air interface—it is exactly the same on the fixed-wing side as it is on the rotary-wing side—where the ship itself needs to understand aviation and the dangers thereof and how to operate a number of aircraft together on board as well as the air crew themselves. Although we tend to focus on air crew skills which are vitally important it is the whole package. We try to maintain the seedcorn skill and allow the squadrons to nominate those personnel who will be involved, concentrating particularly on keeping the junior members up to speed as they are the most inexperienced and building that through as has been mentioned, but there is one big exercise this year. Next year we have Aurora which is primarily a carrier strike exercise. We will have another big littoral manoeuvre section to it where we will get back as many people as possible for a reasonable amount of time to balance their operational training needs to make sure that that seedcorn is kept alive. What we are trying to do nowadays is be more clever in helping the JHC with its environmental training that it needs to do so people are forewarned before they go out to the operation to tie in with what we need to do in the sense of littoral manoeuvres. If you are clever you can programme those together so both gain a benefit from the same event.

Q124 Linda Gilroy: Are you able over a five-year period, say, to ensure that all personnel are able to keep those skills alive and fresh?

Rear Admiral Charlier: Yes, I believe we are but there is no doubt that we have to work at it.

Brigadier Abraham: In February, I and others gave evidence on recuperation timelines. As we have drawn down in Iraq, we are increasingly looking where we can to reinvest energy, time and resources into training based on contingent operational requirements rather than the specifics of
Afghanistan. The sort of things you have heard given as examples here will be incorporated in our progressive training plan to try to reconstitute and do expeditionary operations from a cold start.

Q125 Linda Gilroy: On the way ahead for defence helicopter training, at the moment that is done through the Defence Helicopter Flying School and that is contracted up to the end of 2012. I believe that a study is going on as to how coherent helicopter training can take place in future. Can you tell us a bit about that and also link that with the role of simulators? Our understanding is that simulation for helicopter forces is not as comprehensive as it could be at the moment because of limitations on the capacity and capability of simulators.

Rear Admiral Johnstone-Burt: At Shawbury, where we base our defence helicopter flying school, we train all three Services’ helicopter crews over a period of months before they go into their respective frontlines. It has been the subject of several reviews. The DHFS comes under the RAf; I do not own the Defence Helicopter Flying School in that sense. However, as you have already intimated, I receive the product from it, so it is very important that the output standard is the same as my input standard. That is working extremely well. You will know that the flying training system is being contracted over the next few years and that is why we are focusing very carefully on it to see how we can find any other ways to use the skills. The baseline core capability of our helicopter crews has gone up with the intensity and requirement of operations as you imagine. I want to make sure that that is absolutely dovetailed. You referred to training in the UK which is also quite pertinent to the DHFS. What I am trying to do at the moment is recreate the environmental conditions that we are experiencing in Afghanistan and Iraq. To do that I have to send my teams abroad to do training. We are talking about dust landings, extreme temperatures, mountainous terrain and density altitude. Afghanistan has both very cold winters with snow and sweltering heat, as it is now, and there are also extraordinarily low light conditions. We use the term ‘red illum’ which means that the ambient light levels go below 10 millilux; in other words, night vision goggles cannot pick up enough ambient light to discriminate and define shapes as well as they might. All of those conditions can be experienced only abroad and that is one example where we need to help transition our young air crew by introducing them to night vision goggles during their period of training in the different areas where they may train. For example, in Norway the recirculation of snow causes a ‘whiteout’ and that requires the same techniques for landing because you lose your visual references as you do with a ‘brownout’ caused by the recirculation of sand. Again, I think those techniques can be introduced earlier. There are other areas where I hope DHFS can standardise baseline training more comprehensively. That work is going on now. As to simulators, you are right. Our urgent operational requirement mechanism is fantastic and industry has done very well to deliver us capability so quickly.

One area that you touched on in your previous session was the theatre entry standard conundrum and the balance we had to draw between having the benefit of an urgent operational requirement in theatre and having enough to train on at home without delaying the deployment of that capability before everybody is trained. It is a balance. I can assure you that everybody has theatre entry standard training before they go, and I can talk a little more about it if you wish. To that end, we must ensure that people have that experience as early as possible and we standardise as much as we can across the fleets and have a common standard both in aircraft and training.

Q126 Chairman: In the interest of not covering too much ground again we intended to ask questions about theatre entry standard in our second session. That is not to say you cannot add something that is very useful, but we have a number of other questions we would like to ask you.

Rear Admiral Johnstone-Burt: As to the simulators, that lags behind the UOR process; that is the last bit. It is coming on line but it takes about 18 months for it to catch up. It is happening but the sooner we can do it the better.

Q127 Chairman: What are the main limiting factors in relation to helicopter availability? Would it be manpower, spares or the hours that they can fly, fuel or money? In order of priority what are the main limiting factors?

Rear Admiral Johnstone-Burt: I know that my deputy introduced the concept of the four-legged stool when you visited Middle Wallop.

Q128 Chairman: Perhaps I may say how helpful his briefing was because we were extremely impressed.

Rear Admiral Johnstone-Burt: Thank you. The four-legged stool analogy is simplistic but effective. The four legs are the people—the air crew, ground crew and engineers—the aircraft themselves, the support, which is all the equipment, and the training. For my 15 to 20-year robust sustainable capability on operations those four legs must be as strong and as long as each other; otherwise, the stool will fall over. There are strengths and fragilities in each stool depending on the aircraft type we are talking about, but one leg that is probably the least robust is the people. Without wanting to repeat myself, that is the one area on which I need to concentrate the most. All of the other legs are coming good very quickly. We must make sure that our training is realistic and there is enough of it and it is in time to give people confidence in themselves, their colleagues and the aircraft they are flying. As to the support and aircraft themselves, again we are reducing the numbers of fleets within fleets; there is a clear plan to standardise fleets to theatre entry standards, and you will hear more about that in a minute. I am most confident that we are coming good on the other three legs. My big concern is about the people leg and that is why addressing it is my top priority.
Q129 Chairman: Can you answer a question about the hours of helicopters? As we understand it, the Treasury of all people, have put a limit on the number of hours that helicopters can fly in Afghanistan. Is that correct?

Rear Admiral Johnstone-Burt: No, absolutely not. Brigadier Abraham may wish to add a little in a moment. If that were so clearly we would reduce the operational effect as a consequence. My whole drive is to see how while keeping the four legs in balance I can increase the capability in the hours we are flying in theatre. The hours are limited by those four legs of the stool, not in budgetary terms. Of course that is a factor according to what is achievable but that balance covers it, so the answer is no.

Q130 Chairman: So, there is no decree by the Treasury which say that Chinooks or Apaches can fly only x number of hours this month?

Rear Admiral Johnstone-Burt: No, definitely not.
Brigadier Abraham: I have never heard that before; it is not the case.

Q131 Mr Jenkin: I declare an interest on the Register of Members’ Interests. I arranged a fundraiser for Combat Stress earlier this year which was substantially sponsored by Finmeccanica. Earlier you mentioned hybrid warfare. You said in a recent speech that you would like to see “helicopters forces in the future swing from a symbol of fear to the enemy to one of hope to civilians and friendly forces.” What are the practical difficulties for helicopters in that swing role? What does that mean?

Rear Admiral Johnstone-Burt: Frank Hoffman, an American academic and former member of the US Marine Corps, coined that phrase in trying to describe the complexity of warfare we face at the moment in Afghanistan and Iraq, where you have an insurgent who has everything at his fingertips, whether he is using the latest laptop in the morning to stream video or whatever of IEDs to the local population or indulging in medieval warfare in the afternoon by cutting off people’s heads or whatever. We have an extraordinary creature who is using everything he can including the latest in technology to his own advantage. Michael Evans has said we are now facing a war in which Microsoft co-exists with machetes and stealth technology is met by suicide bombers. That really wraps it up. The advantage enjoyed by the hybrid warrior is the fact that he can move at will; he can exploit the dense urban environment and terrain; he can use the local infrastructure and transport facilities to hide, plan, attack and escape at will and use it to his own advantage in dislocating our own forces. My point is that the battlefield helicopter is the perfect antidote to the hybrid warrior in the sense that the agility, flexibility, versatility and potential lethality of a battlefield helicopter counter the apparent advantages of the hybrid warrior. As the roles of helicopters now begin to blur, which was why I referred earlier to being smarter about our tasking to create greater effect in theatre, what is happening is that we are using Apache not only for close combat attack but for reconnaissance, intelligence and surveillance. We use the Chinook both for emergency medical relief and assault operations. You can swing from one to the other and ditto across all the forces. You can pursue the hybrid warrior from the urban environment into mountainous terrain, desert and a maritime domain; you can swing straight from one to the other without having to recheck and reset your forces either conceptually or practically.

Q132 Mr Jenkin: This is about training and attitude, not about equipment or reconfiguring helicopters for different tasks?

Rear Admiral Johnstone-Burt: Exactly; and it is about optimising our equipment where we can to fulfil those roles, which is what we have done.

Q133 Mr Jenkin: Reverting to a previous conversation with my colleague, is it not a fact that combat operations tend to take priority and if there is a shortage of helicopter capacity in theatre it is the humanitarian and nation building aspect, the second part of the Comprehensive Approach, that loses out?

Rear Admiral Johnstone-Burt: That is absolutely right. We cannot do everything all the time, but my objective is to create a joint helicopter command that is capable of swinging from one to the other. What they actually do depends on exactly what you say: numbers, capacity and the priorities at the time.

Q134 Mr Jenkin: In that context, helicopters are the supreme force multiplier?

Rear Admiral Johnstone-Burt: Absolutely. What I love about them is that they can deliver tempo to the Ground Force Commander; in other words, they can ratchet it up or down, manoeuvre and put in fresh troops without breaking contact.

Q135 Mr Jenkin: It is small wonder that every Brigade Commander in Helmand has lamented the lack of sufficient helicopters. He has adjusted his operations accordingly, but if he had had more helicopters he would have been able to achieve a different quantum.

Brigadier Abraham: I am not sure I accept the premise that every Brigade Commander in Helmand has lamented the lack of helicopters.

Q136 Mr Holloway: Privately, yes.

Brigadier Abraham: I do not accept that premise.

Rear Admiral Johnstone-Burt: A Ground Force Commander will always want more helicopters for all the reasons I have explained. We have what we have got and we are doing the maximum with what we have got, and I think we can do better still. That
is my objective over the next two years or so of my appointment.

Q137 Mr Jenkin: The last time we were in Helmand we were extremely well briefed. It became apparent that in terms of driving the conflict into a new phase that was beyond the capacity of what we do in Helmand.

Rear Admiral Johnstone-Burt: At the moment in Helmand we are doing the best we can with what we have got. We have just had a massive influx of American aviation capability. Two hundred and ninety-five aircraft are arriving as we speak. We now have the Marine Air Group totalling 40 in Bastion and the C/AB is arriving in Kandahar as we speak. I hope that that will balance or cope with the huge influx of American troops of 21,000 or 22,000. We are in a dynamic situation at the moment, but aviation is something that we hope will improve all the time.

Brigadier Abraham: As to the provision of helicopters to Helmand, from November 2006 to date it has increased by about 84% by the summer of next year it will be about 115% expressed in terms of hours. As you know, at the end of this year and beginning of next year the Merlin force, currently finishing in the Middle East, will redeploy there and the buy of the T800 engines for the Lynx will allow us to use those aircraft all year round. These are sustainable increases in terms of the hours, but we are building it on a steady profile in order that we do not break the most important thing which my colleague mentioned earlier, which is the people part of the four-legged stool.

Q138 Mr Jenkin: I am grateful to you for putting that on the record, but it underlines that the complaints to which I referred earlier were probably justified.

Brigadier Abraham: I do not accept your premise that everyone has said that. Let me tell you what one Brigade Commanders told me. It was said in private, so I will not identify the individual. Helicopters are like money in your bank account. If you are asked whether you would like some more, the answer is always yes. Do you have enough to do what you have to do? The answer is yes.

Mr Holloway: You referred to the hybrid warrior. He is the one who is winning the battle for the people which I would have thought would be the only way to win this. What we face in Helmand is a peasant’s revolt rather than an insurgency; that is really the characteristic of this. What percentage of your helicopter hours is used in winning back the people as opposed to the military effect?

Chairman: You are asking the same question that you asked before, are you not?

Mr Holloway: I am, but it is a very important question.

Chairman: Putting it twice does not help.
troops, so it is not a net increase. The additional troops will also consume some of those helicopters.

Q143 Mr Havard: I understand all of that. It will also be interesting to see whether in the mix of assets that they bring some will be able to fly at altitude or just go and get the pizzas, but that will be for them to decide. Clearly, the distribution of it is important. As I understood it, there was also currently a NATO contract which supplemented the number of hours that helicopters would be available. Will that be continued, renewed or extended? What is happening to that aspect of it?

Rear Admiral Johnstone-Burt: That is called the ICAT which employs something called MI17s. As far as we know, that is continuing and it is hugely valuable. We also have something called the Raven contract which flies M117s and M126s. Again, they do all the freight, lifting and shifting and cover 82% of all our shifting around. The specific UK contribution has reduced, thanks to those two contracts, from 36 to 16% which is fantastic.

Q144 Mr Havard: But that aspect will not be sacrificed by the fact that the Americans are now bringing in a load of assets for their own use or other use?

Rear Admiral Johnstone-Burt: I sincerely hope not and I have been given no indication that they will do anything other than continue.

Chairman: I draw this part of the evidence session to a close and say to all three witnesses that we are extremely grateful. It has been very helpful and clear.

Witnesses: Mr Quentin Davies MP, Minister for Defence Equipment and Support, Mr Adrian Baguley, Head of Helicopters 2 and Commodore Russ Harding, Head of Equipment Capability (Air & Littoral Manoeuvre), Ministry of Defence, gave evidence.

Chairman: Minister, before I ask you to introduce your team I call on Mr Jenkin.

Mr Jenkin: There is an interest on the Register of Members’ Interests that I want to declare. I organised a fund raiser for Combat Stress in March of this year and Finmeccanica was the main sponsor.

Q145 Chairman: Welcome back, Minister. Would you introduce your team?

Mr Davies: With pleasure. It is very nice to be before the Committee again. On my left is Commodore Russ Harding who is in charge of the equipment capability aspects of helicopters, littoral manoeuvre and the sorts of things we shall be talking about. On my right is Mr Adrian Baguley who is in charge of the relevant IPT. Both of them have been closely engaged with me and advised me on the subject that is before the Committee today for quite a long time.

Q146 Chairman: Would you begin by saying where in your list of priorities you put helicopters?

Mr Davies: It would be quite invidious for me to set out a list of priorities in the sense that I think armoured vehicles, combat aircraft or ISTAR assets are number one, something else is number two and something else is number three, because military capability requires an awful lot of things which are interlinked. You really cannot have one without the other; you cannot deploy troops on the ground without equipping them properly. You also cannot deploy them without air support, so you need fire and close air support for them. Helicopters are immensely important right across the board and they are enormously important in the Navy. They are called the grey fleet and they consist of helicopters which carry our central antisubmarine capabilities, for example the Merlins, the anti-surface capabilities with the Lynxes and the AWACS capability which is particularly important when you deploy a carrier force. We have helicopters that are amphibious in the sense that they operate on ships but also on land.

The Sea King Mk4s are a very interesting example of that. The littoral manoeuvre helicopter is being deployed purely in a land environment in Afghanistan at the moment in support of our operations there. We need to have lift helicopters; we cannot operate without them. We have the wonderful Chinooks to carry out that role primarily which you know about. We need utility and close fire support helicopters, and the Apaches have done an absolutely wonderful, heroic job there. I believe that in battles like Musa Qala, for example, they played an absolutely decisive role. These things are enormously important; they are not just the platforms but the weapons systems and sensors that go with them. Above all, it is the men and training behind them and the motivation and courage of those people. You can imagine sitting in an Apache giving close fire support and being terrified in case you do a blue on blue, which would be a nightmare for everybody, or kill civilians which obviously we try desperately to avoid. We want to make sure that we win the engagement and save the lives of our people. It is difficult to imagine fully the intensity with which decisions must be taken in the heat of battle with bullets literally flying past you. We depend upon all these assets and the people who are doing a heroic job. My job as Minister of Equipment and Support is to try to make sure we support them to the greatest possible degree.

Q147 Chairman: That is a fair answer, but with some assets you can see their relevance and priority rising and falling in different operations. For example, submarines are of reduced relevance if we are concentrating heavily on Afghanistan. Would you say that helicopters are rising or falling in importance?

Mr Davies: Helicopters are absolutely key assets. We could not contend with the challenges in insurgency and counter-insurgency operations like those in Iraq and Afghanistan without helicopters.
Q148 Chairman: That sounds like a rising priority. 

Mr Davies: They have already risen to a very high plateau of importance. I am not quite sure how they could rise to a higher level of importance than they currently or prospectively will have.

Q149 Mr Crausby: Can you tell us something about the current single service approach to procurement? The Committee is a little concerned that the single service approach does not really address the cross-service requirement for helicopters. While I completely understand that you cannot put priorities in a league table in that simple way, does not the current single service approach to procurement mean that helicopters are everybody’s second priority?

Mr Davies: No. We do not have a single service approach to procurement in this country. Some countries do. I know that the United States has much more of that but we do not. For a number of years we have had a system of joint or cross-service procurement and it is very important that that happens. We always take a cross-service view. We have two organisations. First, the Equipment and Support (E&S) organisation, which is run by General Andrew Figgures whom you have met. It is his responsibility to look at the equipment and logistical needs of the Armed Forces as a whole. Second, we have the procurement agency now called the Defence Equipment and Support Organisation which is where the integrated project teams are located. Mr Baguley runs the relevant one. That takes a completely cross-service view as to its role and the needs of the Armed Forces. We have an all-service procurement system in this country; we do not have a single service procurement system, nor do we want it.

Commodore Harding: I am no better example of that. I sit here this morning as yet another Naval Officer. Mine is a competed purple appointment and amongst litigious manoeuvre I am responsible as the sponsor and owner of the requirement for air manoeuvre, ie all-battlefield helicopters from Chinook down to Apache, Lynxes and everything else. To back up what the Minister has just said, we do not take any form of single service approach to procurement. Of course the single services have a view; the frontline commands are not averse to popping a letter in the post and telling you where they think you have got your priorities wrong. In another example of the joint approach we take in areas such as anti-submarine warfare, for Merlin we take a programme approach. I own the platform aspects of that capability, ie the air vehicle itself, and my team looks across that and liaises with the other directorates in delivering that capability.

Q150 Mr Crausby: But each of the Services is bound to be focused within Treasury limits on its own issues, the Navy on aircraft carriers, the RAF on strategic air lift and the Army on armoured vehicles. How do we ensure that helicopters come to the top of all those priorities when each of the Services is so concerned about what it might see as being more important?

Mr Davies: Helicopters are terribly important for each of the Services. It is perfectly true that each is conscious of the particular role performed by a helicopter type. I have already given the example of the Sea King Mk4 where a helicopter type was used as both a naval asset and land asset. There must always be a theoretical danger of a particular service capturing the agenda and having excessive influence. I assure you that we are very alive to that. The whole culture of the Ministry of Defence is against that. It is my responsibility to make sure that I am not unduly influenced by one service and I keep in touch with all of them. It is important that you should ask that question and we should be alive to the danger even if it is merely a theoretical one but I do not think it is more than that. I should like to ask Mr Baguley to speak from his vantage point of the IPTs in Abbey Wood because again that is deliberately structured as a cross-service organisation.

Mr Baguley: It is. At the Defence Board level the Vice-Chief of the defence staff has a particular role to champion the cause of helicopters when it comes to debate about cross-departmental priorities. We often brief the Vice-Chief on the role and needs of helicopters. As the Minister said, within Defence Equipment and Support we have an organisation for the delivery of helicopter capability to all services. That is not in any way Service-driven.

Q151 Mr Jenkin: Does not each of the various competing Services looking for its particular requirement with a high determination to satisfy all the roles mean that we buy a rather expensive helicopter? Should we not be a bit more bog standard in our approach and try to give people 80% as opposed to 95 or 98% of what they really want? We could buy much cheaper helicopters and perhaps have fewer classes and run the fleet much more cheaply as a result.

Commodore Harding: I absolutely agree. I will let Mr Baguley answer on the question of cheapness and the cost. One of the things we must be careful about is that, in my first year of appointment, I have on more than one occasion been presented with windscreen sticker prices that you see in car show rooms which say, for example, that for only this much you can buy a really expensive helicopter? As opposed to 95 or 98% of what they really want? We could buy much cheaper helicopters and perhaps have fewer classes and run the fleet much more cheaply as a result.

Mr Davies: As both a naval asset and land asset. There must always be a theoretical danger of a particular service capturing the agenda and having excessive influence. I assure you that we are very alive to that. The whole culture of the Ministry of Defence is against that. It is my responsibility to make sure that I am not unduly influenced by one service and I keep in touch with all of them. It is important that you should ask that question and we should be alive to the danger even if it is merely a theoretical one but I do not think it is more than that. I should like to ask Mr Baguley to speak from his vantage point of the IPTs in Abbey Wood because again that is deliberately structured as a cross-service organisation.

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one of the key questions that Chief of Defence Materiel put to me was that I needed to assure him that should defence priorities change in 20 years' time, we could use those aircraft in other environments, i.e., the maritime aircraft over land—it goes without saying—and potentially the battlefield Lynx over the sea. I believe we did that last year.

Q152 Mr Jenkin: Even so, the future Lynx is a very bespoke requirement and it is hardly a matter of buying it off a production line rather like Mr Ford wanted us to buy model Ts. That is the other extreme. But if we are looking for a multi-role combat helicopter should we not seek to buy something that is much more basic?

Commodore Harding: If we go to the roles that that aircraft must perform, it has to go over the land in a battlefield reconnaissance aircraft role and lift some troops. When it is over the sea it must do two missions that we talk about: first, it must find, which is as easy and simple to understand as the meaning of the word, that is, it must find where the enemy combatants are; second, it must attack them. There are two quite broadly-based requirements for one aircraft in two subtly different variants, i.e., carrying radar and electrical optics and carrying missiles in the maritime role and then taking it across to the land role.

Q153 Mr Jenkin: The difficulty is that you have to buy them now; you cannot buy them when you need them. Looking at the Future Medium Helicopter perhaps we can come up with the concept that we just buy it off somebody's production line as and when we need it rather like we do with armoured vehicles now?

Commodore Harding: I think we have a good story in relation to that. Perhaps Mr Baguley wants to comment.

Mr Baguley: Certainly, for the Future Medium Helicopter we are looking to reduce the number of types that we operate within defence. I think you have already been briefed that along with any type comes a range of fixed costs associated with owning that type of helicopter. Our plan for the Future Medium Helicopter is to move towards fewer types. As to buying off a volume production line, there are not many military volume production lines around in the world. We are looking at whether we can buy either from some of those volume military production lines or volume civil production lines where helicopters can be modified for military use. That is all part of the strategy we are looking at in delivering the Future Medium Helicopter. I absolutely share your view. Commodore Harding and I are regularly pressing down on the requirement to make sure that it is not gold-plated and it is the minimum required to deliver the range of capabilities required of that platform.

Q154 Mr Holloway: To go back to what Commodore Harding said, what does the Minister think are the main concerns currently of frontline Commanders with regard to helicopters?

Mr Davies: I am sure you had an opportunity to talk to frontline Commanders in Afghanistan. They would recognise that the provision of helicopters has been steadily improving.

Q155 Mr Holloway: I am referring to their concerns.

Mr Davies: Their concerns are that they continue to have good helicopters and in sufficient numbers with sufficient crews to operate them. That may have been a major constraint. I think the story is a pretty impressive one. I do not think Commanders have great concerns. Obviously, everybody is interested in the Future Medium Helicopter and how we specify that and so forth.

Q156 Mr Holloway: I was trying to see how in touch you were with what they were concerned about. Even if they are relatively small matters, what sorts of things are they worried about?

Mr Davies: I go to Afghanistan every six months. We have a six-month roulement, so during the course of every roulement I am there. Obviously, I talk to the commanding officer and his staff; I talk to all sorts of people including helicopter pilots and people of all ranks. That is an opportunity to do more than I can do here just by interrogating PJHQ in England to understand people's real concerns. If you want a frank answer, I would not say that any of the sorts of concerns expressed to me have been about helicopters. Helicopters are an area where people feel we have made good provision and are making better provision. They know what is in the pipeline and what we are trying to do. There have been problems in the past about spares which I believe have been largely resolved. There are still problems about crews. I have had long conversations with Admiral Johnstone-Burt about trying to improve that. He has taken measures to increase the throughput of new trained crews. We are working on all of that. Nothing has been expressed to me as an urgent concern in the helicopter area by Commanders in the field, but I am very open-minded. When I go there again within the next two months—for reasons you will appreciate I cannot tell you the exact date—you can be certain I will ask that question once again.

Q157 Robert Key: Can we look at the whole question of life extension? I start by reporting from my constituency how pleased everybody is that the eight Chinooks that have been languishing at Boscombe Down are now being worked on very satisfactorily. I have been in them myself to see what is happening. That is very good news. Mr Baguley referred to the need to reduce the number and variety of helicopters. I believe I am right in saying that there are 15 major types of helicopter in service at the moment and about 13 marks or variations within that. Does that have anything to do with the delay in the decision on what is happening to the Puma extension project which was due to be announced on 31 March?

Mr Davies: To take those points in turn, thank you for your kind remarks about the sorting out of the problem of the Chinook Mk3s. I share your delight.
in the progress in that regard. In the next few months those aircraft will be available for deployment in Afghanistan or wherever, so as you rightly say that is excellent news. As to the number of helicopter types, you include things that we lease such as Squirrels and that sort of thing but I understand that you have made the calculation. Ideally, for the reasons Mr Baguley has already given we would have fewer types of helicopter. As to the Puma life extension programme, the Committee knows very well what our plans have been over the past two or three years. We have sought a life extension programme for the Puma and Sea King and to buy a little time in that way before we bring into service the new Future Medium Helicopter. We do not know exactly what that will be and to what extent it will be off the shelf or modified or will be something new. I have strong views on that which I am happy to talk about now if you wish. That is the position at the present time. I think I would be fully within the letter of my rights if I just left it there, but that is not the right way to treat a Select Committee. I did not think that was what when I was a member of a Select Committee and I do not think it is the case now when I am reporting to this Select Committee. I shall tell you the reason for the delay which is not a very long one. I have asked for a complete re-examination of this matter which admittedly is at the eleventh hour. It does not mean to say that we are to go in a different direction; we may go back to the model that I have just set out which is the formal position of the Department today. We do not have any consents from the Treasury or anywhere else to go in any other direction and I may not seek them. It may be that we shall decide to go in another direction, even at the eleventh hour, but we shall do it without holding up matters at all, so we shall take decisions very rapidly. The alternative, which I want to ensure we fully explore, is the possibility of dispensing with the need to spend the taxpayers’ money on upgrading aircraft which have reached a certain age. The Pumas must be 30 years’ old.

Q158 Robert Key: They were being designed when I was at school.
Mr Davies: It cannot be that long ago.

Q159 Robert Key: It was in the 1960s.
Mr Davies: There is the possibility of dispensing with those two life-extension programmes and bringing forward the Future Medium Helicopter procurement which would then certainly need to be done on a modified off-the-shelf basis. That is my strong preference for meeting that commitment anyway to avoid technical risk and some of the agencies we have had in the past with new projects of this kind. It would also mean an accelerated process of procurement. It would not be quite a UOR but possibly not the rather laborious full-scale classic international tender which up to now has been the policy and formally remains the procurement policy for the Future Medium Helicopter. I know this Committee does not like long answers, but I think you need to know the present state of affairs. I repeat the formal position of the department remains exactly as it was. We may well decide that that is the best way to meet the country’s needs in this area, but I want to make absolutely sure we have fully explored the alternative before we sign contracts. In any event we shall be signing contracts in the course of this year.

Chairman: In this case that long answer was extremely helpful.

Robert Key: Indeed it is, Minister, and it is very good news for the taxpayer. To spend £300 million on 28 airframes for an eight to 10-year extension, which is about £11 million each, when you can buy a new helicopter with a life of 40 years for £20 million seems to be rather strange arithmetic. Given that the crashworthiness, not airworthiness, of the Puma is not very good compared with a modern design—after all, we have lost 40% of the British military Puma force in 40 years’ service—surely it is time to press ahead with the new Future Medium Helicopter. I was delighted to hear you say what you did.

Q160 Chairman: I do not think you said quite that; you said that a decision was yet to be made.

Mr Davies: I did say that a decision had yet to be made. I simply want to ensure that we have explored all possible avenues before we take that decision. Therefore, I have instituted a rather last-minute re-examination of the problem. I do not believe that crashworthiness is a concept we recognise when applied to aircraft, whether rotary or fixed wing. I do not like the sound of that. I assure you that we would not dream of flying any helicopter that we were not absolutely certain was as safe as it possibly could be. One of the many considerations that must be looked at in terms of re-examining the procurement of the FMH as against the life extension programmes is the safety aspect. We may well find that the safety agencies that provide airworthiness certificates say we must do something much quicker with the Puma and perhaps the Sea King. Therefore we cannot possibly go straight away to procure the Future Medium Helicopter because we cannot know whether at some time they will withdraw airworthiness certificates. That is one of the many considerations in all of our minds as we go forward on this one. We take safety very seriously. Perhaps Commodore Harding would care to comment.

Commodore Harding: Perhaps at the beginning I may deal with the statistics and then Mr Baguley may say something further on your comment about crashworthiness. One thing we do in defence over time—I have a particular background in this—is work with the statistics agency to determine reasonable assumptions about the attrition of our aircraft. In the Navy we used to have what was essentially a management plan which bizarrely was called the Naval Data Book. The reason for it was that we used to put into it exactly the sorts of statistics you mentioned. You said that we had lost 40% in 40 years. We could have a little debate about whether 40 years is exactly the length of service of the aircraft, but as you go through it you do two things. The two compelling statistics that you work out are: how many aircraft will you lose over time
irrevocably because you bend it or crash it. We do damage categories from one to five. Category five means that probably you will not return the aircraft to service; that is a major loss of the aircraft. For categories three and four you would probably return the aircraft to service if it was economic to do so. To give an example, in the case of Sea King we used to assume a category five about every 55,000 hours. That was what we did with the Sea Kings from 1967 when it was introduced into service and took it through. Sometimes unbelievably it holds true over time that you will suffer damage operationally and in basic accidents. In the past I have caused an aircraft to suffer a small amount of damage in respect of propellers. Those things happen.

**Mr Davies:** It did not damage your career, did it?

**Commodore Harding:** Some would say it did, others that it did not. But one expects those things to happen. Without trying to elongate this, you take out car insurance because you tend to have small accidents. Therefore, we make that assumption. I would say that the reduction in the Puma force over time is not remarkable. I would have to look at the 40-year service; I think that may be at the top end and that the aircraft has not been around for that length of time; Sea King certainly has been. But it is not unreasonable to look at those statistics. We then make assumptions, certainly with fast jets, about attrition provision. In the past we have bought sufficient aircraft in advance at a good UPC with the manufacturer to make sure we have those attrition aircraft in place.

**Q161 Robert Key:** Minister, would it be fair to say that part of the reason for your review of this decision is that there are implications here flowing from the Human Rights Act and recent court decisions and also the Corporate Manslaughter Act and you would not wish to put RAF personnel or any service personnel into aircraft which did not have a very good record?

**Mr Davies:** Of course, none of us would wish or dream to put air crew into aircraft in whose safety we did not have complete confidence. I can give you the quick answer that considerations of human rights legislation and so forth did not play any part at all in the thoughts I have just expressed and the decisions I have made so far.

**Mr Baguley:** For clarity, we have a duty of care to our people under the Health and Safety at Work Act to ensure that the capabilities that they operate are safe and that we have reduced the risks of any major injuries or fatalities to as low as reasonably practicable. With the life extension of the Puma fleet, if we go down that route, there will be an extended exposure to risk. One of the key things we look at in extending the aircraft are the safety aspects. The principal safety hazard on Puma at the moment is associated with its engines and particular handling characteristics which is why, if we extend the life of the aircraft, we will replace the engines.

**Q162 Robert Key:** That will deal with the anticipatory issue?

**Mr Baguley:** That will have a full digital flight control system with digital engine control which will remove the anticipatory issue. We are also looking at part of the LEP to replace the cockpit instrumentation with modern digital instruments. We will also introduce a digital flight control systems. All of these things will improve the overall safety of that fleet, so safety is a paramount consideration whenever we consider extending the life of a helicopter fleet.

**Q163 Robert Key:** Minister, if you go ahead with the Puma life extension programme, all the work that Mr Baguley has described will be carried out in Romania. Would it not be better to do more life extension of the Sea King which would at least provide British jobs for British workers?

**Mr Davies:** My job is to try to spend the taxpayers’ money to achieve maximum effect in defence capability terms. There are obvious constraints on where we can procure equipment. We will not procure military equipment from China, Russia or somewhere like that for reasons you will appreciate, but I have no problems at all about work being done in Romania if that gives the best value for money. That is not a consideration. The other day there was a newspaper article suggesting that that was a consideration in somebody’s mind, possibly mine. That is not true at all. Nevertheless, we will apply consistent principles and get best value for the taxpayer. We need sovereign capability in this country in the areas of ability to maintain our platforms and upgrade them and military technology insertion. We need the design authority and systems engineering capability here. We do not necessarily need metal-bashing capability here. We need only what is necessary to buy here competitively, but I would be concerned about buying components, let alone sub-systems, from outside the European Union or NATO for obvious reasons. The broad arithmetic is that at the present time we are embarked on a course which would lead to our extending the lives of the Sea King to about 2018 and the Puma to 2022, in other words not a very long time for the investment required. As against that, we have the Future Medium Helicopter arriving perhaps in 2017. These figures have not been to the Defence Board; they are just provisional ones to give the Committee a sense of the orders of magnitude. I am not in any way committed to these particular numbers. Obviously, if we decided that we were able to forgo the life extension programmes that would require an earlier introduction of the Future Medium Helicopter by whatever means. If an alternative is not practicable we would have to revert to the original plan. I believe I have now set out the main criteria which we will be looking at in taking a decision on this matter.

**Mr Baguley:** To clarify the position on where the work will be done if we go forward with the Puma life extension, the bulk of the engineering design will be done in France where Puma was originally manufactured. A significant proportion of the installation of the engines and the basic work of refurbishment will be done in Romania and some of
the theatre-specific and UK-specific issues will be addressed within the UK. Broadly speaking, in economic terms 30% of the work by value will be done in the UK, 60% by value will be done in France and 10% by value will be done in Romania.

**Q164 Robert Key:** How big will be the dip in capability while we wait for the decision on Puma or Sea King and the arrival of a Future Medium Helicopter?

**Mr Davies:** We are trying to avoid dips in capability. At the present the Pumas are not being employed in Afghanistan; they represent a contingent capability to deploy if we really need them. We are looking at the issue of the extent to which we have that contingent capability in reserve, how much we need it and what risk we may place against it. But I do not anticipate or accept that there would be any great difference in the risk we took in the two scenarios. If there was a very great difference in the risk that itself might be a determining factor in deciding how to go forward.

**Commodore Harding:** A very good example, if you look at the written evidence submitted in advance, is the Sea King LEP. We have some older Sea Kings, the Mk6, which we have been operating to support Commander Helicopter Force in the past. It is up to Mr Baguley to conduct that review for the Minister and let him see all this background data. With the Sea Kings, I can probably buy into the life extension programme those Mk6s for use at Yeovilton to do the basic baseline training. They are not at the standard for Afghanistan but there are two ways to do training: that which you are about to do with all the display night vision goggles and basic instrument flying, engine off landings and everything else. Therefore, the IPT team leader for the Sea King is very confident that we will not see a dip and not reduce what Brigadier Abraham and others want in Afghanistan. If you look at our immediate support helicopters of which we have three, the Merlin Mk3 and Mk3A are just about to deploy and at the end of the year we have the Sea Kings and there will not be a dip. It means that with Puma as we take it back it will go through a rather more intrusive capability. The other point about Puma is that it is a step change in capability; with its engine the difference in what the aircraft can do over time will be quite amazing in terms of platform choice. We are underscoring that and saying to PJHQ that we believe we can deliver what they need.

**Q165 Mr Jenkin:** It would have been far easier to make these decisions if we had not taken £1.4 billion out of the helicopter programme in the early part of the decade and we would not have been messing around with a patch-up job on Puma; we would have gone straight for a new helicopter. But the real question is: why not take the opportunity now to reduce the number of helicopter types and buy new?

**Mr Davies:** We are where we are. We have to take decisions now in the light of the circumstances at the time. I do not want to waste too much time going back and rewriting history to see what might have happened if we had not done this, that or the other.

**Q166 Mr Jenkin:** We opposed that then and I presume you did, too.

**Mr Davies:** That could very well be the case. I am not even defending the decision now from where I sit. I simply say that I am not going to go back over that. My concern is to take the right decisions now.

**Q167 Mr Jenkin:** What about the reduction in helicopter types?

**Mr Davies:** I have a lot of sympathy for what you have been saying. I believe that the answers given by Commodore Harding and Mr Baguley also confirm that. All things being equal, it is better to have a smaller number of helicopter types. As my two colleagues know very well, several times I have pressed them on the issue of trying to make some helicopters which now have a single role have dual, even triple, capability. There are some possible opportunities for that. Therefore, all things being equal it would be a good idea. If we went for the more rapid procurement of the Future Medium Helicopter and dispensed with the life extension programmes, unless we procured several different types of Future Medium Helicopter off the shelf, which is a possibility, we would probably end up de facto with a smaller number of helicopters in our fleet. You will be aware that the Gazelles are running out of service and they will not be replaced. There is no reason to replace their capability; we do not need it any more. Again, that will be the elimination of a new type of helicopter, so we are moving in that direction. I agree that that is a favourable direction in which to move.

**Q168 Mr Jenkin:** We have 550 helicopters in the current fleet. How many helicopters do we plan to finish up with in 2020?

**Mr Davies:** That is a very good question but I cannot answer that precisely today.

**Q169 Mr Jenkin:** Approximately?

**Mr Davies:** I would rather not do that.

**Q170 Mr Jenkin:** Because it is embarrassing, is it not?

**Mr Davies:** It is not embarrassing at all. We are reviewing the whole of this and until we know which of the two routes we shall take I cannot answer that question.

**Q171 Mr Jenkin:** It is likely to be fewer than 300, perhaps 250?

**Mr Davies:** I should like to repeat what I said yesterday in the House. I am interested in outputs rather than inputs; I am not interested in counting platforms but buying capabilities.

**Q172 Mr Jenkin:** It will be fewer than 300, will it not?

**Mr Davies:** It will certainly be fewer than 550.

**Mr Holloway:** Can you say to the nearest 50?

**Q173 Mr Jenkin:** Do you not know?

**Mr Davies:** It is not a question of my not knowing. The numbers will flow from the establishment of the capability, so I really cannot give a precise answer.
Q174 Mr Jenkin: Eleven years is not a very long time in the timescale of helicopter capability.

Mr Davies: I will not make any commitment today. Let us see if we can give you some idea.

Q175 Mr Holloway: Can you give it to the nearest 50?

Mr Baguley: If I may, the intention at the moment is to acquire over 120 new helicopters in the next decade and we have plans in place to upgrade over 200 helicopters over that period. That gives you a minimum number that we shall be looking at. The decision on the final numbers for any of those fleets will be made only when we make the formal investment decision.

Q176 Mr Holloway: You must have some idea of the number to the nearest 50.

Mr Davies: I think that gives a number of between 300 and 400, does it not? I am not prepared to be tied down to any figure today, but we shall make an announcement in due time. Some of the helicopter types we have we shall run through to 2040. We have 48 Chinooks at the moment and they will go past 2040. We have 67 Apaches and unless we have attrition we shall keep those until after 2040. Therefore, a lot of the current helicopter types we have will go right the way through. Some of the helicopter types cannot go all the way through. We have already explained our plans to change that. To some extent it depends on which helicopter types we go for, which ones we purchase if we go for the Future Medium Helicopter, what capability we are purchasing and how many platforms we need. Therefore, the number of platforms should be a function of the capability you require, not the other way round. We start with capability.

Q177 Chairman: Yesterday you said you were more interested in outputs than inputs. I understand that while you are still making these decisions you do not want to be tied to any particular number of platforms, but there is something to be said for numbers as well as quality, is there not? There is something to be said for having the helicopters available to allow for increased tempo. Recently, Major General Barney White-Spunner said that, “In land operations, mass and tempo are key elements in tactical success and two available frames will always be better than one”. We understand the benefits of increasing the number of hours from the helicopters we have, but do you accept that there are genuine benefits in increasing the number of helicopters that we have in order to provide for that tempo and flexibility?

Mr Davies: I agree that there are certain minimum numbers that you tend to need for any particular tactical purpose, but I do not agree that two airframes are always better than one. For example, I do not suppose for a moment that two Gazelles are better than one Apache. That would be crazy. One Apache is probably better than 10 Gazelles. You can play this game for as long as you like, but it is not true to say that two airframes are necessarily better than one. There is another reason for my reticence in this matter. We have not decided which way we are going forward; we have not entirely decided on the contractual mechanism with which we will go forward. We will be going to suppliers and asking what they can offer us. I do not want to say in advance either how much money we are prepared to spend or exactly how many units we will buy. That is not a sensible way to go into commercial negotiation. We will enter into some commercial negotiations if we go the different route that I have outlined that we may possibly be considering at the present time. I am afraid that I am not prepared to give the Committee today any precise figures or a much better indication of the numbers than the ones I have just given to Mr Holloway. It may be that in a few months’ time we shall be able to give the Committee something slightly more precise about our projections.

Q178 Chairman: I have not been asking about precise figures but the general direction in which defence seems to be going with an incredible uplift in the capacity and capability of each individual platform but a general reduction in numbers so that the quality of numbers tend to be ignored or left behind. Do you not accept that that is a worry in the helicopter fleet as well?

Mr Davies: I totally accept that that is a trend in defence with improving technology. I also accept that in World War II we had perhaps 5,000 Lancaster bombers. We will probably get far more capability out of two or three JSFs in terms of the ability to strike the targets required with precision and effect. That is perhaps an extreme example but it is an accurate one; it is an instance of how technology drives the process that you have just described. Is that a worry? It is not a worry because I accept it. Does it mean that eventually we can have just one or two combat aircraft or helicopters in operation? Of course not. There comes a point when the graph begins to curve rather sharply and you no longer get advantage by replacing numbers with improved technology and effect. We have to look at it pragmatically case by case, weapons system by weapons system and platform by platform. The question is a very sensible, intelligent one and one we should always ask ourselves. It is not one that is susceptible to a very precise answer, but it is an issue to which we should be alive. It certainly means that we should not be in the business of just counting platforms or encouraging the public to pay Dover patrol, if you like, if they want to estimate what kinds of capability their taxpayer money is being used to purchase because that would not be a sensible way forward. We need to look at capability. What I want increasingly to contract for is capability through availability and capability contracts. We shall return to that in this particular context as perhaps in others.

Q179 Chairman: Against the background of the increasing capability of each platform but a reduction in the number of platforms we know that a gap is emerging. There will be a reduction or dip in the next few years, will there not?
Mr Davies: There will be a trend towards a smaller number of platforms in helicopters as in other systems for exactly the reasons you have described and we have both been talking about.

Commodore Harding: I go back to what I said about frontline commands telling us how well we are doing and everything else. In some areas when you have capability going out of service particularly during operations we the military want the old capability at this level and the new capability—that may not be numbers—at the same level. Occasionally, you have to accept the fact that it is not possible to do that. There is one example in the grey fleet which is the Merlin Mk1 to Mk2 programme where we are changing processes, bits of the cockpit and the aircraft down at Culdrose. There will be a dip down to a level that we have deemed to be as low as we can go while the aircraft are returned to the manufacturer for rework. They are not building new aircraft. A number of aircraft will go back into the factory to be reworked and there will be a dip over time that you have to live with. If you have new aircraft coming in you will try all aspects to make sure that those numbers go down and numbers come up. Over time in real life that is quite a tall order and it is expensive. I go back to the point that during operations you have to get that right. Outside operations you can take what we call capability holidays where we accept that as a big aircraft or new project comes in we might have to transfer over the people. A good example is the Navy’s future carriers. You have to take the older carriers out of service earlier to get the people off them retrained and refamiliarised with the new ships and put them to sea. There is no other way of doing that other than by employing vast numbers of additional people. Therefore, on some aspects there are things we are able to do. Perhaps I may add one thing about the numbers about which you asked. Over the period since we built Gazelles, Lynxes and everything else—I refer to the different roles and everything else as the Minister said—one bit we sometimes forget is that when we speak of the Defence Helicopter Flying School those aircraft are leased; the contractor delivers the service and everything else. There are other areas in the world where we have contractors providing the aircraft as well—Brunei, Belize and in the future, Canada for the British Army training range at Suffolks—because it is a better way of doing it. Sometimes there is a considerable number of aircraft in those three or four areas. Those numbers appear to show a huge fall-off, whereas we are just doing it in a different way as the Minister said and it is effective, if not more so.

Mr Baguley: For the record, we currently lease 67 light helicopters. If we look at the overall numbers we also need to consider which helicopter types we are reducing. It is at the light end of the scale and that is because some of those roles are being taken over by other assets such as UAVs.

Q180 Linda Gilroy: I want to ask about urgent operational requirements which are essential and for the most part greatly welcomed when they arrive but sometimes at the expense of maintaining coherence in the aircraft available in future. How does this affect planning? Is the impact of the number of available aircraft on the future coherence of the fleet, if that is the right term, absolutely inevitable? How do you plan that into all of the future scenarios that you are looking at?

Mr Davies: UORs always do raise the issue of coherence because the theory is that you are buying something for just one particular campaign and operation and may not want to keep Lynx or “Wildcat” in core defence capability. That is the theory of it, but in practice you may well say that there are other insurgency-type operations in similar conditions and that something you have purchased for one particular UOR ought to be kept in permanent inventory and you should maintain the support, spares, training and so forth accordingly. There have been some good examples of that in the case of armoured vehicles where the issue of coherence particularly arises. It does not arise so much in the case of helicopters because we are re-engining the Lynx. That is a very important programme to make it available to fly the existing Lynx, not you Lynx or “Wildcat” in hot and high conditions. Apart from that I cannot think of another instance where we have used UORs and helicopters.

Q181 Linda Gilroy: What about defensive aids suites?

Mr Davies: Defensive aids suites can be slightly different in different theatres because of different conditions. For example, in Afghanistan there are different altitudes from those in Iraq, which for the most part is pretty flat. That is one reason why these things are different. But it may well be that having installed their defensive aids suites they are perfectly adequate for another campaign. We cannot predict in advance whether or not there will be a problem of coherence there or not. Broadly speaking, subject to what Commodore Harding may say all the kit that has been modified by UORs in the field of helicopters is such that we would not really want to change it at the end of an Afghan campaign and when that arises. Obviously, I cannot predict exactly when that might happen. In other words, those enhancements will be permanent and useful ones and the defensive aids and certainly the engine upgrades are good examples of that.

Q182 Linda Gilroy: They may be permanent for one particular aircraft but not capable of being permanent for others and therefore there are some compromises?

Commodore Harding: There is a tension with UORs in the first place. I do not intend to sound patronising, but it is urgent and you are trying to get it out. That is one of the areas where initially there is a lack of coherence. You try to get to the boys and girls on the frontline a new camera that an aircraft has never had before and so you rush through with the manufacturers the fitting of that camera once you have established its requirement and understood what you want. You very quickly work back to make sure you have resilience in the training aircraft. While in an ideal world you would say that if that camera or a defensive aids system is the one to be used in Afghanistan, we should fit it all the way back across
the fleet, the trouble with that approach is that you want to take out as few aircraft as possible to do it and so it takes time. You may get to the point where you spend five years fitting this particular camera as a defensive aid system and find it is a wasted resource. Therefore, there is tension in getting it out and how much you fit it and everything else. Another good example is that one of the reasons we are taking time to re-deploy the Merlin out of Iraq and re-deploy it in Afghanistan is that we intend to change some of the theatre-essential upgrade equipment. Though it may seem difficult to understand, there is a different threat and we must take time to fit that equipment to those aircraft. Having done that to the aircraft we need to fly out, we need to train the crews who will go with those aircraft at the end of the year. Therefore, in relation to the whole thing about “fleets within fleets”, which you are possibly talking about, that is something we must do. There is no doubt that the Chinook has a high number of different marks, variants and everything else inside it. We have already contracted for the first part of that programme, and we hope to go to contract very soon for the whole Chinook fleet and say that we need to design and incorporate a certain number of the UORs and get the equipment fit standard so that the crews can jump into an aircraft and it does not have something here, a bit over there and everything else and they have to do a little course to make sure they can fly that particular group of 19 over there.

Q183 Linda Gilroy: I think the answer to the question whether it is inevitable there is a certain built-in incoherence in UORs is yes?

Commodore Harding: Yes, if you do not want to waste resource.

Q184 Linda Gilroy: I think the Committee would like to know whether you doing your best to minimise that?

Commodore Harding: Yes. I came back into this job just over a year ago. I have to say that I was positively surprised by the way the relationship between the Department and Treasury was going in that it was working seamlessly. Over time we are learning lessons. If we go back to the Sea King Mk4 fleet and the upgrades we requested to take it from one theatre to the other, there are now bits that I have gone back to rework. If we look at what we did on Merlin over a year later and what we asked the Treasury to approve, we changed our approach. In some areas we asked for more of certain things and we were then required to provide the evidence to support them. We were grilled pretty hard, but we managed that. I think there is a positive story to tell in that respect. We are now going back to re-examine what we have done. As to Chinook, in relation to coherence and “fleets within fleets” where it becomes chronic, you have to go to the point of spending resource to get the aircraft to the necessary level.

Mr Baguley: Certainly, in relation to the Merlin force, Mk3 and Mk3A, that Commodore Harding has just spoken about, we are bringing all of them to a common TES standard. As to the Chinook force, we are also trying to bring it to a common standard. As to the Lynx Mk9 force, we are bringing all of it to a common standard and fitting it with T800 engines. We are also bringing the Apache force to a common theatre standard. Where we can we try to reduce fleets within fleets and the theatre entry issues.

Q185 Chairman: But this message does not seem to have got through to the men and women we met at Middle Wallop and Yeovilton who said that sometimes the theatre entry standard equipment in which they found themselves flying in Helmand province was something they saw for the first time when they got to Afghanistan. We are hearing a very good story from you, but we heard a different one from them. Why is that?

Mr Davies: I do not think it is right to comment on that.

Commodore Harding: I heard the industry session when that question was asked. I think Mr Hancock asked the question. We think it may have been AH where we use some of our aircraft for environmental training outside this country; ie the high and hot bits, that is, the experiential bits of piloting the aircraft in that respect. At the beginning I referred to Sea King Mk4 and the enhancements we asked for to take it to Afghanistan compared with what we have now provided for Merlin to go to Afghanistan where it is a full fleet fit; all have been fitted with the right number of fits. There are bits going back there.

Q186 Chairman: What is the right number? Does the right number include a number of training aircraft for the UK?

Commodore Harding: Absolutely yes. You have a choice: either you make the decision to go to Afghanistan and outfit the whole fleet with the equipment or—I think this is the right approach—you outfit all of the aircraft. There are 28 Merlin Mk3s and Mk3As; it is not a huge fleet. It seemed to make sense. The Treasury and the Department accepted that we should fit all 28 and, based on the number or aircraft we keep permanently in theatre, which is a number we will not mention here, run that back through the maintenance requirement and the number you need to train people on that specific equipment before they go back to theatre. You buy sufficient number to fit them. There is a balance between splurging and saying you require 28 of these. I believe there is a balance in the investment decision to be made. I would be the first to cry—because I signed the business case with Mr Baguley—if I did not think we were asking for the right amount. In the case of Yeovilton and Middle Wallop, it is perhaps incumbent on us to trace that bit down to ground. I wholeheartedly agree. About two months ago I went flying in Sea King Mk4s using display night vision goggles. In some respects given failures and things not coming back out in some cases they seemed to be treating one or two of them as gold dust. Since then we have come back and said that this little box of tricks cannot cost a huge fortune; there are things we need to do here. That is why in particular I go round the air station COs regularly so they can download on me, but if there is something we have not picked up it is incumbent on us to do so and I will take that action.
Mr Davies: Let me place on record that it is an absolute principle when we buy new equipment under a UOR, apart from the core defence programme, that we buy sufficient number to ensure people can be trained on exactly that type of equipment. This goes across the board; it is not just helicopters. We always specify the numbers and amounts of equipment we need to procure taking into account the training programme. Before we do not have anybody going out to theatre who has not been trained on the type of equipment, whether it is weapons, communications equipment, armoured vehicles or what have you, with which they will then be working in Afghanistan. In the best run organisation something sometimes may just fall between the cracks. I trust that has not happened on this occasion. We will pursue it. That is an absolute principle. Sometimes I have expressed frustration because we cannot get more of something out into theatre—I will not say what it is—and I am told, “No, Minister; we really need this number here for training.” We have that dialogue the whole time. We take the training requirement very seriously and do not want our men and women to go out to Afghanistan and run any risk at all because they are suddenly confronted with something on which they have not already been properly trained. It is an absolute principle that before we send anybody out to a war zone they are given the best possible training on exactly the kit they will use in theatre.

Q187 Chairman: All we can tell you is what we heard from the men and women undergoing the training before going out to Afghanistan.

Mr Davies: I am grateful you have told us about that. Obviously, no one wants to break any confidences here. There may well have been something that has fallen between the cracks and Commodore Harding will look into it, but I want to reiterate the general principle on which we place a very great deal of importance.

Chairman: It sounds a good general principle provided it is adhered to in practice.

Q188 Mr Holloway: If you have only a limited amount of kit and it is desperately needed in theatre it is not unreasonable to get it out there and sort out the training aspect later. Surely, that is a priority; it works both ways.

Mr Davies: I believe that you were a professional soldier in an earlier incarnation. I am not sure that you would have said that at the time.

Q189 Mr Holloway: I can give you an example of where we received a piece of equipment. Although there was not very much of it we were very grateful for it and did not really care whether or not we had had the opportunity to be trained on it back in the UK. I think there are times—I am helping you here—when it is reasonable to send stuff over in that way.

Mr Davies: You are trying to help me but I stand by what I have said. As Minister for Defence Equipment and Support, I believe we should rigorously uphold the principle I have just enunciated and do not send people to a war zone and ask them to try out equipment with which they are not familiar in the face of enemy fire. I do not believe that that is the right principle. Normally, we will withhold equipment until we have at least the minimum number of people who are properly trained on it. That is how we operate generally and also in the area of helicopters.

Q190 Chairman: This principle applies not only to the use of the equipment in the face of enemy fire but also the maintenance of it that needs to be done out in theatre, presumably.

Mr Davies: In other words, you are saying that people would not be maintaining equipment that had not been maintained elsewhere?

Q191 Chairman: Yes.

Commodore Harding: I think I can reassure you that if something is needed tomorrow in Afghanistan and a UOR comes out from PJHQ and people can be trained in theatre by a small team which goes out there that is what we would do.

Q192 Mr Holloway: I worry about dogma getting in the way of practicalities.

Commodore Harding: Yes.

Mr Davies: But whether we train in theatre, Salisbury plain or whatever the important thing is that we train.

Commodore Harding: Let me give a good example where we are making a wholesale change. In the up-.engining of the Lynx Mk9 with the T800, which is the engine to go into the future Lynx, the Wildcat, some of my colleagues in DE&S have said that those aircraft will be delivered on that date and therefore they can be deployed shortly thereafter. Commander JHIC and his team have said that we can do that but not until those crews have learned to refly that aircraft with a substantially different instrument panel and engine—there are other issues with the way the aircraft flies—and have done hot and high and environmental training. You get a certain enthusiasm to put the kit out earlier and in some cases you push back, but I reassure you that if there is a piece of kit—I can give examples but they are classified and I will not reveal them here—where you take it out and do the training there, but you are not talking of an aircraft or engine change; you are talking about that which goes in the hand and can be easily assimilated, and I think we have a good story on that.

Q193 Linda Gilroy: If helicopters are force multipliers would not spending a greater proportion of the defence budget make a great deal of sense and be a very cost-effective way of improving the capability of our Armed Forces as a whole? I suppose the simple question is: why do they not get greater priority?

Mr Davies: I have tried to illustrate that they get an awful lot of priority and shall be spending a large number of billions of pounds on helicopters over the next 10 years. For reasons I mentioned earlier I shall not be more precise than that. There are always decisions to be taken on priorities. We want to maintain the right balance between different capabilities that we require because they are all interdependent. If you look at our plans I do not believe you can say that we are giving them too low a priority. I hope that the next time you go to
Afghanistan you will specifically ask Commanders what they think about the availability, sustainability and quality of helicopters and check it against the answers that we have tried to give the Committee today. I believe you will be encouraged by the responses.

Q194 Linda Gilroy: The responses we get will certainly reflect what you have said, but they will also reflect the fact that more helicopters can always add to capability. Last time I was in Afghanistan there was a very strong wish to see more helicopters, particularly newer ones.

Mr Davies: I agree with you, and that is why we are providing more helicopters. We do not talk about the number of assets we have in theatre, but I have already said that the Chinook Mk3 will be available for deployment there within a few months. The first Merlin will also be available for deployment there in the next few months. The first re-engined Lynxes will be there in the early part of next year. We are making a very substantial commitment and I hope the Committee recognises that. It would be very churlish and rather perverse not to recognise that. A very considerable effort is being made.

Q195 Linda Gilroy: I am quite sure we will recognise that, but whether we conclude there are sufficient numbers and capability to add up to the required force multiplier in difficult places like Afghanistan, taking into account all the other things we have discussed today such as the availability of training etc. is a matter to which we will give quite a lot of consideration. I do not think we can take it from the information you have offered us today that as much is being done as is optimal in terms of the capability that our Armed Forces need in Afghanistan.

Mr Davies: Of course you do not just rely on what I have said to you today, nor would I expect or want you to do so. We want you to cross-check it. I quoted the figures in the House yesterday. There has been an 80% increase in helicopter hours available since November 2006 when the present pattern of war-fighting there has emerged and been sustained. By the end of next year the figure will be more than 100%.

Mr Baguley: It will be 116%.

Mr Davies: I repeat I am interested in capability and that is why those figures are very important. That is a function of the number of platforms available which we are increasing. It is also a function of good and increasing support and sustainability and having the necessary crews. That is a matter of good and I do not disguise that fact from the Committee. There will be more crews. I was not present during the previous session. I do not know to what extent you dealt with that with Rear Admiral Johnstone-Burt. Normally, I do not get involved in training, recruitment and remuneration issues but I have done so in this case. I have been talking to him about what we can do to improve retention and recruitment and we are making some substantial changes in those areas. As a result of all this I hope you will conclude that we will do everything possible to maximise the support Commanders require in the field of helicopters as in others in Afghanistan.

Q196 Linda Gilroy: We shall see.

Mr Baguley: I can give an example of where we have pulled together the four legs of the stool about which Commander JHC talked earlier. As to the Chinook force, we are now delivering 25% more hours without adding a single helicopter. That is why you need to be very careful about looking just at helicopter numbers.

Commodore Harding: Certainly I and perhaps others sitting here need to look at the other forces because the Chinook model that I hold up needs to be replicated in other places. We need to see how we get that sea change in doing that.

Q197 Chairman: I want to end by trying to get to the bottom of something which I do not yet understand. Is there any system of limiting the number of hours of helicopters?

Mr Davies: A system whereby you say to the Commanders in the field that they cannot fly more than a certain number of hours?

Q198 Chairman: Yes.

Mr Davies: I know you like simple answers, Chairman: no. Commanders are absolutely free to use their assets as they wish. We would not dream of imposing such a constraint on them.

Q199 Mr Holloway: Surely, they are constrained by maintenance schedules. Aircraft need to be maintained, so what you say cannot be correct.

Mr Davies: You have completely misunderstood me. There are always constraints in life. We are increasing the number of helicopter hours available to Commanders, but the Chairman was asking whether we are imposing an artificial limit and saying that Commanders must not use a particular platform for more than so many thousand hours a year or a month. You had in mind whether we were giving some instruction of that kind because we were worried about the sustainability of the kit. It is entirely a matter for Commanders in the field to judge how they use the hours available. We are not constraining them.

Mr Holloway: Available hours are a constraint.

Q200 Mr Jenkin: You have referred to the hours available. Suppose a platform is due for a period of maintenance after a certain number of hours. Is it at the discretion of the Commanders on the ground to say that even though there is additional risk of flying extra hours without that maintenance the priority is to fly this mission now? Is that within the discretion of Commanders or are they imprisoned by the maintenance schedules?

Commodore Harding: I am not intimately familiar with each and every service’s aircraft and the discretion available, but I can give my own experience in operating Sea King helicopters and other fixed-wing aircraft. In the maintenance regime, engineers can defer a certain amount of maintenance on a calendar basis and by hours. That is irrefutable and it is part of our engineering principles and everything else. If you ask me how much a senior engineer for the Chinook detachment on the ground in Afghanistan can defer some of his maintenance I cannot answer
that, but in my service in the Fleet Air Arm a certain amount of maintenance can be deferred by the senior engineer on the ground. As we have done in the past, if there are other maintenance issues—say there is a crack or something—you speak to the engineering authority back at the main base.

Mr Baguley: One of the things we have done with the contractors for the Chinook is to deal in theatre with some of those maintenance activities which ordinarily would have required the aircraft to be withdrawn, so in that way we keep those aircraft in the frontline.

Q201 Mr Jenkin: But the Commanders are not given a budgeted number of hours?

Mr Davies: No, they are not. These are matters which will be discussed between a Commander and his chief engineer. The Commander may say that he wants to surge some helicopters in an operation in the next few days and says, “Do you mind postponing this maintenance?” That dialogue takes place between the Commander and his chief engineer. It is up to the Commander to use his judgment as to whether he wants to override his own engineer. I want to make absolutely clear that we do not get involved in that. What I am trying to answer very precisely is that we do not send any central direction to constrain Commanders in the use of their assets in theatre, whether helicopter hours or anything else. The implication was that we were doing this for budgetary or other reasons. Obviously, there are physical constraints; there always are. It is patently obvious that there is a certain number of helicopters, armoured vehicles and men there and they cannot be increased over night; that is a physical constraint, but there is no directional constraint or order from the Ministry of Defence not to use equipment which is available to Commanders; it is for them to determine based on advice from their own engineers what to do with the kit we have provided.

Q202 Mr Holloway: We have been engaged in the so-called war on terror for eight years. It stands to reason that you are limiting the number of hours available to Commanders by giving them x number of helicopters that do x number of hours. This is tautology.

Mr Davies: We are giving them x number of helicopters and they are doing more hours the whole time. The helicopters have been made more serviceable and we are increasing productivity, if you like. We have dealt with some of the bottlenecks on spares and we are dealing with some of the others in relation to crews, trying to make sure that those assets can be worked more and more. They are being worked more and more and at the same time we are supplying the new assets and platforms that I have described. We are making a double effort to increase the availability of helicopter hours.

Mr Baguley: If there are to be significant increases in activity, in order to deliver the repairs, overhaul, servicing and spares to support, then we need to plan ahead. Obviously, as you increase activity you use more spares and have more repairs and overhaul. We need to look ahead with operational Commanders at what the likely demands will be.

Commodore Harding: You are asking us very good questions. As Mr Baguley has just said, you plan ahead. We have a department process where I with Mr Baguley must look at how many hours across fleets over 10 years we will fly. The operating budget for the first four years is owned by Commander JHC; I own the bit after that. You look and decide how many hours you anticipate flying so that creates a tension between PJHQ and the commitments and capability area behind me and everything else. But it comes down to the sustainable number of hours of the people themselves. Commander JHC spoke about the four legs of the stool and everything else. There is a maximum number of hours in joint regulations that we set as a tripwire for our Commanders in theatre, for example Commander Joint Aviation Group in Afghanistan. It is really a supervisory role. I will not say what the number of hours is. It is not that sensitive, but I do not think we should be quoting it. If your crew start to approach that number in theatre you do not worry but begin to discuss it on the ground with fellow Brigade Commanders et al. You may say that you have done so much this month and you have to be careful, not because of the aircraft themselves but potentially because of the maintenance and air crew.

Mr Davies: I can sum it up by saying that we are interested in providing sustainable capability. If you run a war you cannot predict what will happen at any one point. There may well be cases when you have to surge things. You cannot by definition surge all the time; if you do your crews will be damaged and your aircraft will not be maintained and they will not work. Eventually, you will not have any capability at all. We plan things on the basis of sustainable capability and that is why we look at the four legs Mr Baguley has talked about and are very conscious if temporarily we may be extending maintenance schedules or putting more pressure on crews. That cannot be sustained and Commanders in the field know that, but they must make these judgments. That is not only their professional right but their responsibility and capability in theatre.

Chairman: Thank you very much. Minister, you said you would be prepared to answer our questions for as long as we wished to ask them. We have now come to the end of what we wish to ask in today’s very helpful evidence session in which we have gone into this matter in some depth. We are grateful to all three of you.
Written evidence

Memorandum from Sikorsky Aircraft Corporation

INTRODUCTION

1. Sikorsky Aircraft Corporation is a recognized world leader in helicopter design, manufacture and support. The company’s military products include the BLACK HAWK and SEAHAWK™ helicopters, as well as the CH-53 heavy-lift helicopter. Sikorsky also is producing militarized versions of its commercial S-92™ helicopter that today are performing search and rescue missions for the U.K. Maritime and Coastguard Agency and transporting the Heads of State of a half-dozen nations. The United Kingdom Royal Travel Office has operated a VIP Sikorsky S-76 + for the last ten years and in November 2007, The Royal Household again selected Sikorsky as Preferred Supplier for the Royal Family helicopter with the selection of a new delivery Sikorsky S-76C+ which is scheduled to enter service in the 3rd Quarter of 2009.

2. Additionally, Sikorsky is preparing to launch a new BLACK HAWK variant specially configured for international markets. Sikorsky’s factory in Mielec, Poland, will manufacture this aircraft, the S-70i. Worldwide, Sikorsky employs 15,000 people, and its aftermarket business, Sikorsky Aerospace Services, operates globally to maintain both rotary and fixed wing aircraft.

3. Sikorsky is a subsidiary of United Technologies Corporation (UTC), which is the 39th largest manufacturer in the U.S. and the 59th largest publicly held manufacturer in the world. Its other subsidiaries include Otis Elevator; Carrier Corporation, maker of air-conditioning and heating systems; UTC Fire & Security, which includes the U.K.-born Chubb and Kidde products; Pratt & Whitney, maker of aerospace propulsion systems; and Hamilton Sundstrand, maker of aerospace systems. UTC recently was named as Fortune Magazine’s “Most Admired Aerospace and Defense Company.”

4. Sikorsky was founded in 1923 as the Aero Engineering Corporation by aerospace pioneer and legend Igor Sikorsky. The company was acquired in 1929 by the United Aircraft and Transportation Corporation, which later became United Technologies Corporation.

HISTORICAL AFFINITY BETWEEN SIKORSKY AND U.K. AVIATION

5. Today’s modern military helicopter evolved in part as a result of Sikorsky’s and the UK armed forces’ joint experiences. At key periods in aviation history, the two entities’ paths intersected, benefiting both, as well as the entire aerospace world.

(i) In January 1945, The Helicopter Training School was opened at RAF Andover base. This also was Europe’s first helicopter flight training school. The aircraft used to train Royal Air Force pilots was the Sikorsky R-4, which in 1943 had become the world’s first production helicopter. The R-4, designated as the Hoverfly I in the U.K., is credited with training the first British and American military pilots.

(ii) The RAF realized the R-4’s potential quickly and helped bring it to the attention of the U.S. military. Only after the British had ordered well over 100 R-4 helicopters did the U.S. armed forces follow suit.

(iii) The R-4 performed the world’s first military combat rescue mission, in 1944. An American crew rescued a team of downed British personnel behind enemy lines in Burma. The R-4 and the Sikorsky R-6 would become the only helicopters used in World War II.

(iv) Sikorsky continued to refine the R-4 and developed the S-51, which in 1947 became the first helicopter in U.S. Navy history to perform a rescue. Sikorsky licensed the U.K.’s Westland company to build the S-51, helping to position Westland as the leader in British helicopter development. In December 1948, the first Westland-Sikorsky WS-51 successfully completed its inaugural flight. Westland then produced the Dragonfly HR.1 helicopter used by the Royal Navy’s first operational helicopter squadron. Westland also produced several variants including the Dragonfly HC.2 medical evacuation helicopter, all based on the Sikorsky designs.

(v) In 1952, the Sikorsky S-55 established a world record by becoming the first helicopter to fly across the Atlantic Ocean. Sikorsky in 1950 licensed Westland to build this aircraft, which in the U.K. was designated the WS-55 Whirlwind and served the RAF, the Royal Navy, and the Queen’s Flight.

(vi) In 1958, Sikorsky’s S-58 became the first helicopter developed for a U.S. President, Dwight Eisenhower. Westland was granted a license to produce this aircraft as well, calling it the Wessex. The U.K. helicopter’s missions included serving the Royal Marine Commandos.
(vii) Sikorsky later produced the S-61, which was the world’s first helicopter that could both hunt and destroy submarines. In 1962, the S-61 set a helicopter speed record of 210 mph. This was the first time a helicopter had flown faster than 200 mph on an established course. Sikorsky licensed this technology to Westland in 1969, which resulted in production of the Sea King fleet used by the Royal Navy and Royal Air Force for search and rescue, anti-submarine warfare, and troop transport missions.

(viii) Four S-92™ helicopters are currently performing search and rescue missions for the Maritime and Coastguard agency as part of Interim SAR, the final stages of which are to be adjudicated later this year.

6. Sikorsky believes these commonalities provide a strong understanding of the U.K.’s military helicopter capabilities—past, present and future.

HELICOPTER REQUIREMENTS FOR TODAY’S MISSIONS

7. With today’s global war on terrorism, high value is placed on helicopter capabilities that provide mission flexibility, effective tactical response, multi-climate operability, supportability, and economic value, all in a single platform.

8. Conflicts can spark up in any of the world’s troubled spots and escalate into regional, continental and global crises, a possibility recognized by virtually every government today and consistent with the fundamental planning outlined in the newly updated U.K. Strategy for Countering International Terrorism (March 2009) as well as the U.K’s counter-insurgency strategies.

9. Additionally, counter-insurgency wars such as in Afghanistan are likely to become prolonged and resource-consuming, which means helicopters must meet demanding standards for durability and reliability. Thus, platforms best-suited to serve today’s military needs are those with:

(a) Multi-mission capability: Able to deliver troops and supplies in diverse geographies and climates, to perform in combat, search and rescue, and Special Operations missions, and to support the “hearts and minds” operations vital to counter-insurgency success, such as delivering medical supplies and food to indigenous populations.

(b) Interoperability: Able to communicate and team with other friendly nations’ aircraft in joint operations. Multi-government military and intelligence alliances are vital to combating terrorism. As stated in the U.K.’s updated Strategy for Countering International Terrorism, “We recognize that partnerships in this country and overseas are essential to our success …”

(c) Proven ability to perform in many climates, with high availability, survivability, and reliability

TECHNOLOGY REQUIREMENTS FOR TOMORROW’S MISSIONS

10. History shows that military capability standards must rise, necessarily and continually, as threats become more lethal. The growing threat of insurgents obtaining chemical, biological or nuclear weapons is often cited as tomorrow’s greatest risk.

11. Future helicopter capability must provide for operability in the most extreme situations, as well as magnify all current capability for maneuver, speed, stealth, weapons delivery and survivability. Near-term future technologies that will enable this include:

(a) Full, fly-by-wire control and pilot training to use it to maximum advantage

(b) Safer, all weather operating systems for extreme environments ranging from deserts, where brownouts now present serious risk to aircraft upon landing, to frigid terrains where rotor icing and other complications pose high danger.

(c) Much greater speed for increased strike force effectiveness, survivability and rapid reaction

(d) Aircraft control systems that require less human involvement. Aircraft that can be flown with equal effectiveness by one crew member versus several, as conditions require, will enable greater human focus on the actual mission versus on flying the helicopter.

12. Longer-term future capabilities should include:

(a) Systems and components that automatically adjust to changing conditions without any need for human intervention

(b) Aircraft that are completely “self-actualized,” meaning they can complete missions without any onboard crew, while making any course adjustments and taking any defensive or offensive measures that are necessary to accomplish the mission.

6 April 2009
Memorandum from SELEX Galileo

SCOPE

1. This memorandum is intended to add to the Committee’s body of evidence by highlighting the benefits of a coherent, cross-platform approach to the purchase and support of defensive aids equipment for helicopters. The memorandum provides an overview of:

- Equipment Coherency, what it is, what are the benefits
- What has been done and where we’ve got to
- The impact of the current operational environment
- The top-level conclusions and recommendations.

HELICOPTER SELF-PROTECTION AND SELEX GALileo

2. SELEX Galileo (herein referred to as SELEX) has been at the forefront of Electronic Warfare (EW) in the UK since the late 1960s, providing equipment to enhance situational awareness and platform survivability. As part of the Marconi Company, the company developed the radar warning receivers for the Phantom, Jaguar and Buccaneer aircraft that were later fitted to helicopters. Since that time the company, now part of the Finmeccanica Group, has been continuously involved in the design, development, manufacture and support of self-protection equipment for air and naval platforms.

3. As well as developing and supplying individual equipments, we have worked with the MoD to develop Defensive Aids Systems (DAS) by integration of EW equipments. DAS provides a superior level of self-protection for platforms operating in the most hostile environments. Starting in the 1980s with the introduction into service of the Zeus system for the Harrier GR5 & 7, SELEX has worked continuously with the MoD to develop and evolve the skill-sets and technology in order to provide a high level of protection for front-line platforms. This culminated in the HIDAS self-protection suite for the UK’s Apache AH Mk1 Attack Helicopter and the DAS for the Typhoon F2 multi-role combat aircraft, both of which comprise EW equipment from SELEX. The efficacy of HIDAS has been operationally proven in Afghanistan and, according to Press reports; the system enjoys a high level of confidence from those who fly the UK Apache (see Annex 1).

4. HIDAS is widely recognised as offering the highest level of platform protection. The relatively high cost of its development and deployment was entirely justified on the grounds that a high level of protection was afforded the complexity and spectrum of the anticipated threats. At the time that HIDAS was introduced, the cost model used for the Apache could not underpin the requirement for other platforms in the fleet, which were expected to operate in a lower threat environment.

5. In the intervening period, we undertook a series of company-funded studies into the cost benefits of a holistic approach to the provision and support of Defensive Aids across the UK helicopter fleet. In the same time period, as the Committee is aware, the threat environment faced by transport and support helicopters radically altered due to the nature of the conflicts.

DAS COHERENCY WORK AT SELEX, 2004 TO 2009

6. Our EW products are installed on a variety of platforms in the UK helicopter fleet. In addition to HIDAS for the Apache, we have provided and support radar warners for the Sea King, Merlin, Puma, Gazelle, Lynx and Chinook. We have also provided the integrated DAS capability for the Chinook and have been selected to supply the integrated DAS for the Army and Navy variants of the Future Lynx. Notably, the acquisitions were made by individual MoD Integrated Project Teams (IPT) and/or platform primes with each platform being subject to individual bespoke support arrangements.

7. In 2004, with this situation in mind, and against the background of the MoD’s emerging Future Rotorcraft Capability initiative, SELEX commenced a series of company-funded studies to establish the cost-benefits likely to accrue from a coherent, fleet-wide approach to the provision and support of helicopter DAS. The results of the initial study were presented to the MoD early in 2005 and this led to further work including workshops with experts within the MoD.

8. Since 2007, as part of the UK EW Tower of Excellence, we have been working with other UK industrial partners on studies into the next generation of DAS architectures for helicopters and other airborne platforms. One of the goals of this work is to develop cross-platform coherency. The work will be continued later this year as a Technology Demonstrator Programme in which an open, integrated architecture will use some of the advanced sensors and countermeasures that are being developed under UK MoD funding. Whilst this vital capability improvement is sponsored by the MoD research programme, it is worrying that there is as yet no obvious pull-through to mainstream acquisition programmes.

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1. Hereinafter referred to as DAS Coherency.
9. A number of conclusions can be drawn from the work to date:

— Adoption of a flexible, fleet-wide coherent DAS solution could provide a number of benefits, including improved usage and availability and better exploitation of investment leading to assured capability maintenance and growth.
— Larger production runs lead to economies of scale. Further savings can be made in the overall Through Life Support costs.
— The current continuous competition that results from the present, stove-piped IPT approach has an adverse effect on the UK’s EW capability. Funding that could be used to invest in new or improved products, is instead used to fund expensive competitive tenders. This promotes a short term view that weakens the UK’s overall capability.

RESULTS OF DAS COHERENCY

10. Engagement with the MoD led to a coherent DAS solution being selected for the Army and Navy variants of the Future Lynx. This DAS, based on the HIDAS architecture, uses equipment already fitted to other UK helicopters. This brings capability and cost benefits from having common mission, equipment support and training solutions.

11. In parallel, the MoD Central Customer developed the Common DAS (CDAS) Air Platform Protection (APP) Strategy that seeks to provide:

"more capable systems, which deal with the full range of potential threats; using DIS-compliant equipment; to provide common solutions across the range of air platforms; supportable and affordable through-life".\(^3\)

One of the cornerstones of the Strategy is to achieve maximum DAS coherency across platform types to improve overall availability and minimise cost of ownership. The APP Strategy is intended to be accomplished incrementally through various funding routes, including UORs and Equipment purchases. Successful accomplishment will require cross-platform and cross-IPT buy-in.

12. The heart of the CDAS strategy is the common architecture, which is based on HIDAS. As well as the Apache and Future Lynx platforms, the architecture has been implemented for the recent Chinook DAS upgrade and is planned for the Puma Life Extension Programme. Coherency on the equipment support side is making some progress with moves underway to provide a common cross-platform support solution for the Sky Guardian 2000 radar warner, an integral component of HIDAS. On the Mission Support side, SELEX-produced Merlin Integrated Electronic Warfare System is used by the Air Warfare Centre for mission data programming and replay for a range of platforms.

CHANGING OPERATIONAL PRIORITIES

13. Urgent Operational Requirements (UORs) are generally a disrupter to coherency. One of the early arguments against DAS Coherency was that only part of the fleet (Attack Helicopters) was expected to operate in a truly hostile environment and hence justification for fitting a comprehensive DAS to all helicopters was weak. Clearly, recent combat operations have involved a wider range of helicopter platforms.

14. The need to react rapidly to asymmetric threats, in order safely to provide support to the troops on the ground, mandated the use of UORs. Unfortunately this results in a disjointed solution across the fleet that only addresses today’s perceived threat, cannot readily be absorbed into the coherent solution and has larger longer-term costs.

15. A coherent approach would have benefited the short term and long term platform capability and through-life support.

RECENT UOR EXPERIENCES

16. As stated above, it is our experience that UORs are a disruptor to coherency strategy. For the recent round of helicopter DAS UORs, SELEX responded in line with the MoD’s APP coherency strategy. Solutions were worked-up for, and presentations made to, a wide range of interested parties including the MoD Central Customer Chinook, Puma, Sea King, Helicopter and Islander, and Merlin IPTs, and the Joint Helicopter Command. Only the Chinook IPT took up the challenge. By adopting an intelligent approach to the UOR, they have gained a growth-capable architecture using legacy equipment that is coherent with the MoD’s APP strategy. This will ease capability & technology insertion in the future. For instance, Hostile Fire Indication can be readily integrated.

17. Timeframes, funding and lack of inter-IPT coordination militated against coherent solutions on the other platforms (Sea King Mks 4 and 7, Puma, Merlin Mk1). Instead, the MoD generally adopted an interim solution that met the immediate requirements, allowing a small number of aircraft from each fleet to be

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\(^3\) This quotation is taken from a 2008 UK RESTRICTED presentation given by DEC(TA).
deployed. However, the downstream consequence of this is that money has been spent on a “fleet-within-fleet” short term solution with no long-term support strategy. In addition, future capability insertion will be more onerous.

**NON-EQUIPMENT DEFENCE LINES OF DEVELOPMENT (DLOD)**

18. Our experience is that for both Equipment Purchase (EP) and UORs, insufficient attention is paid to the Logistics tail. For UORs, DLOD only get the limited attention necessary for the short-term needs. Equipment programmes have varied approaches but, in our experience, generally only cover an initial, short period of support. In our experience also, the support package included in UK EP contracts can vary from the supply of limited support documentation, to one including documentation, spares, test equipment and extended warranty.

19. Despite being a key enabler to getting the full capability from modern defensive aids equipment, the tools used for DAS mission planning, testing and replay, are often relegated to a less important role. They are rarely included in the EP contract and the user can be faced with capabilities that are present in the equipment but cannot be used operationally because the Mission Support Tools to exploit them have not been procured.

20. DAS training is another key area that is often neglected. It is hampered by lack of hardware with the result that the aircrew’s first experience of the equipment is when they use it in anger in theatre. In association with the Chinook UOR, we worked up novel, low-cost, bench-top and in-cockpit DAS training solutions that were rapidly prototyped using the SELEX Concept to Capability Synthetic Environment at Luton. The proposed solutions were extensively demonstrated to the prospective stakeholders such as the platform IPTs and the relevant MoD players. However, despite everyone agreeing that it was an innovative, low-cost solution, there was no take up.

**RELEVANCE TO OTHER SECTORS**

21. Coherency is also highly relevant to DAS for Fixed Wing platforms and to platforms in the Naval and Land domains. Of course, there is nothing unique about DAS. The principle applies equally to other military equipments. In fact, we have an early example of the benefits of coherency in the MoD Thermal Imager Common Module (TICM) programme that was started in the early 1970s. Looking forward, areas such as AFVs, ISTAR and Battlespace Integration would appear to be ideal candidates for adopting a coherent approach for selected capabilities across their “fleet”.

**PULL-THROUGH OF RESEARCH AND DEVELOPMENT**

22. Export sales generate the financial returns that allow UK industry to invest in Research and Development across a wide range of technologies applicable to helicopters, fixed wing, naval and land platforms. The products and services provided to the UK by SELEX benefit substantially from our company funded R&D. Recent examples of DAS programmes that have benefited include those for the Chinook and for the Future Lynx. We are also supporting the UK’s work on Hostile Fire Indication and on advanced DAS architectures.

23. Despite the demonstrated effectiveness of integrated defensive aids, most of the DAS and other sensor equipment used by UK Armed Forces is procured as individual items. The user therefore cannot benefit from integration of data and functions. This approach is largely due to emphasis of competition for the individual items rather than taking a holistic view and fully engaging the principle suppliers. The success of HIDAS, and its derivatives, indicates what can be achieved. It should be noted that elements of the UK MoD, in particular on the Science &Technology staff, are totally supportive of the holistic approach. However, because of the constraints placed upon them, the platform IPTs are driven to make independent equipment selections. It is anticipated that this situation will improve with the creation of the Programme Boards.

**SOVEREIGNTY**

24. There are many areas of military capability where it is vital that the UK maintains an on-shore, strategic EW capability. This is not about jobs for the UK; rather, it is about the UK retaining independent control of vital platform capability. Various issues must be taken into account, including both short and long-term affordability, supportability, exportability and insertion of new and improved capabilities and technologies.

25. We believe that it is vital to maintain and develop the UK’s scientific and technological (industrial) capability. Lack of UK MoD business means industry will concentrate on export opportunities where the requirements may not be aligned with those of the UK Armed Forces. The other danger is a loss of relevant skills and facilities. Electronic Warfare expertise is a strategic capability, highlighted in the Defence Industrial Strategy, that once lost will prove very difficult to recover. Without a coherent approach to DAS fits in the future, this strategic capability is at risk.
CONCLUSIONS AND RECOMMENDATIONS

26. It has been recognised that DAS coherency has the capability to provide substantial cost savings. These would be realised though commonality in a number of areas, including technology and capability development, equipment qualification, validation & verification, training, equipment & mission support, the MoD support infrastructure, capability enhancement, procurement and programme management. It should also be recognised that DAS coherency is fundamental to retaining a strategic capability within the UK.

27. A coherent approach to the purchase and support of Helicopter DAS would:
   — Save money
   — Lead to better solutions
   — Assure long term sovereign capability
   — Assure industrial commitment to the UK

28. To date the coherent approach has only been partially implemented. To get full benefits of coherency, MoD needs to adopt a different procurement approach. One approach would be for the MoD to negotiate with potential suppliers at an early stage in order to get cross-platform coherency. The results of such negotiation might be, for example, the appointment of a cross-platform DAS system prime, or architecture lead. Working with MoD, this lead would then be responsible for:
   — competing sensors and countermeasure components at the appropriate level, either across platforms or for individual platform types
   — technology insertion and capability growth

29. All parties in the procurement chain, including MoD, Primes and Suppliers, would need to be bought in. It seems likely that a different skillset would be required to negotiate the best deal for UK. IPTs and Platform Primes, in particular, would need encouragement to take a wider, sustainable view of procurement and support.

3 April 2009

Annex 1

ABSTRACT FROM INTERNATIONAL DEFENCE REVIEW

1 December 2007

Attack helicopters adapt their role for the asymmetric battlefield. By Rupert Pengelley

One difference in tactics is that the pilots of UK Apaches are generally content to operate above the small-arms threat, having, as Lt Col McGinty puts it, “a high degree of confidence in the level of technical protection provided against surface-to-air missiles” by the Apache AH.1’s Selex HIDAS integrated defensive aids suite (DAS).

ABSTRACT FROM INTERNATIONAL DEFENCE REVIEW

1st February, 2007

UK Apache proves itself in Afghan service. By Joris Janssen Lok

In answer to a question about the differences between the operating methods of British Apache units and Dutch or US units operating the AH-64D, Jane’s was told that the AH.1 was likely to be flown at a higher altitude. Because of the AH.1’s HIDAS defensive aids suite (which is integrated and not a bolt-on solution) and its superior flare capability, “we can afford to fly higher because we are less worried about surviving a surface-to-air missile attack than our opposite numbers”.

Memorandum from Eurocopter

INTRODUCTION

1. Eurocopter Group (ECG), a wholly owned subsidiary of European Aeronautics, Defence and Space Company (EADS), is the world’s largest manufacturer of helicopters. It was formed in 1992 by the merger of Aerospatiale Helicoptères of France and MBB of Germany: in 2006 a third “home” country, Eurocopter España, joined the Group. On a historical note, in 1965 the United Kingdom and France signed a MOU, jointly to develop between Westland and Aerospatiale, the Puma, Lynx and Gazelle family of helicopters, arguably the most successful European collaborative venture of recent years, as all three types are all still in service with the UK, France and many other nations.

2. In 2008, ECG delivered 588, and took orders for 715 helicopters from both military and commercial customers, in roughly equal proportions: this military/civil mix provides a sound foundation to the Group’s business model. Revenues were €4.5 billion, having risen steadily from €2.6 billion in 2003. The Group’s design and manufacturing capability is complemented by a major support and services operation,
accounting for over one third of turnover. In military sales it shares the world market with other European, American and Russian manufacturers, but it consistently dominates the civil and “parapublic” (police and emergency services) markets with over 50% of world sales.

3. With a workforce of 14,000, the Group’s headquarters and principal manufacturing facility is at Marignane, near Marseille, where it is led by a German Chief Executive Officer, Dr Lutz Bertling. Development and production are also conducted at sites in Donauwörth, near Munich, at Albacete in Spain, and at other sites including major production facilities in the USA and Australia.

4. Eurocopter’s product range covers the full range of single and multi-engine helicopters and includes the EC225/725 Super Puma/Cougar, NH90 and Tiger, AS365 Dauphin, the EC145 and 135 family, EC120 Colibri and AS350 Squirrel; variants of all types are used by both military and commercial customers. There are currently over 10,000 ECG helicopters flying around the world with over 2,500 customers, covering the full range from major defence and oil-and-gas fleets through to private owners. The Group has 20 subsidiaries around the world, with a particularly strong presence in Europe, North America and South East Asia, with markets outside France, Germany and Spain generating over 50% of turnover.

5. The support and services operations complement the design, development and manufacturing activities by offering customisation/completion, maintenance, repair and overhaul, retrofits and upgrades, technical support, flight testing, certification, training and logistics. Sales and support in the defence sector is a critical feature of our operations globally, and Eurocopter products are flown by the Armed Forces of many nations, including most NATO nations.

UK PRESENCE

6. The UK is a very important market for Eurocopter, with over 400 of our civil and military helicopters in service here.

7. In the defence sector, Pumas are flown by the Royal Air Force and based at RAF Benson and RAF Aldergrove; the current fleet comprises 44 aircraft. Approximately 40 Gazelles remain in service with the Army Air Corps in 5 Regt AAC and other units. The last component of the current defence fleet is the AS350 Squirrel, 38 of which are in operation at the Defence Helicopter Flying School.

8. Within the UK commercial and parapublic fleets, 42% are EC aircraft, while in the combined UK/Ireland market, Eurocopter accounts for over 50% of corporate/VIP helicopters, with 75% of the Emergency Medical Services sector and 80% of the UK’s Police forces.

9. The importance of the United Kingdom to Eurocopter was demonstrated most clearly by its acquisition in December 2007 of McAlpine Helicopters Ltd (MHL), ECG having previously held a minority share in the company. MHL had been EC’s UK and Ireland distributor since 1977. EC UK has 200 employees and its strategy is to grow, particularly in the defence sector, with a specific aim to create a National Support Centre for all marks of Puma. Turnover has increased steadily, reaching £78 million in 2008.

10. Eurocopter has operations throughout the UK and Ireland. With the highest concentration of skilled engineers, EC’s Oxford HQ is its UK Technology Hub. A team near Bristol handles the Puma Life Extension Programme (LEP). Personnel are also detached to RAF Benson, and to Bedford, Belfast and Newcastle, with additional sites at Hawarden and Dublin. A major investment at Aberdeen will start in April this year, to cater for the vital offshore oil and gas market, currently served by some 59 Super Pumas, flying 85,000 hours annually.

11. The decision to acquire MHL could in part be traced to the 2005 Defence Industrial Strategy (DIS), which made clear that a UK footprint was a requirement for success in the defence sector. In respect of helicopters, the DIS sought to establish a closer and more transparent relationship with the industrial sector, with particular emphasis on the forging of partnerships, reflecting the sector’s well-established position in, and importance to the UK.

12. DIS identified several critical capabilities for which sovereign capability should be retained/developed: (i) integration of platforms, powerplant, navigation and communications systems, complex integration of mission systems; sensors and processors; and capacity for modelling and simulation. On mission systems alone, EC UK’s dominance of the Police market flows from its development and integration of advanced, bespoke mission systems, of which the recently delivered Metropolitan Police EC145s are the latest example.

13. The DIS section on helicopters tended to focus on AgustaWestland, reflecting amongst other things its Design Authority (DA) status in respect of the Lynx and Sea King. Consistent with this, AgustaWestland is the only helicopter manufacturer with which the MoD has to date established a Strategic Partnering Arrangement. However, in view of EC’s status as DA on Puma and Gazelle, and its planned role as prime contractor for Puma Life Extension, EC and MoD are jointly developing a Partnering Framework Arrangement.
CURRENT PROCUREMENT ISSUES

14. EC is engaged with the MoD on two main programmes relating to the Puma fleet, Through Life Support (TLS), and the Puma Life Extension Programme (LEP).

15. Last December, EC and MoD signed a TLS contract under which EC provides logistical support for the Puma fleet, providing a wrap-around spares and repair and overhaul service similar to the Integrated Operational Support solutions which are now standard for other MoD helicopter types.

16. Puma LEP is in negotiation, and will be EC’s most significant programme with MoD for many years. EC is currently conducting the Assessment Phase and is refining the details for the 5-year “Demonstration and Manufacture” (production) phase, for which a contract is expected within weeks.

17. LEP is critical because it addresses MoD’s most pressing helicopter shortfall, namely for battlefield lift that can operate in support of UK forces in the harshest and most demanding operating environments—notably Afghanistan. LEP will deliver a Puma Mk2 whose performance will exceed most other helicopters, and is the most cost-effective means of meeting MoD’s short to medium term helicopter needs. The Mk2 will offer at least 10 years’ additional service, and be capable of performing a year-round role in any theatre, in all climatic conditions. Comparable new aircraft would be significantly more costly, and could not be built by the time the current Puma Mk1 reaches its out-of-service date (OSD) in 2012. Lastly, UK-specific elements of LEP such as secure communications will be integrated in the United Kingdom at EC UK, thereby satisfying the DIS criteria for an onshore capability for upgrades and urgent requirements.

18. In addition to the Puma programmes, EC UK is supplying additional equipment to the MoD, details of which are being made available separately to the Clerk.

FUTURE REQUIREMENTS

19. Eurocopter is confident that its developing relationship with MoD will raise awareness of its potential as a partner on various important programmes planned in the short to medium term.

20. On the Search and Rescue Helicopter (SAR (H)) programme, to be contracted jointly by MoD and DIT/Maritime and Coastguard Agency, the EC225, the latest version of the Super Puma family, is the chosen platform for the Air Knight consortium. The military version, the EC 725, will be a strong contender for the forthcoming Future Medium Helicopter Programme.

21. ECG already provides most of the helicopters at the Defence Helicopter Flying School, and is participating in the early stages of the Military Flight Training System (Rotary Wing) programme to provide a successor to the DHFS contract.

CONCLUSION

22. Eurocopter strongly believes that the capability demonstrated in this submission—its status as the world’s leading helicopter manufacturer, its comprehensive support organisation and aircraft modification capability, underpinned by a growing onshore capability with Eurocopter UK Ltd, confirms its suitability as a partner to HMG and as an alternative supplier of helicopter capability.

3 April 2009

Memorandum from The Boeing Company

GENERAL INFORMATION

1. Boeing is the world’s leading aerospace company and the largest manufacturer of commercial jetliners and military aircraft, with capabilities in rotorcraft, electronic and defence systems, missiles, satellites, launch vehicles and advanced information and communication systems. Headquartered in Chicago, Illinois, U.S.A., Boeing employs more than 160,000 people in more than 70 countries.

2. With around 600 employees in the UK Boeing has a long standing relationship dating back over 70 years. Boeing’s annual spend in the aerospace industry supports thousands of jobs around the UK, in the process generating intellectual property and facilitating exports.

3. The Boeing Company also has an extensive network of industrial and academic partners and suppliers across the UK. Boeing works with a number of universities in the UK and has established multi-year collaborative research and technology relationships with several including Cambridge, Cranfield and Sheffield.

4. A subsidiary of The Boeing Company and a business unit of Boeing’s Integrated Defence Systems, Boeing Defence UK Ltd. currently has employees at 20 locations throughout the UK supporting Ministry of Defence (MoD) and U.S. military programmes. Boeing Defence UK is strengthening its ability to accommodate future business growth having invested in new facilities and technologies particularly in the systems engineering, sustainment and modelling and simulation domains.
5. As a system-of-systems integrator, Boeing Defence UK is positioned to support through-life system-of-systems programme management of complex defence programmes. Along with engineering and integration, as an integrator Boeing Defence UK delivers through-life capability management, through-life technology management, alliance development and supply chain management.

6. One such way Boeing Defence UK is delivering capability is through the company’s Analysis, Modelling & Simulation facility, The Portal, located in Farnborough with partner QinetiQ. The Portal enables future military hardware and software solutions to be assessed in a variety of operational environments. Comprised of personnel from Boeing Defence UK and QinetiQ, The Portal is tasked with providing a robust experimental architecture including a realistic scenario, detailed mission briefs and, most importantly, a rigorous analysis plan.

7. Delivery of military capability is a cornerstone of business for Boeing Defence UK. Boeing’s extensive capabilities can be seen in the variety of platforms that are continually enhancing the operational effectiveness of the UK armed forces. From the C-17 Globemaster III transport aircraft and the heavy-lift capability of the Chinook, to the Apache AH MK1 attack helicopter, Boeing platforms, and the services provided to support these and other platforms, are making a major contribution to the frontline.

**Chinook**

8. Boeing originally introduced the Chinook in 1962, and the first models served in the Vietnam War. Since their introduction, new models have been produced, and further upgrades are planned to extend the Chinook helicopter’s service life beyond 2030. The Chinook is therefore the longest running continual production programme in The Boeing Company.

9. Chinooks have since served around the world, both during conflicts, and increasingly on humanitarian missions such as medical, disaster relief, search and rescue, fire fighting, and civil development. The helicopters are under licensed production by Agusta of Italy and Kawasaki in Japan with aircraft built by Agusta having been exported to Egypt, Greece, Iran, Libya and Morocco.

10. The RAF operates the third largest fleet of Chinook support helicopters. The Chinook Wing, which forms the heavy-lift element of the Joint Helicopter Command, is based at RAF Odiham in Hampshire. The Chinooks can carry 10 tonnes of freight or 54 troops, as well as underslung loads, and the cabin is large enough to accommodate two Land Rovers. RAF Chinooks are also used in Search and Rescue and Casualty Evacuation, and can carry a total of 24 stretchers. The aircraft has an unsurpassed “hot and high” capability making it particularly well suited to operations in Afghanistan.

**UK Chinook—Through Life Customer Support Programme**

11. **Description & Purpose:** The UK Chinook Through Life Customer Support (TLCS) programme is a performance-based logistics agreement with the UK Ministry of Defence, Defence Equipment & Support (DE&S) organisation that provides heavy maintenance, engineering technical support, supply chain management including spares forecasting and procurement, aircraft and component repairs, publications management, and modification services for the UK’s fleet of 40 Mk2/2a Chinook helicopters.

12. The UK Chinook TLCS programme guarantees to provide 27 aircraft available on a daily basis. Out of those aircraft, Boeing has exceeded serviceability goals with greater than 95 percent serviceable and ready to support RAF operations. Boeing has partnered with Vector Aerospace (formerly, the UK MoD Defence Aviation and Repair Agency) to capitalize on local resources while infusing Boeing technical and lean expertise into UK Chinook operations to improve the helicopter fleet’s readiness while reducing costs.

13. **Customer:** The UK Chinook Integrated Product Team (CHIP) is based at RNAS Yeovilton in southwest England. The contract or “Partnering Agreement” with Boeing is through 2040, with pricing negotiated in five-year increments. Boeing and the CHIP also have aspirations to grow the TLCS scope to include engines and avionics making Boeing TLCS the single point of accountability.

14. **Strategic Value:** TLCS is the first major international, direct commercial sale, performance-based-logistics programme for Boeing Global Services & Support. The MoD is using TLCS as a benchmark for future performance-based support contracts. Boeing’s TLCS performance will be considered in future platform acquisitions as well as expansion for AH-64 Apache FSA, and other future support programs. TLCS is also being watched by the Netherlands and Canada for their prospective Chinook support programmes. Boeing is also promoting this type of support approach for the US Army Chinook fleet.

15. **Performance/Key Milestones:** Boeing has exceeded programme serviceability (mission capability) and aircraft availability goals for the last 13 months. Boeing assumed full supply chain responsibility for the UK Chinooks on 17 October 2007. On 14 December 2007 Boeing and representatives from the United Kingdom’s Ministry of Defence signed a $115 million contract to reconfigure eight Mk3 Chinook helicopters to current Mk2 flight standards. As the MK3 aircraft enter service in 2009, they will also be supported under the TLCS programme.
16. **Apache Integrated Operational Support (AIOS)** is a similar PBL programme developed specifically for the UK Apache attack helicopter fleet. Boeing Defence UK is supporting the evaluation of AIOS alongside its current support contracts with AgustaWestland. The partnership experienced on programmes such as Apache and Chinook and capabilities such as The Portal is not only critical to Boeing's success but to the success of the customer.

**CONCLUSION**

17. In the words of the Committee’s terms of reference, this submission has sought to provide information on current procurement and maintenance projects and in particular, the UK Chinook Through Life Customer Support (TLCS) programme. TLCS has been a very effective way of providing performance-based support for the UK Chinook fleet and is being reviewed as a model for future performance support programmes.

3 April 2009

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**Memorandum from SBAC (Society of British Aerospace Companies)**

**INTRODUCTION**

1.1 SBAC is the UK’s national trade association representing companies supplying civil air transport, aerospace defence, security and space markets. SBAC encompasses the British Aviation Group and UKspace. Together with its regional partners, SBAC represents 3,000 companies across the UK supply chain.

1.2 Aerospace is one of the few successful and globally competitive manufacturing sectors of the UK economy, with a turnover of £19.8 billion in 2008. The aviation sector in the same year contributed £15 billion to UK GDP, accounting for 1.1% of the overall economy. The aviation industry supports 700,000 jobs.

(A) **The current and future size and structure of the helicopter fleet.**

2.1 The current fleet of helicopters operated by the UK's armed forces stands at 524 aircraft (excluding aircraft leased by the forces) and consists of Lynx, Merlin, Sea King, Chinook, Puma, Gazelle and Apache aircraft. The Joint Helicopter Command (JHC), formed in 1999 operates the battlefield helicopter resources of the three military Services under a single command with the intent to provide a flexible and potent helicopter capability. The Royal Navy continues to retain its own maritime orientated helicopters primarily for the protection of its surface fleet. UK Search and Rescue also sits outside of the JHC and is co-ordinated by the RAF from the Air Rescue Coordination Centre at RAF Kinloss.

2.2 The aerospace industry in the UK is both the major supplier of and provider of support to helicopters operated by the UK armed forces. AgustaWestland is the largest rotorcraft manufacturing and support company in the UK and in 2007, EADS/Eurocopter acquired McAlpine Helicopters Limited to form Eurocopter UK. Many UK companies are an important part of the supply chain with companies such as Rolls-Royce, QinetiQ, Lockheed Martin UK and Cobham playing a major role in maintaining and upgrading helicopters.

2.3 Commanders in the Armed Forces often claim that they do not have sufficient helicopters, industry shares this concern and is also concerned that the existing fleet provides the wrong sort of capability. Prior to the creation of the JHC helicopters for the armed forces were largely procured according to individual services requirements. They were also procured according to the challenges presented by the Cold War. The change through the 1990s and since 2000 in the typical operating theatre means that increasingly machinery has to operate in very hot temperatures, and sometimes at very high altitudes. There is also increasingly a need for helicopters to carry large payloads over large distances. It is highly unlikely that these demands will decrease in the future. Flexibility should be prized in order that in future helicopters are procured which are able to perform a multitude of tasks across the three services.

(B) **Current procurement and maintenance projects**

3.1 Presently the Armed Forces operate some ten different helicopter types. A fleet which consists of a wide variety of aircraft is likely to incur significant costs in terms of maintenance and support. A more standardised fleet maximises value for money and introduces broad cost savings across all the lines of development.

3.2 The system of Integrated Operational Support (IOS) for helicopters has been developed jointly by AgustaWestland and the MoD over the last five years and has has resulted in more cost effective maintenance for the MoD as industry is incentivised to achieve high levels of aircraft availability and fixed maintenance costs, with more of the risk being taken on by industry. The central role of partnering to improve the predictability of maintenance and reduce support costs was a cornerstone of the Strategic Partnering Arrangement signed by AgustaWestland and MoD in 2006, the SPA itself being an outcome of MoD’s Defence Industrial Strategy published in 2005.
3.3 Maintenance contracts such as the Integrated Merlin Operational Support (IMOS) arrangement are examples of agreements which place the emphasis on value for money. The contract terms are such that industry is rewarded for the number of flying hours the helicopters in question are able to carry out. This contributes to a better product for the forces and ensures that wherever possible, the maximum capability is made available.

3.4 Partnering between MoD and industry increases the potential for successful strategic planning going forward. SBAC believes that there are also opportunities for closer links between civil and defence R&D, which would maximise value for money.

3.5 The competition for the Future Medium Helicopter (FMH) is likely to represent the single largest MoD procurement of helicopters over the next decade. This will be an international competition for up to 70 medium class helicopters, typically between eight and 15 tonnes in all-up weight.

3.6 As with many airborne vehicles the civil and the military aspects should not be viewed in isolation. Many of the distinctions between civil and military technology are blurred, for example many helicopters in use with the military are used as transport helicopters in the civil sector. Much of the technology in engine, rotor blade and airframes are dual use across both sectors.

3.7 There is also significant export potential generated, with aircraft such as the Lynx and Merlin, now widely recognised as some of the best of their kind and as such are successfully exported.

(C) The role played by helicopters on current operations

4.1 The unique capabilities of helicopters are highly prized by armed forces across the globe. The role of the helicopter in combat scenarios has changed little since it was first employed, but broadly includes reconnaissance, medical evacuation, direction of fire in support of ground troops and are also frequently used by special forces.

4.2 This range of capabilities is an excellent example of the value that helicopters can bring on the battlefield. The cost of helicopters should not be taken just in terms of procurement and maintenance costs but also the flexibility they provide for the Armed Forces.

(D) The support structure underpinning helicopter operations

5.1 The support that industry provides to the armed forces is vital in relieving pressure on them and allowing them to focus on operations. The support is not just in the form of maintenance on the assets themselves, but also in training on new and updated platforms.

5.2 The Joint Modification Service was set up in 2008, To improve the planning and delivery of urgent aircraft modifications to the front line. To date, some 490 modifications have taken place since its launch. SBAC recommends that this activity is given priority so that the capacity in the supply chain is used most effectively. On the whole though this should be seen as a positive example of MoD and industry working together to save time and money and deliver improved capability to the front line.

5.3 Since the first IOS contract was signed in 2005 much more responsibility has passed to industry. Under the terms of an IOS agreement the MoD sets a defined number of flying hours required and industry is required to provide the necessary number of aircraft to perform to that extent. The companies involved in the IOS contract are paid according to flying hours achieved and it is therefore in their best interests to maximise flying time and minimise faults in the aircraft—this in turn results in more consistently effective equipment for troops on the front line.

(E) Summary

6.1 UK industry plays an important role in keeping the helicopter fleeting operating. Helicopters offer unparalleled assistance and versatility on the battlefield and their contribution to operations should not be underestimated.

6.2 A reduction in the number of different helicopter types would save money across the board. At present there are 10 helicopter variants in service which will incur considerable costs because of the variety of spare parts required to sustain such a fleet.

6.3 Greater synergy between civil and military R&D, as well as long term commitment to R&D investment will help to drive costs down.

6.4 Close long-term partnerships between industry and MoD have delivered cost savings and will continue to do so in the future, as industry has an incentive to provide airworthy helicopters for as many flying hours as the forces demand.

6.5 Industry has a vital role to play in training the forces on new systems and upgrades to existing systems as well as the maintenance of aircraft.

9 April 2009
Memorandum from the Royal Aeronautical Society

SUMMARY

— The helicopter is one of the most versatile and ubiquitous of military platforms and plays a particularly vital role in counter-insurgency warfare where UK armed forces are deployed in ungoverned space and in difficult terrain.

— Helicopters are vital force-multipliers. Theatre forces without the tempo, mobility and reach provided by helicopters are likely to have to be larger to achieve the same aims and would operate at a higher level of risk.

— There is a risk of procuring a number of different types of helicopters to meet a wide range of different tasks. The most affordable approach would be to optimize helicopter types across a number of roles thereby minimizing the number of fleets involved, paying particular attention to commonality of mission systems and defensive aids suites.

— Uncertainty over the future direction of MoD procurement is creating difficulties for UK industry in meeting the needs of UK armed forces. There is too great a reliance on UORs and there is a clear need for MoD to prioritise its requirements and be prepared to take some risk against the Defence Planning Assumptions.

— Overall, the partnering agreements between the Ministry and industry have been a success. The approach has resulted in more cost effective maintenance for the MoD centring on the integrated operational support (IOS) concept. But there seems to be growing ambiguity since the 2005 publication of the Defence Industrial Strategy over the MoD’s interpretation of partnering agreements.

— There is a specific issue in relation to self-protection of helicopter forces; the approach remains piecemeal and lacks a coherent over-arching strategy that recognises the importance of Electronic Warfare to modern theatres such as Afghanistan and the requirement to preserve on-shore the intellectual property and operational sovereignty in an area vital to self-protection.

INTRODUCTION

1. The Royal Aeronautical Society (RAeS) is the Learned Society for the Aerospace and Aviation community. Based in London, it has a worldwide membership of over 19,000, with over 13,000 in the UK. Its Fellows and Members represent all levels of the aeronautical community both active and retired with around a half of these as professional engineers. In addition, the Society has over 120 organisations that are members of its Corporate Partners scheme. It has Airpower and Rotary Specialist Groups, with members drawn from industry, academia and the Armed Services.

THE IMPORTANCE OF THE HELICOPTER

2. The helicopter, in all of its variants, has proven to be one of the most versatile and ubiquitous of military platforms. From its early roles in medical evacuation and tactical transport, the helicopter has evolved into a formidable offensive aircraft, as well as emerging as a powerful element in the provision of tactical heavy lift. The helicopter also plays an important role in para-military operations such as maritime search and rescue. The history of recent engagements by UK military forces suggests that there are never quite enough aircraft to fulfill all of the varied demands placed on the helicopter force, whether operated by Army, RAF or Royal Naval personnel. In the UK, this is supported by a world-class industrial capability centred on AgustaWestland and a history of substantial public and private sector investment in rotary-wing technology.

THE ROLE PLAYED BY HELICOPTERS ON CURRENT OPERATIONS IN IRAQ AND AFGHANISTAN

3. There are four distinct but overlapping helicopter roles in the type of counter-insurgency battlespace represented by Iraq and Afghanistan or, in the future, any other theatre represented by ungoverned space. In ascending order of operational capability requirements, these are as follows.

(a) The sheer difficulty of surface transportation of personnel and material represented by challenging terrain, poor infrastructure and adverse climate makes heavy demands on airlift. Where runways are not available, helicopter lift is the only option as it is for the re-supply of small, remote enclaves.

(b) In terms of force protection, helicopter movement of personnel in contested battlespace provides one of the few ways by which to guarantee safety in the light of insurgents’ use of roadside improvised explosive devices. The same situation arose in Northern Ireland in the 1970s because of the IRA’s tactical dominance of the ground where the Army needed to operate.

(c) Attack helicopters are called-on to provide Close Air Support to troops in contact with the enemy.

(d) Helicopters are required to penetrate tactically hostile ground, often during the conduct of a firefight, to recover wounded personnel or deliver reinforcements. This latter task is time critical and thus has to be conducted in all weathers, potentially at night, regardless of the related environmental conditions where zero visibility due to brown-out is often encountered.
4. Each of these roles also simultaneously contributes to the ISTAR task and, on occasions, only helicopter reconnaissance can resolve the ambiguity inherent in complex battlespace. Taken together, helicopters are vital force-multipliers. Theatre forces without the tempo, mobility and reach provided by helicopters are likely to have to be larger to achieve the same aims and would operate at a higher level of risk. This omits mention of important maritime roles in antisubmarine warfare, anti-surface warfare, maritime ISTAR and search and rescue at sea. That said, there are dangers in assuming that a helicopter is the default option for all theatre tasks. In terms of basic airlift, it is also important to recognize that, in situations where even short runways or tactical landing strips are available, light fixed wing turbo-prop aircraft have a place in the force mix. For example, the C-27J Spartan now selected for the US Army and the USAF as the Joint Cargo Aircraft operating on a triangular tactical route of typical theatre distances of a total of 600 miles costs only 12% of that of a Chinook performing the same task with the same payload. This approach also releases valuable helicopter lift for more specialist tasks.

5. The nature and variety of the land warfare roles defines the characteristics of the helicopters concerned in terms of lift carrying capacity, maneuverability, the ability to withstand battle damage, electronic self-protection, firepower, sensor performance and night vision capability. In seeking to meet the full spectrum of roles, there would, therefore, be a danger of creating an acquisition policy based on a number of small fleets each optimized for its specialist role. In expeditionary operations, this approach would place a heavy burden on logistic support, training and UOR development. However, it is also true that one helicopter can only be in one place at any one time so a reduction in total numbers of helicopters deployed represents a dilemma for a field commander. The alternative more affordable approach would be to optimize helicopter types across a number of roles thereby minimizing the number of fleets involved, paying particular attention to commonality of mission systems and defensive aids suites.

CURRENT AND FUTURE SIZE AND STRUCTURE OF THE UK HELICOPTER FLEET

6. The UK helicopter fleet has grown in a piecemeal way from legacy platforms. There are now some 10 types in service, mainly configured in small fleets that have been extensively modified. This approach is costly in terms of maintenance, obsolescence management, training and capability upgrade.

7. In seeking to address this problem, the UK’s helicopter strategy was jeopardised with the removal of £1.3 billion from the associated programmes in the Medium Term Workstands associated with the 2005 Equipment Programme. Continued uncertainty over the strategy, particularly over the Future Medium Lift helicopter, places doubt on the UK’s ability to optimise its helicopter capability across fewer, more modern types. The future programme already envisages Future Lynx, re-lifing of the legacy Sea King and Puma fleets, the UK’s Search and Rescue helicopter replacement, and the Future Medium Lift competition. It is not clear that this approach is affordable.

8. In line with the Defence Industrial Strategy, industry needs clarity of intent on the relative priority and costs likely to be afforded to each element of the programme. In addition a stronger focus for a coherent tri-service helicopter strategy enmeshed by a single senior (four-star) point of contact within the UK MoD (as is the case for fixed-wing fast-jet aircraft) is necessary. As it stands, helicopter operational capability is heavily reliant on UORs. Taking AgustaWestland as an example, the company has embodied 63 UORs in the UK helicopter fleet over the last five years. The equivalent figures for the first Gulf War and the Falklands War were three and one respectively. Overall, there is a clear need for MoD to prioritise its requirements and be prepared to take some risk against the Defence Planning Assumptions.

CURRENT PROCUREMENT AND MAINTENANCE PROJECTS

9. The Defence Industrial Strategy and the Strategic Partnering Agreement (SPA) in 2006 with AgustaWestland now provides an example of the way in which joint MoD-industry planning and maintenance activity is optimising availability of the UK’s helicopter fleets. This has resulted in more cost effective maintenance for the MoD centring on the integrated operational support (IOS) concept. Under this regime, AgustaWestland is incentivised to achieve high levels of aircraft availability and fixed maintenance costs, with more of the risk being taken on by industry than in the past. It also means that industry has to be willing to absorb the risk inherent if past MoD practice has embraced economies in aircraft maintenance or husbandry.

10. Partnering also extends to the acquisition of new platforms. In the case of the Future Lynx helicopter, AgustaWestland adjusted the required funding profile to match the MoD resources available thus taking on additional financial risk. A similar partnering approach is being applied to incremental capability upgrade to existing helicopters where these offer significant performance advantages at low risk. Recent examples are the integration of the Modernised Target Acquisition and Designation System (MTADS) to the Apache and Carson rotor blades to the Sea King. In this latter case, the flexibility of the arrangement allowed the MoD to specify a rotor blade manufactured by a competitor to be fitted under the IOS process. In spite of these successes, there seems to be growing ambiguity since the 2005 publication of the Defence Industrial Strategy over the MoD’s interpretation of partnering.
The Support Structure Underpinning Helicopter Operations

11. In terms of self-protection, situational awareness and lethality, there is much commonality between fixed-wing fast-jet aircraft and helicopters in the way these elements of capability are generated. As an example, SELEX Galileo has collaborated with the MoD to develop the integrated suites of defensive aids equipments that provide a superior level of self-protection for platforms operating in the most hostile environments. Drawing on their long history in fixed-wing combat aircraft systems, they have applied the development of this technology to helicopters, particularly in the HIDAS self-protection suite for the UK’s the Apache AH Mk1 Attack Helicopter.

12. The efficacy of this system has been operationally proven in Afghanistan and enjoys a high level of crew confidence. As a result, the company funded a series of studies into the cost benefits of a holistic approach to the provision and support of Defensive Aids across the UK helicopter fleet leading to an initiative known as DAS Coherency. This offers the advantages of a cost effective route to enhanced operational capability by adopting a “fitted for—not with” philosophy, generating larger production runs and hence economies of scale, savings in Through Life Cost, and better exploitation of investment. This concept was applied to the Future Lynx programme resulting in the same DAS architecture as UK Apache, and common equipment fit with other UK helicopters. This, in turn, yields a common requirement for mission support, logistics and training. However, the approach remains piecemeal and lacks a coherent overarching strategy that recognises the importance of Electronic Warfare to modern theatres such as Afghanistan and the requirement to preserve on-shore the intellectual property and operational sovereignty in an area vital to self-protection.

Final Observations

13. The UK military helicopter fleet makes a vital contribution to a wide range of military operations, especially in counter insurgency contexts. There is evidence that this fleet is overstretched and resources allocated to helicopter maintaining this capability now and in the future are shrinking. The Society is also concerned at the apparent absence of a “helicopter” champion in the MoD able to impose a higher level of coherence on fleet procurement and management. Finally, the Society is concerned that ambiguity in the Defence Industrial Strategy and associated Defence Technology Strategy might lead to a long term erosion of the UK’s rotorcraft defence technological and industrial base.

2 April 2009

Memorandum from Vector Aerospace International Limited

Executive Summary

1. The Vector Aerospace Corporation is a maintenance, repair and overhaul business that serves the civil and military aerospace market worldwide.

2. Vector Aerospace International Limited (VAIL) has now been operating for just over 12 months in the UK, since the acquisition on 1 April 2008 by the Vector Aerospace Corporation, of the legacy Defence Aviation Repair Agency (DARA) helicopter and components support businesses.

3. The three primary programmes undertaken in the UK are in support of the Chinook, Lynx and Sea King fleets. These are supported by Vector’s Helicopter Services business at Fleetlands, Gosport and its Component Services business at Almondbank, Perth. Lynx support is contracted directly to Defence Equipment & Support (DE&S), through their Lynx Project Team. Chinook support is contracted through Boeing, under the Through Life Customer Support (TLCS) Programme. Sea King support is contracted through AgustaWestland, under the Sea King Integrated Operational Support (SKIOS) Programme.

4. VAIL has achieved a successful first year of operations, delivering against its commitments and being awarded various accolades, including a commendation from the Commander Joint Helicopter Command (JHC), in recognition of its partnered support with Boeing to the Chinook fleet. Also, its Component Services business was one of only three companies outside the USA to receive the Boeing Gold Supplier Award for its performance from September 2007 to September 2008.

5. VAIL is investing for the future, seeking to grow its UK military business through partnered support solutions with AgustaWestland and Boeing and other OEMs.

6. Vector Aerospace believes that it offers some key benefits to the MoD in support of helicopter capability, in terms of:
(a) Independent status.
(b) Retention of specialist maintenance facilities that safeguards the skills and know-how to offer long-term, onshore support for helicopters and their engines and components.
(c) Flexibility and agility to operate in different support scenarios and geographic locations, for all of the UK MoD helicopter types.
(d) Ability to draw on its global experience of helicopter, components and engines maintenance.
INTRODUCTION

About Vector Aerospace

7. Vector Aerospace Corporation is an independent provider of maintenance, repair and overhaul (MRO) services for fixed-wing and rotary-wing aircraft operators around the globe. Vector’s service portfolio includes support for various types of engines, dynamic components, structures and avionics. From facilities in Canada, the United States, the United Kingdom and South Africa, Vector’s employees serve a global customer base consisting of private and commercial operators, government agencies and defence departments.

8. Vector holds approvals from some of the world’s leading OEMs, including Boeing, AgustaWestland, Sikorsky, Rolls Royce, Eurocopter, Pratt & Whitney Canada, Bell Helicopters, General Electric, Turbomeca, Sagem Avionics, Rockwell Collins and many other manufacturers and suppliers.

Vector UK

9. Vector’s first footprint in the UK was in 1998, when Hunting Airmotive was acquired and subsequently became Sigma Aerospace. When the MoD decided to sell the helicopter and components deep repair elements of the former DARA, Vector expressed an interest. After a prolonged period of down selection, due diligence and negotiation, the sale to Vector of the helicopter business at Fleetlands and the components business at Almondbank was concluded on 1 April 2008. So, the Vector business in the UK is now made up of the following physical locations:

Vector Aerospace Helicopter Services—Fleetlands

10. Situated in Gosport, Hampshire and employing some 900 people. The three main programmes of work are:

(a) Chinook—The Through Life Customer Support (TLCS) contract to Boeing for depth maintenance of the RAF Chinook fleet.

(b) Lynx—An incentivised three-year contract directly with DE&S, with the option to extend to out of service date. This covers all marks of Lynx.

(c) Sea King—The Sea King Integrated Operational Support (SKIOS) contract through AgustaWestland for depth maintenance and support of all marks of Sea King.

Vector Aerospace Component Services—Almondbank

11. Situated close to Perth in Scotland and employing some 300 people. The principal programmes of work are:

(a) Chinook—Dynamic and hydraulic components in support of the TLCS contract to Boeing, for depth maintenance of the RAF Chinook fleet. In addition, work is carried out for several Chinook international customers, through Boeing.

(b) Lynx—A contract with AgustaWestland for deep maintenance of Lynx components. In addition, some Lynx structural and hydraulic components are supported through a contract directly with DE&S.

(c) Sea King—Dynamic and hydraulic components are maintained in support of the SKIOS contract with AgustaWestland for depth maintenance of the MoD Sea King fleet.

(d) Tornado—Support for Tornado gearboxes, through Rolls Royce Deutschland and Tornado hydraulic components, through BAE Systems and Claverham (Hamilton-Sundstrand).

12. These two legacy DARA businesses at Fleetlands and Almondbank now comprise a UK business entity known as Vector Aerospace International Limited (VAIL).

Vector Aerospace Engine Services—Croydon & Fleetlands

13. This is the first of the Vector businesses acquired in the UK and employs some 220 people. It conducts deep maintenance for a number of Rolls Royce engine types, including T56 (Hercules), Conway (VC10) and Dart. In addition, it supports Honeywell ALF 502/507 (BAE 146, including No 32 “The Royal Squadron”) engines and Dowty and Hamilton Sundstrand propellers. Full overhaul capability for the PW 307/308 engine series is being established at the Fleetlands location. Vector’s UK engines business currently supports no helicopter engines, but its well-established legacy of supporting MoD engines for 25 years has been of great “learning” benefit to the wider Vector business in the UK.
BACKGROUND INFORMATION

First year of operation

14. In its first year of operation (1 April 2008–31 March 2009), VAIL has:

(b) Been awarded a commendation by the Commander JHC, in recognition of excellence in Chinook support.
(c) Been awarded Boeing’s Gold Supplier Award for its Component Services performance from September 2007 to September 2008.
(d) Invested in re-instating engines capability at Fleetlands, which had been shut down by the MoD in 2007. The Honeywell ALF 502/LF507 engine line is in operation and full overhaul capability on the PW 307/308 engines will be achieved by mid 2009. (Neither of these engine types is installed in helicopters, but Vector does, subject to business case, intend to establish capability for appropriate helicopter engines in due course.)
(e) Provided Contractors on Deployed Operations (CONDO) support through Boeing, to RAF Chinook operations in Afghanistan; this is an ongoing operation.
(f) Provided a number of working parties for Sea King support, both overseas and in the UK.
(g) Completed the Lynx Defensive Aids Suite (DAS) and Theatre Entry Level modification programme of 44 aircraft in budget and within contracted time, in addition to routine deep maintenance programme.
(h) Recruited 19 apprentices in 2008 and is intending to recruit 19 this year.
(i) Continued to invest in developing its people and will continue delivering the appropriate training necessary to improve our standards of performance in Quality, Health and Safety and Environment, all of which are key to the future success of the business.

Key features of helicopter and components deep support provided by VAIL

15. VAIL is a UK deep maintenance, repair and overhaul provider. We can (and wish to) partner effectively and efficiently with OEMs such as AgustaWestland, Boeing and Rolls Royce, as we do not threaten their core manufacturing business. This has been demonstrated in the Boeing TLCS and AW SKIOS programmes. So whilst it is our strategic intention to strengthen our ties with the respective OEMs, our independence provides an additional level of safeguard to the MoD in terms of assuring an ongoing and dependable alternative on-shore MRO provider for helicopter deep support.

16. Our core business is depth maintenance and upgrade of helicopters, components and engines, ie we are different from the “managed service” manpower substitution agencies that adapt their offering/price to suit specific customer requirements, eg from grass cutting to equipment maintenance. We are investing in the capability and know how needed to continue offering a dependable, world class support service to the MoD. We are committed to this business for the long term. We shall continue to invest in the facilities and people, where there is a good business case (eg engines at Fleetlands), but that this relies on maintaining a critical mass of work.

17. Our future is only guaranteed by the quality and cost effectiveness of our output and through our involvement with a number of MoD programmes, we can allocate resources effectively to absorb peaks and troughs in demand, and to surge when required. We also have the ability to pursue international military and civil work, which strengthens our position as an established employer of skilled aerospace technicians.

18. We recognise the key dependency of an assured pool of highly qualified and well motivated aerospace technicians. To that end, we shall continue to invest in growing our own talent and attracting the best we can, to maintain our status. This is beneficial for the MoD and for the wider “UK plc”.

19. Although we operate primarily from three sites in the UK, we are not constrained to these physical locations. We are actively seeking new ways to support the MoD both in their UK main operating bases and also now in theatre, with the first CONDO deployment in support of RAF Chinook operations in Afghanistan.

20. Finally, we have the capability to offer a complete “one stop shop” service, including engine deep maintenance.
PROPOSED RECOMMENDATIONS

21. At this relatively early stage in our life, in support of UK MoD helicopters and components, Vector has no recommendations to offer to the Inquiry.

14 April 2009

EXECUTIVE SUMMARY

Memorandum from AgustaWestland

— A balanced fleet of helicopters on expeditionary operations saves both resources by adding mobility and thus reducing the overall force levels required and saves lives by reducing risk and providing a unique capability for the evacuation of casualties.

— Reducing the number of helicopter types in service would create savings across the lines of development.

— The Strategic Partnering Agreement between the MoD and AW is driving down costs of both procurement and support. There are more gains to be made if partnering is developed further.

— The Integrated Operational Support concept is improving the availability of aircraft and will, over time, further reduce the cost of ownership of MoD aircraft.

— Helicopter aircrew and maintainer training is an area where opportunities exist for greater innovation and savings to be made.

AGUSTA WESTLAND

1. AgustaWestland, a Finmeccanica company, is a world leader in the helicopter market. AgustaWestland has the technology required to undertake the design and development of helicopters and tiltrotors for civil and military use from the preliminary analysis and definition of operational requirements to the design, development and production of transmissions, rotors, metal and composite structures and avionics systems, as well as their integration into a complete “helicopter system”. The company also specialises in the provision of helicopter maintenance support and training services.

THE ROLE PLAYED BY HELICOPTERS ON OPERATIONS.

2. Over the last 50 years helicopters have changed the way the Armed Forces fight maritime and land operations. Although often perceived as expensive to procure and support, helicopters bring capabilities such as firepower, range and mobility, which enable the size of deployed expeditionary forces to be smaller than they would otherwise have to be. This is particularly the case in Afghanistan today where the distances are great and the terrain unforgiving.

3. A balanced mix of attack, light, medium and heavy lift helicopters gives force commanders greater flexibility and tactical options. Helicopters save lives by enabling troops to move beyond the threat of ground-based IEDs as well as the means to rapidly evacuate casualties from the front line. Therefore the cost effectiveness of helicopters should be viewed not simply in terms of platform and support costs but also against the wider savings of reduced overall force numbers, combat effectiveness and the saving of life and limb.

CURRENT AND FUTURE SIZE AND STRUCTURE OF THE UK HELICOPTER FLEET

4. There is still a significant degree of fragmentation across the UK’s helicopter fleet with some $10^4$ different types of helicopter in operational service (not including training). It is predicted that the overall MoD helicopter fleet numbers will reduce in the next decade. Operating many relatively small fleets of very UK bespoke helicopters is expensive in terms of support, training and modification costs. As these smaller fleets are extended into old age the MoD is likely to have to face increasing costs and safety risks due to obsolescence and fatigue. There are, therefore, likely to be broad cost savings across all the lines of development if the number of types in service is reduced.

CURRENT PROCUREMENT AND MAINTENANCE PROJECTS

5. The Defence Industrial Strategy of 2005 and the Strategic Partnering Agreement (SPA) signed by the MoD and AgustaWestland (AW) in 2006 now provides the basis for joint MoD/industry future planning and the maintenance of the UK’s legacy fleet. This has resulted in more cost effective maintenance for the MoD based around the Integrated Operational Support (IOS) concept, where AW is incentivised to achieve high levels of aircraft availability and fixed maintenance costs with more of the risk being taken on by industry than ever before. The Sea King and Merlin IOS contracts were approved by the MoD only after savings of greater than 10% and 20% respectively was demonstrated. Proof of the benefit of these contracts

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4 Lynx (4 marks), Merlin (2), Apache, Chinook (2), Puma, Sea King (5), Bell 412/212 (2), Gazelle, Dauphin, AW109.
5 The average fleet size in 2009 of the top 8 types/marks is around 50. This average figure is likely to reduce.
is being demonstrated today where the Merlin IMOS contract is taking corrective action on the RN Merlins where corrosion has occurred with no extra cost to the MoD. Prior to the IMOS contract the MoD would have had to fund all of this additional activity. Industry has also demonstrated it is prepared to partner on development and procurement with AW taking on additional financial risk following the renegotiation of the Future Lynx contract in order to match the MoD’s funding profile without any substantial loss of operational capability.

6. Partnering and the ever closer and more open relationship that it brings, has the potential to enable industry and the MoD to get together and plan strategically in the interests of both parties. This would provide a more coherent longer-term level of predictability that enables the prime contractors to align and maintain the industrial health of their supply chain as well as the operational sovereignty of key future capability requirements as required by DIS. This is an important driver towards keeping costs down. In addition, the closer the intellectual relationship the greater the chances are of creating innovation and of sharing the risks with increased confidence by industry to make PV investments. However, the challenge for both sides is that while the UK approach to competition remains one of the most open in the industrialised nations, the relationship between competition and partnership requires further clarification and understanding if partnering is to move into its next, potentially even more productive, phase.

7. The important procurements relevant to the Helicopter Inquiry’s focus on Afghanistan and Iraq are concentrated mainly on maintaining and increasing battlefield helicopter lift; these include the recent Merlin Mk3A acquisition, Sea King performance enhancements and the potential life-extension of the Puma. The recent confirmation of the Future Lynx for the RN and the Army will also provide a multi-role light lift capability as well as reconnaissance and surface attack capabilities. An example of a successful helicopter capability upgrade is the integration of the Carson rotor-blades to the Sea King, which demonstrates how a partnering approach has resulted in a competitor’s blade being fitted to the aircraft to the mutual benefit of the Armed Forces and industry.

8. The Future Medium Helicopter programme will potentially play a dominant role in the competition for the scarce resources likely to be available for future procurements. This will inevitably require the MoD to prioritise its requirements and take risks against operational output as it is not clear that all the programmes are affordable within the current budgets. But it is also the responsibility of industry to play its part to ensure that the provision of essential helicopter capability is as affordable as possible. Industry would therefore welcome clarity on the relative priority and costs likely to be afforded to each programme to aid planning and risk related investment. In addition a stronger focus for a coherent tri-service helicopter strategy energised by a single senior point of contact within the UK MoD would also be welcomed.

The Support Structure Underpinning Helicopter Operations

9. The support structure underpinning helicopter operations is an area undergoing significant change. Prior to the introduction of the Integrated Operational Support (IOS) schemes the MoD was responsible for all elements of the aircraft’s support from the front line to depth maintenance facilities. This included the timely and accurate ordering of aircraft spares and support equipment. Industry provided 4th line support which centred upon technical product support and additional repair and overhaul capacity.

10. The concept of an IOS scheme is to transfer more responsibility and hence risk to industry, allowing the MoD to focus on the support to the aircraft on deployed operations and those preparing for deployment. Within an IOS scheme, MoD defines a flying hour requirement and fleet size, industry is then required to deliver the requisite number of aircraft to the MoD. This entails industry being wholly responsible for all support elements from determining the number of spares to buy and hold in stock right up to managing the depth maintenance facilities. Payment is also linked to the achievement of flying hours which ensures that industry are fully incentivised to improve any weaknesses in the aircraft or support structure.

11. Sea King Integrated Operational Support (SKIOS) was the first contract to be signed in 2005 for the support of 130 RN and RAF Sea King aircraft. The Integrated Merlin Operational Support (IMOS) contract, signed in 2007, provides long term, support that incentivises industry provide continually improving performance for all Merlin helicopters. Although still in its early phase, the IOS concept is successfully increasing aircraft availability to the MoD at reduced cost and AW are planning to further reduce the cost of ownership as a result of the incentives inherent within these contracts.

12. Established in March 2007 as an SPA initiative, the Joint Modifications Scheme (JMS) has corralled work on modifications and Urgent Operational Requirements (UOR) under one collaborative MoD and AW organisation. It has taken on 490 modifications since its launch, including 40 UORs, and is another positive example of how a MoD and industry partnership can cut out process and time and deliver an improved helicopter capability to the front-line.

13. AW continues to develop a range of training capabilities to meet the training requirements of all three services. In particular, Apache training delivered through Aviation Training International Ltd (ATIL a 50:50 JV with Boeing), is delivering real benefit to crews as they train for operations; pressure on front-line crews is also being relieved through the provision ATIL instructors to supplement Army Instructors on the
Apache conversion unit. Training of helicopter aircrew and maintainers remains an area where there are many opportunities for innovation, particularly to reduce the time spent by service pilots in training and to make savings through initiatives that reduce the overall MoD balance sheet.

2 April 2009

Memorandum from the Ministry of Defence

This memorandum provides evidence in the four areas sought by the House of Commons Defence Committee:

— Current and future size and structure of the helicopter fleet
— Current procurement and maintenance projects
— The support structure underpinning helicopter operations
— The role played by helicopters on operations

Given the classification of the information relating to the role played by helicopters on operations, this section is of necessity provided in strict confidence in a separate classified annex and should not be disclosed outside the Committee.

As with much of the MoD’s business, the world of helicopter capability is littered with acronyms and complex terms and so an annex of acronyms and a glossary of terms will be provided to accompany this memorandum.

SECTION 1: CURRENT AND FUTURE SIZE AND STRUCTURE OF THE HELICOPTER FLEET

1.1. Helicopters are operated by all three Armed Services in a variety of roles ranging from UK Search and Rescue to battlefield support in Afghanistan to global maritime patrol. Altogether, the MoD’s helicopter fleet consists of 586 aircraft, comprising eight models broken down into 19 marks (Mk).

1.2. As with all equipment capabilities, the Department plans its current and future helicopter force structures on the basis of an assessment of the capability required to undertake those military tasks and operational scenarios for which it is assessed helicopter capability will be required to achieve military success. Helicopters do not provide a singular capability and can be utilised in a wide range of roles. For that reason, the Department’s helicopter capability requirements are broken out into more detail. In some instances a particular helicopter platform may be able to support several different capability requirements.

In addition, the need to provide helicopter capability in both the maritime and battlefield environments has a bearing on the specific capabilities and performance characteristics that may be required of a platform to cope with the particular challenges of an environment. MoD’s helicopter capability requirements include:

(a) **Support Helicopters**—required in both maritime and battlefield environments, this capability relates to the movement of personnel and equipment. MoD’s Support Helicopter fleet is categorised according to the aircraft’s Maximum All Up Mass (MAUM)\(^6\) in either Light, Medium Lift or Heavy Lift classes. While there is no universal definition of the boundaries between these classes, the Department routinely defines the Medium class as being between about 7 tonnes and 16 tonnes MAUM.

(i) **Heavy Lift**—the only helicopter in the MoD’s inventory capable of providing this capability in either the battlefield or maritime domain is the Chinook

(ii) **Medium Lift**—In the maritime domain, this role can be performed by the Merlin Mk1 and the Sea King Mks 4 and 6. In the battlefield domain, this role is currently met by the Merlin Mk 3/3a, the Sea King Mk 4 and Puma

(iii) **Light**—In the maritime domain this role is currently performed by the Lynx Mks 3 and 8. In the battlefield domain it is performed by the Lynx Mks 7 and 9

(b) **Find and Attack**—required in both the maritime and battlefield domains, the Find function relates to the ability to locate enemy or friendly forces. In the battlefield domain it is most often referred to as armed reconnaissance, while in the maritime domain it is known as armed maritime patrol. The Attack function is also required in both domains and relates to the ability to then prosecute the target. Anti-Surface Warfare and Anti-Submarine Warfare both fall under the Find and Attack function. In the maritime domain, MoD’s Find and Attack helicopters are the Lynx Mks 3 and 8, the Merlin Mk 1 and the Sea King Mk 7, in the battlefield domain they are the Apache, the Gazelle and the Lynx Mks 7 and 9.

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\(^6\) The heaviest take off mass at which the aircraft has been shown to meet applicable airworthiness requirements.
1.3. Each of the Armed Services commands helicopter crews and airframes in order to fulfil the military tasks they are required to support. Command structures are covered in more detail in Section 4.

**ROYAL NAVY**

1.4. The Royal Navy requires helicopters that are able to operate in the maritime environment, requiring the airframes to be specifically built to cope with salt corrosion (sometimes referred to as being *marinised*) and to be able to embark for operations to provide ships and task forces with an organic capability (sometimes referred to as being *ship-optimised*). The Royal Navy’s primary requirement is for Find and Attack capability, although its helicopters also fulfil secondary roles providing support and Search and Rescue capabilities.

1.5. The principal role of the Lynx Mk 3 and 8 and the Merlin Mk 1 is maritime patrol, including Anti-Submarine and Anti-Surface Warfare. The Lynx Mk 3 and 8 are utilised primarily to conduct Anti-Surface Warfare although they can also be used for Anti-Submarine Warfare and Maritime Counter-Terrorism operations. The Merlin Mk 1 is the primary asset to conduct Anti-Submarine Warfare although it too can provide an Anti-Surface Warfare capability. It can also provide a Medium Lift capability and can fulfil a limited Search and Rescue function. In the North Arabian Gulf, the Merlin Mk 1 performs oil platform protection, while embarked (ship-borne) Merlin and Lynx are engaged in a range of counter-narcotics, counter-piracy and counter-terrorism operations in the Caribbean and Mediterranean and off the coast of both Iraq and the Horn of Africa. Alongside these Standing Overseas Commitments, Merlin and Lynx aircraft are carried by Royal Navy ships on deployment around the world. The Sea King Mk 7 Airborne Surveillance and Control helicopter can also be carried aboard Royal Navy ships and is used to provide early detection and prosecution of enemy aircraft. It also provides over the horizon targeting for surface launched weapon systems against other surface targets and to provide airspace control. In the near-term, however, the Department is considering deploying this sophisticated surveillance capability to Afghanistan.

1.6. Royal Navy helicopters also operate in support of the Royal Marine Commandos. The Commando Helicopter Force consists of the Sea King Mk 4 and Mk 6c Medium Lift helicopters and the Lynx Mk 7 Light Helicopter, which is an Army asset operated by both the Army Air Corps (AAC) and the Commando Helicopter Force. While capable of operating in purely land-based roles, the Sea King Mk 4 has traditionally provided a littoral manoeuvre (ship-to-shore transport) capability and Lynx Mk 7 has provided force protection and reconnaissance, both in support of 3 Commando Brigade. The Sea King Mk 4 is now deployed in Afghanistan on an enduring basis and its roles include troop transportation, while the Commando Helicopter Force’s Lynx Mk 7 has been providing a multi-role battlefield Light Helicopter in turn with AAC-operated Lynx. The Sea King Mk 6c is a modified aircraft providing temporary training support to the Commando Helicopter Force. They will be retired from service next year.

1.7. For Search and Rescue the Royal Navy utilises the Sea King Mk 5.

**ARMY**

1.8. The Army’s helicopter capability is provided by the AAC and takes the form of battlefield helicopters.

1.9. The AAC’s helicopter capabilities are concentrated on delivering the Find and Attack functions, although they also provide limited troop transportation and command support roles. The Lynx Mk 7 and 9 are Light Helicopters which perform several battlefield roles on operations in Iraq and Afghanistan including reconnaissance, direction and control of fires, limited troop transportation and command support. Lynx can also provide Manned Airborne Surveillance which augments other Intelligence Surveillance Targeting and Reconnaissance (ISTAR) platforms such as Unmanned Aerial Vehicles (UAVs) as part of the integrated ISTAR matrix.

1.10. The AAC operates the Apache Attack Helicopter which has taken over the primary helicopter attack role from Lynx. Equipped with Hellfire missiles, CVR7 rockets and a 30mm cannon, it also has sophisticated surveillance and reconnaissance capabilities. It has provided crucial support to ground forces in Afghanistan since 2006.

1.11. The Gazelle Light Helicopter continues to be operated by the AAC in certain specialist capabilities. It can be considered a battlefield helicopter, however, it lacks Defensive Aids Suites and is no longer deployed on overseas operations. The vast majority have been withdrawn from service but a limited number of Gazelles continue to fulfil an operational role in the UK and also support to training in Canada.

1.12. The Army also operates commercially owned helicopters which provide support to training in Belize and Brunei. These are not considered to be within the scope of this memorandum.
ROYAL AIR FORCE

1.13. The RAF provides battlefield helicopter and Search and Rescue capabilities.

1.14. The RAF’s battlefield helicopter capability is focused on the provision of Medium and Heavy Lift. The Puma and the Merlin Mk 3/3a helicopters provide Medium Lift capability while the Chinook Mk 2/2a provides Heavy Lift support. The Merlin Mk 3 and the Puma are currently providing support to operations in Iraq. The Merlin Mk 3 will redeploy to Afghanistan as soon as practicable following the completion of its mission in Iraq; the Puma will remain in Iraq principally to provide a transport role for the Foreign & Commonwealth Office in the Baghdad area, but it is likely to be deployed to Afghanistan to replace the Royal Navy Sea King Mk 4 in the medium-term. The Chinook Mk 2/2a is committed to essential Heavy Lift support to operations in Afghanistan and Very High Readiness contingency operations in the UK. Routinely, RAF Chinook helicopters also embark to meet Heavy Lift requirements for littoral manoeuvre operations. The RAF will also begin to receive the first of eight reverted Chinook Mk 3 helicopters at the end of this year.

1.15. The RAF’s Search and Rescue Helicopters are the Sea King Mk 3 and Mk 3a. Their primary function is provision of Search and Rescue capability in the UK and the Falkland Islands.

1.16. The RAF operates other helicopters including those of 32 Squadron, in a communications role, and Search and Rescue helicopters assigned to the Joint Operating Base on Cyprus. These aircraft are not owned by the MoD and are not considered within the scope of this memorandum.

CURRENT AND FUTURE SIZE OF THE HELICOPTER FLEET

1.17. The MoD provided a detailed table in its memorandum to the Committee for the Defence Equipment Enquiry in late 2008 which set out which helicopters fleets the Department operates, the numbers and the planned out of service dates (OSDs). This table has been updated and reproduced at the end of this section as Table 1 to provide a full and comprehensive summary of MoD’s current helicopter capabilities. It provides a breakdown of the 586 aircraft currently in the military helicopter fleet, excluding helicopters that the Department operates but does not own, and sets out the respective OSDs. The table excludes leased helicopters and the eight Chinook Mk 3 helicopters undergoing reversion.

1.18. Helicopter numbers are set out in three columns: the MoD’s Departmental Fleet, the Effective Fleet and the Non-Effective fleet. These terms are defined as:

(a) **MoD Departmental Fleet**—all MoD owned aircraft currently on the Military Register. This includes all “effective” and “non-effective” aircraft.

(b) **Effective Fleet**—those aircraft expected to be flown by the Armed Services. This includes all aircraft in Forward and Depth. Depth includes Depth maintenance and repair, those undergoing modification, trials aircraft (other than manufacturers’), storage (including attrition/reserves) and surplus aircraft awaiting classification as “non-effective”.

(c) **Non-effective Fleet**—Aircraft no longer expected to be flown by the Armed Services. Aircraft still on the Military Register that have been declared surplus and are awaiting disposal, plus Ground Instructional Aircraft. 62 of the 586 helicopters are categorised as non-effective.
1.19. The Department plans to carry out Life Extension Programmes (LEPs) to extend the OSDs of several of its helicopters. Where an LEP is planned, the resulting extended OSD is set out in brackets in the Current Planned OSD column of Table 1. It is important to note though that these are planning assumptions which remain subject to approval from the Department’s Investment Approvals Board.

1.20. MoD also expects to complete a number of helicopter procurement programmes in the next decade. The capabilities currently provided by the Lynx and Gazelle fleet will be provided by Future Lynx\(^7\) from the middle of the next decade, the Sea King Mk 3/3A and 5 will be replaced under a Private Finance Initiative (PFI) for Search and Rescue and the first tranche of the Future Medium Helicopter capability should also be introduced in this timescale. In addition the eight Chinook helicopters reverted from Mk 3 standard to the Mk 2/2A standard are also not included in the table but will have been introduced into service.

1.21. As with all Defence programmes, it is not until Main Gate approval has been obtained that decisions such as the final aircraft numbers, the timescales for the upgrades and the revised OSDs are confirmed. As such, the information provided in Table 1 is susceptible to change and the Department cannot be precise about the number and type of helicopters that will be in service in the medium-term. It is also important to recognise that MoD’s delivery of capability (which may include Contracting for Availability—see Section 2) is the primary measure of success and so a focus on overall numbers alone can be misleading.

REDUCTION IN THE SIZE OF THE HELICOPTER FLEET

1.22. Over the next ten years, the overall size of the helicopter fleet will reduce. This is principally due to: changes in the way the Department delivers battlefield capabilities, which are leading to a restructuring of the Light Helicopter component; the intention to replace the Sea King Search and Rescue capability with a joint PFI in partnership with the Maritime and Coastguard Agency; and to improvements and changes in technology and support solutions (see Section 2) which allow us to provide greater capability with fewer helicopters or through the use of other assets such as UAVs. The configuration of the Department’s future helicopter fleet is driven by an assessment of the optimum mix of platforms (both helicopters and other non-rotary platforms) to meet capability requirements.

\(^7\) Future Lynx will be known formally as AW159 Lynx Wildcat; the manufacturer AgustaWestland is hosting a naming event on 24 April.
REDUCTION IN LIGHT HELICOPTERS

1.23. MoD currently owns 91 Gazelle Light Helicopters with an OSD of 2012. As has already been explained, the Gazelle is an older aircraft with limited capability and, whilst it was originally operated as a battlefield helicopter, it is no longer deployed on operations overseas and its former communications and ISTAR role is being performed on operations by other helicopter and non-rotary wing assets. There is therefore no overarching requirement to replace the Gazelle fleet as a whole with another rotary wing fleet. Where there is a residual requirement to do so, the Department is assessing the best way to continue to deliver capabilities currently provided by Gazelle aircraft in the UK.

1.24. MoD also currently operates 176 Lynx Light Helicopters, 108 in the battlefield role and 68 in the maritime role. The Department is replacing these aircraft with 62 Future Lynx, 34 in the battlefield role in 2014 and 28 in the maritime role in 2015. This reduction is partly a result of the considerable increase in capability which Future Lynx will provide over current Lynx in terms of its projected availability rates, its performance in hot and high conditions and its sensor fit. In addition the development of a common aircraft build standard and training and support arrangements for both Royal Navy and Army variants will give the Future Lynx fleet greater versatility and flexibility including an ability to move aircraft, by changing role equipment, between the two roles. Importantly, there has also been a change to the capability requirement. Ten years ago, Army Lynx provided ground attack as well as surveillance and reconnaissance. Now ground attack is principally conducted by the Apache Attack Helicopter and the Armed Forces have benefited from a huge growth in the availability of UAVs which have reduced the requirement for helicopter-borne surveillance and reconnaissance. While in the maritime domain, helicopter numbers are in part a reflection of the ships they are required to support.

FUTURE OF SEARCH AND RESCUE HELICOPTERS

1.25. Under current plans the Department expects to replace the Search and Rescue capability provided by its 40 Sea King Mks 3/3a and Mk 5 helicopters with a joint PFI service with the Maritime and Coastguard Agency. Whilst the helicopters provided by this service will be manned partly by military aircrew, the platforms themselves will not be owned by the MoD.
<table>
<thead>
<tr>
<th>Aircraft type/Mark</th>
<th>MoD Dept Fleet</th>
<th>Effective Fleet</th>
<th>Non-Effective Fleet</th>
<th>Current Planned OSDs</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>Agusta 109</td>
<td>4</td>
<td>4</td>
<td>NIL</td>
<td>2009</td>
<td>It is expected these aircraft will be replaced during 2009.</td>
</tr>
<tr>
<td>Apache</td>
<td>67</td>
<td>67</td>
<td>NIL</td>
<td>2030</td>
<td>MoD expects to have to invest further in this aircraft (eg to address obsolescence and meet emerging requirements) during the next decade, in order to sustain its service life up to 2030.</td>
</tr>
<tr>
<td>Chinook Mk 2</td>
<td>34</td>
<td>34</td>
<td>NIL</td>
<td>2015 (2040)</td>
<td>MoD expects to have to invest further in these aircraft (eg to address obsolescence, to meet emerging requirements and to extend the date of their retirement to 2040) during the next decade, although no investment decisions have yet been made.</td>
</tr>
<tr>
<td>Chinook Mk 2a</td>
<td>6</td>
<td>6</td>
<td>NIL</td>
<td>2025 (2040)</td>
<td>Where there is an enduring requirement for the capability currently provided by Gazelle, MoD is exploring arrangements based on leased aircraft.</td>
</tr>
<tr>
<td>Gazelle</td>
<td>91</td>
<td>56</td>
<td>35</td>
<td>2012</td>
<td>It is expected that these aircraft will be replaced by the maritime variant of Future Lynx from 2015.</td>
</tr>
<tr>
<td>Lynx Mk 3</td>
<td>34</td>
<td>29</td>
<td>(see note 1) 5</td>
<td>2013</td>
<td>It is expected that these aircraft will be replaced by the battlefield variant of Future Lynx from 2014.</td>
</tr>
<tr>
<td>Lynx Mk 8</td>
<td>34</td>
<td>33</td>
<td>1</td>
<td>2015</td>
<td>MoD is currently preparing to upgrade 30 (see note 4) of these aircraft through the Merlin Mk1 Capability Sustainment Programme.</td>
</tr>
<tr>
<td>Lynx Mk 7</td>
<td>84</td>
<td>74</td>
<td>10</td>
<td>2013</td>
<td>MoD expects to have to invest further in this aircraft (eg to address obsolescence and meet emerging requirements) during the next decade, in order to sustain its service life up to 2030.</td>
</tr>
<tr>
<td>Merlin Mk 9</td>
<td>24</td>
<td>22</td>
<td>2</td>
<td>2013</td>
<td>MoD expects to have to invest further in this aircraft to extend its out of service date. The Department anticipates that the planned upgrade will extend the service life of Puma to 2022 or beyond. The capability provided by these aircraft will be replaced by the Future Medium Helicopter Programme.</td>
</tr>
<tr>
<td>Merlin Mk 3a</td>
<td>6</td>
<td>6</td>
<td>NIL</td>
<td>2030</td>
<td>It is expected that the capability provided by this aircraft will be replaced by a joint PFI service with the Maritime and Coastguard Agency.</td>
</tr>
<tr>
<td>Puma</td>
<td>43</td>
<td>34</td>
<td>9</td>
<td>2012 (2022 +)</td>
<td>MoD expects to have to invest further in this aircraft to extend its out of service date of their retirement to 2018, whereupon it is expected that the capability provided by these aircraft will be replaced by the Future Medium Helicopter Programme.</td>
</tr>
<tr>
<td>Sea King Mk 3/3a</td>
<td>25</td>
<td>25</td>
<td>NIL</td>
<td>2017</td>
<td>It is expected that the capability provided by this aircraft will be replaced by a joint PFI service with the Maritime and Coastguard Agency.</td>
</tr>
<tr>
<td>Sea King Mk 4</td>
<td>37</td>
<td>37</td>
<td>NIL</td>
<td>2012 (2018)</td>
<td>MoD expects to have to invest further in this aircraft to extend the planned date of their retirement to 2018, whereupon it is expected that the capability provided by these aircraft will be replaced by the Future Medium Helicopter Programme.</td>
</tr>
<tr>
<td>Aircraft type/mark</td>
<td>MoD Departmental Fleet</td>
<td>Effective Fleet</td>
<td>Non-Effective Fleet</td>
<td>Current Planned OSDs</td>
<td>Comments</td>
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<td>----------</td>
</tr>
<tr>
<td>Sea King Mk 6c</td>
<td>5</td>
<td>5</td>
<td>NIL</td>
<td>2010</td>
<td>It is expected that the capability provided by these aircraft will be replaced by a joint PFI service with the Maritime and Coastguard Agency.</td>
</tr>
<tr>
<td>Sea King Mk 5</td>
<td>15</td>
<td>15</td>
<td>NIL</td>
<td>2017</td>
<td>MoD expects to have to invest further in this aircraft to extend the planned date of their retirement to 2022.</td>
</tr>
<tr>
<td>Sea King Mk 7</td>
<td>13</td>
<td>13</td>
<td>NIL</td>
<td>2018 (2022)</td>
<td></td>
</tr>
</tbody>
</table>

**Notes:**

Note 1: The Non-effective fleet currently includes 30 aircraft for disposal and five ground training aircraft.

Note 2: Since the last report one Lynx Mk 3 has moved from Effective to Non-effective.

Note 3: Four of these aircraft are in storage and have been cannibalised heavily; one has been extensively modified as part of a joint MoD/Industry technology demonstrator programme. Recovery to a fully serviceable condition would take significant time and investment. These aircraft are, under today’s definitions, classified as effective until such time that a decision is taken to dispose of them.

Note 4: The Department reviewed its investment plans across a number of capability areas during 2008; this review was known as The Equipment Examination. As a result, the Department has determined that, given current defence priorities, it would not take up an option to modify an additional eight Merlin Mk1 aircraft and that its contractual commitment would remain at 30 aircraft. The Department is currently exploring whether the Department has further use for those aircraft not being modified under the Merlin Capability Sustainment Programme, they will otherwise be disposed of in the most cost effective way (including consideration of sales opportunities.)

Note 5: The Non-effective fleet include five “Category 5” plus four “Category 4” damaged helicopters not expected to fly again as Puma Mk 1 aircraft.
ENCLOSURE 1 TO SECTION 1: PRINCIPAL OPERATIONAL HELICOPTERS OF THE DEPARTMENTAL FLEET
(weapons fit, crew numbers and performance may vary dependent on role and operating environment)

**LYNX Mk 3 & Mk8**

- **Roles**: ASW, ASuW,
- **Weapons**: 1 * 0.5 Inch cabin or pod mounted gun, Sting Ray Torpedo, Depth Charge, Sea Skua
- **Crew**: 1 Pilot 1 Observer
- **Max Speed**: 160 kts
- **Max Passengers**: 7
- **Lifting Capacity**: 1 tonnes
- **Number in Dept Fleet**: 34/34
- **FRONT LINE COMMAND**: Navy Command

**MERLIN Mk 1**

- **Roles**: ASW, ASuW, Limited SAR, CASEVAC
- **Weapons**: Sting Ray Torpedo, Depth Charge, 1 * cabin mounted GPMG.
- **Crew**: Max 2 Pilots 2 Crew
- **Max Speed**: 167 kts
- **Max Passengers**: 16
- **Lifting Capacity**: 3.5 Tonnes
- **Number in Dept Fleet**: 42
- **FRONT LINE COMMAND**: Navy Command

**SEA KING Mk 7**

- **Roles**: Airborne Surveillance and Control.
- **Weapons**: None
- **Crew**: 2 Pilots 2 Crew
- **Max Speed**: 125 kts
- **Max Passengers**: 5
- **Lifting Capacity**: N/A
- **Number in Dept Fleet**: 13
- **FRONT LINE COMMAND**: Navy Command
**Roles**
Medium Lift Battlefield and Embarked Littoral Support

**Weapons**
1 * Cabin Mounted GPMG or M3M Mini-Gun

**Crew** 2 Pilots 1 Crew

**Max Speed** 125 kts

**Max Passengers** 17

**Lifting Capacity** 2.5 Tonnes

**Number in Dept Fleet** 37

**FRONT LINE COMMAND** Joint Helicopter Command (RN)

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**SE A K I N G Mk 4**

**Roles**
SAR

**Weapons**
None

**Crew** 2 Pilots 2 Crew

**Max Speed** 125 kts

**Max Passengers** 17

**Lifting Capacity** 2.5 Tonnes

**Number in Dept Fleet** 15

**FRONT LINE COMMAND** Navy Command

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**SE A K I N G Mk 5**

**Roles**
Troop Transport, Reconnaissance

**Weapons**
1 * Cabin Mounted GPMG or 0.5’ Machine Gun.

**Crew** 2 Pilots

**Max Speed** 160 kts

**Max Passengers** 7

**Lifting Capacity** 1 Tonne

**Number in Dept Fleet** 84/24

**FRONT LINE COMMAND** Joint Helicopter Command (Army & RN)

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**LYNX Mk 7 & Mk 9**
### APACHE

**Roles**  
Attack, Armed Reconnaissance.

**Weapons**  
30 mm Cannon, Wing Mounted 17 mm Rocket, Hellfire Missile Systems

**Crew** 2

**Max Speed** 140 kts  
**Max Passengers** N/A  
**Lifting Capacity** N/A

**Number in Dept Fleet** 67

**FRONT LINE COMMAND**  Joint  
Helicopter Command (Army)

### GAZELLE

**Roles**  
Reconnaissance, CASEVAC, Light Utility, Airborne Command.

**Weapons**  
None

**Crew** 1 Pilot

**Max Speed** 140 kts  
**Max Passengers** 4

**Lifting Capacity** N/A

**Number in Dept Fleet** 91

**FRONT LINE COMMAND**  Joint  
Helicopter Command (Army)

### CHINOOK Mk 2/2a

**Roles**  
Heavy Lift Battlefield Support, CASEVAC, Embarked Littoral Support

**Weapons**  
2 * M134 Mini-Gun + 1 * Ramp Mounted M60

**Crew** 2 Pilots 2 Crew

**Max Speed** 160 kts  
**Max Passengers** 55

**Lifting Capacity** 10 Tonnes

**Number in Dept Fleet** 40 (34 Mk2/6 Mk2a) (excludes 8 Mk3)

**FRONT LINE COMMAND**  Joint  
Helicopter Command (RAF)
<table>
<thead>
<tr>
<th>Helicopter</th>
<th>Roles</th>
<th>Weapons</th>
<th>Crew</th>
<th>Max Speed</th>
<th>Max Passengers</th>
<th>Lifting Capacity</th>
<th>Number in Dept Fleet</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>MERLIN Mk 3/3a</strong></td>
<td>Battlefield Support, Combat SAR, CASEVAC</td>
<td>2 * Cabin Mounted GPMG, 1 * Ramp Mounted GPMG</td>
<td>2 Pilots 2 Crew</td>
<td>167 kts</td>
<td>24</td>
<td>4.1 Tonnes</td>
<td>28 (22 Mk3/6 Mk3A)</td>
<td>FRONT LINE COMMAND Joint Helicopter Command (RAF)</td>
</tr>
<tr>
<td><strong>PUMA</strong></td>
<td>Medium Lift Battlefield Support, CASEVAC</td>
<td>1 * Cabin Mounted GPMG</td>
<td>2 Pilots 1 Crew</td>
<td>147 kts</td>
<td>16</td>
<td>2 Tonnes</td>
<td>43</td>
<td>FRONT LINE COMMAND Joint Helicopter Command (RAF)</td>
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<tr>
<td><strong>SEA KING Mk 3/3a</strong></td>
<td>SAR.</td>
<td>None</td>
<td>2 Pilots 2 Crew</td>
<td>125 kts</td>
<td>17</td>
<td>2.5 Tonnes</td>
<td>25 (19 Mk3/6 Mk3A)</td>
<td>FRONT LINE COMMAND Air Command</td>
</tr>
</tbody>
</table>
SECTION 2: CURRENT PROCUREMENT AND MAINTENANCE PROJECTS

2.1. To deliver the helicopter capabilities which the Armed Services will require, MoD intends to carry out a mix of Life Extension and Sustainment programmes on a number of its current fleets as well as procurement projects to deliver new capabilities. The Department is planning to invest around £6 billion in helicopters over the next 10 years, comprising approximately £2.5 billion in enhancements to the current helicopter fleet (both to improve their capability and to sustain their in-service lives) and approximately £3.5 billion in procuring new capabilities.

HELICOPTER LIFE EXTENSION AND SUSTAINMENT PROGRAMMES

2.2. Table 1 in Section 1 highlights the Department’s intention to invest in work on several of its current fleets either to extend the service life or to ensure that the platform can meet its expected service life.

2.3. In some instances the work MoD is required to carry out is to sustain the platform to its expected OSD by addressing obsolescence caused by advances in technology and ensuring the continued safety and airworthiness of the aircraft. For instance, the Department might need to replace electronic components that are no longer supportable given the rate of technological advance in this area and might take advantage of improvements in areas such as Defensive Aids Suites. The Department is currently carrying out a Sustainment Programme for the Merlin Mk 1 aircraft which is due to go out of service in 2029. MoD also intends to carry out sustainment programmes for the Apache, the Sea King Mk 7 and the Merlin Mk 3.

2.4. In other instances the Department plans to carry out LEPs where it assesses there is scope on money grounds to extend the expected OSD of a platform type. These programmes often amount to a significant upgrade of a platform type, for which a significant engineering overhaul of the platform is required. The Department is planning to undertake a number of LEPs, including on Chinook where it is assessing the best way to ensure that the military Heavy Lift capability is retained through to 2040. It should be noted that these programmes have not yet been approved under the Department’s investment approvals process. The programmes closest to their main investment decision point are:

(a) Puma LEP—This programme will upgrade several elements of the Puma Mk 1 aircraft, including the engines and avionics. The resulting Puma Mk 2 aircraft will be a significantly more capable aircraft which it is assessed will remain in service into the early 2020s at which point it is expected to be replaced under the Future Medium Helicopter (battlefield lift) Programme.

(b) Sea King Mk 4 LEP—This is a limited programme to extend the life of the Royal Navy Sea King Mk 4 which will address obsolescence, safety and legislative requirements. It will also incorporate modifications to improve performance in the environmental conditions and altitudes experienced in Afghanistan through the addition of Carson main rotor blades and a five-blade tail rotor, and the provision of a Bowman communications capability. It is anticipated that these measures will enable MoD to extend the OSD of Sea King Mk 4 to 2018 at which point it will, under current plans, be replaced by the Future Medium Helicopter (littoral manoeuvre).

2.5. The “Medium-Term Helicopter Capability” diagram provided at Enclosure 1 to this section provides an indicative timeframe for Life Extension and Sustainment Programmes.

2.6. Beyond formal Life Extension and Sustainment Programmes, MoD routinely carries out minor modifications to its platforms to deliver capability enhancements. These might, for instance, include new safety measures.

HELICOPTER PROCUREMENT PROGRAMMES

2.7. Over the next decade the Department intends to carry out two significant procurement programmes: Future Lynx and the Future Medium Helicopter.

FUTURE LYNX (AW159 LYNX WILDCAT)

2.8. The Future Lynx Programme is on contract and will deliver a new Light Helicopter for the Royal Navy and the Army mid-next decade to replace current Lynx helicopters. The Royal Navy variant of Future Lynx will provide an agile maritime capability providing Anti-Surface Warfare capability and force protection and will operate in support of littoral manoeuvre. They will be an important element of ship defence against surface threats and can carry out an Anti-Submarine role, as well as acting as a light utility helicopter. The Army variant of Future Lynx will perform a range of tasks on the battlefield including reconnaissance, command and control, the transportation of troops and materiel, and the provision of force protection. MoD is procuring 62 Future Lynx, 34 in the battlefield role entering service in 2014 and 28 in the maritime role entering service in 2015.
**Future Medium Helicopter**

2.9. The Future Medium Helicopter Programme is expected to meet two requirements, a Medium Lift helicopter to support littoral manoeuvre, replacing the capability currently provided by the Royal Navy Sea King Mk 4 operated by the Commando Helicopter Force, and a Medium Lift helicopter to replace the capability currently provided by the RAF Puma battlefield helicopter. MoD’s planning assumptions are that entry into service of the Future Medium Helicopter (littoral) will be timed to be coherent with the retirement of Sea King Mk 4, with Future Medium Helicopter (battlefield) entering service in the early 2020s.

**UK Peace Time Search and Rescue**

2.10. The Search and Rescue Helicopter PFI strategy was announced as a joint project by the MoD and Department for Transport in May 2006. A “competitive dialogue” is being used to progressively refine the Search and Rescue helicopter requirement, develop bidders’ solutions and will culminate in the selection of a preferred bidder. The contract will replace the current UK Search and Rescue helicopter capability, which is provided today by Royal Navy and RAF Sea King helicopters and a civilian helicopter service contracted by the Maritime and Coastguard Agency, with a joint service that is no less effective than the current one. Two consortia are engaged in the competition, and are expected to deliver the new service over the coming decade.

**Helicopter Support**

2.11. Beyond seeking to ensure that it has the necessary helicopter numbers to deliver the capabilities the Armed Services require, the other key equipment concern is to ensure that MoD is able to support its aircraft and provide the necessary levels of serviceability to the front line.

2.12. The Department is in the process of transforming the way it delivers equipment support, including for helicopters, under a process known as the transformation staircase (see Figure 2 below). Historically, under traditional support arrangements, when equipment broke the Department had to pay to repair it and there was little incentive on the supplier to improve the reliability and maintainability of the product. The Department then moved onto arrangements that helped incentivise reliability by replacing some broken parts with spares provided within the contract price, which is known as spares inclusive arrangements. MoD is now increasingly moving towards arrangements for all of its helicopters that see payments made only when the equipment is serviceable, hence providing an even stronger incentive to provide equipment that can be made available for use the maximum amount of time. This is known as Contracting for Availability but in the field of helicopters is often referred to as Integrated Operational Support (IOS). The MoD already has a number of such contracts in place, with both AgustaWestland for Sea King and Merlin and with Boeing for Chinook, with similar arrangements planned for other aircraft. The recent Gnome Engine availability contract for the Sea Kings signed in December 2008 is also an example of incentivising equipment availability.

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**Figure 2**

THE TRANSFORMATION STAIRCASE

- **Contracting for Availability**: Supplier responsible for delivering platforms and equipment to an agreed performance and outputs standard.
- **Contracting for Capability**: Supplier responsible for providing a capability (e.g. Air to Air Refuelling) and outputs to agreed performance standards.
2.13. The principle benefit of Contracting for Availability or IOS arrangements is that the Department is able to focus on deciding the level of support that is required (the output) and looking to Industry to manage the delivery of the required output. This leaves industry to bring its full potential and expertise to bear to provide an enhanced support service at the minimum cost. The Department’s aim is to deliver better value for money through an optimised supply chain and more efficient asset management to maximise the level of output that can be provided to the front line. The payment mechanism is based on flying hours—the Users’ principle unit of output. Both MoD and Industry agree that the quality and responsiveness of support services now delivered under IOS are significantly improved in comparison to traditional support arrangements. By working together to improve every aspect of their business relationship, with further incentives under gain-share, IOS contracts are focusing on continuous improvement opportunities in both processes and products, delivering reliability improvements that drive up availability and bear down on whole-life cost, while maintaining safe and available aircraft.

2.14. In terms of benefits, Sea King Integrated Operational Support (SKIOS) is expected to provide a 20% through-life cost reduction, with the Integrated Merlin Operational Support (IMOS) expected to deliver about the same through-life cost reduction. AgustaWestland IOS arrangements are anticipated to save some £250 million over the next 10 years. For Chinook, the Boeing equivalent of IOS has not only generated significant savings but has been instrumental in significantly driving up platform utilisation to support operations on Op HERRICK. Activity levels are now 25% higher than ever previously achieved on the UK Chinook fleet. Moreover, depth maintenance Turn-Round Times have been reduced by over 40% and the recovery of damaged aircraft has been significantly accelerated, thereby increasing aircraft availability to the Front Line.

2.15. In some instances, the Department is examining the scope to move to contracting for capability or service provision whereby the Supplier is responsible for providing a capability and outputs to an agreed performance standard. The proposed PFI contract for Search and Rescue capability is an example of this.

MEASURING PERFORMANCE

2.16. The primary means of assessing whether the Department is delivering the required helicopter output is through measuring the level of flying hours that a particular fleet is able to generate, rather than the number of airframes available. Priority is given to meeting operational tasking requirements and ensuring that operational Commanders continue to have sufficient assets to undertake key tasks. The Department recognises that they could always do with more and continue to strive to increase the aircraft levels available to them.

ORGANISATIONAL STRUCTURE UNDERPINNING PROCUREMENT AND SUPPORT

2.17. The responsibility for determining military helicopter requirements lies with the Head of Capability for Air and Littoral Manoeuvre (HoC(ALM)). Under Through Life Capability Management processes, HoC(ALM) works with the front line commands, Defence Equipment and Support (DE&S), the scientific community, and MoD Centre to determine helicopter requirements; collectively these organisations are known as the MoD Unified Customer. These organisations work together on Capability Management Groups and Capability Planning Groups to determine capability requirements. HoC(ALM) is provided with a budget to meet these requirements.

2.18. The effective delivery of these capability requirements is dependent on timely and coherent management of the Defence Lines of Development (DLODs): Training, Equipment, Personnel, Infrastructure, Doctrine, Organisation, Information, and Logistics. This process is managed by the two helicopter Programme Boards (Heavy Lift and Find/Attack), chaired by HoC(ALM), attended by owners of each of the DLODs, and supported by a Programme Support Function. This approach recognises that the delivery of effective equipment offers nothing if it is not coherent with the delivery of the other DLODs. DE&S plays a key role in the delivery of the Equipment and Logistics DLOD (through its 10 helicopter Project Teams) and in supporting the effective coordination of all DLODs through the provision of the Programme Support Function.

2.19. While the above approach is relatively new within the Department, such a programme management approach has been adopted for most of the helicopter capability since the advent of the Future Rotorcraft Capability Programme in 2004. This holistic consideration of helicopter capability has supported trade-offs between difference capability areas (from both a finance and manpower perspective), better sequencing of investment opportunities and has allowed capability gaps to be better articulated.

INDUSTRIAL SUPPORT

2.20. Industry plays a vital role in the effective delivery of military capability and its support, and MoD continues, in general, to be pleased with the aerospace industry’s support to operations (to modify existing aircraft, buy new, and improve equipment support) over recent years. The demand that MoD is placing on Industry to support current operations is very high and the Department maintains a regular dialogue with key Suppliers to ensure priority demands are met.
2.21. Many of MoD’s current demands on Industry require the skills which the Department highlighted in the Defence Industrial Strategy as being essential to retain onshore, ie those critical to the through-life support of the current aircraft fleet (including technology insertion) and the verification of continued airworthiness of military helicopters. These skills are largely resident onshore at AgustaWestland, Yeovil. The demands of current operations, coupled with export business, and ongoing procurement and modification projects mean that those critical skills are safeguarded in the medium-term. However, beyond this the volume of new helicopters required by the MoD dictates that Industry will need to continue to transform its business models to focus more on new export orders and on the through-life support to the current fleet.
3.1. In delivering the flying hours necessary to meet operational requirements, the Department must provide the required number of appropriately trained air and ground crew and maintainers and the required number of airframes.

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**Medium-Term Helicopter Capability**

The diagram shows the scheduled programme for the Medium-Term Sustainment. Please note that until Main-Phase approval, precise dates for new capabilities cannot be provided.
organisation structure

3.2. The three Armed Services maintain Full Command of the recruitment and training of their helicopter personnel. However, Operational Command (that is their provision to operational commanders) of helicopter assets is divided between Navy Command, Air Command and the Joint Helicopter Command:

(a) **Navy Command**—maintains Operational Command of its maritime helicopter fleet of Anti-Surface and Anti-Submarine (Lynx Mks 3 and 8 and Merlin Mk 1), Airborne Surveillance (Sea King Mk 7) and Search and Rescue (Sea King Mk 5) helicopters. This fleet contributes to current operations, Standing Overseas Commitment and contingent operations both globally and in the UK.

(b) **Joint Helicopter Command**—maintains Operational Command of the Commando Helicopter Force (Lynx Mk 7 and Sea King Mk 4), the AAC helicopters (Apache, Gazelle and Lynx Mks 7 and 9) and the RAF Medium and Heavy Lift helicopter fleet (Merlin Mk 3, Puma and Chinook).

(c) **Air Command**—Operational Command of its Search and Rescue helicopters (Sea King Mk 3 and 3a).

provision of personnel

aircrew training

3.3. Candidates applying for a career as aircrew in the Royal Navy, Army and RAF must pass through a selection process involving medical screening, Aircrew Aptitude testing and Flying Grading before attending a Selection Board. Successful candidates then begin their aircrew training.

Elementary Flight Training

3.4. The first phase in the training of Armed Forces pilots is Elementary Flying Training (EFT) on light fixed wing aircraft. The EFT provides a profile of pilot competences which determines whether the pilot enters the Fast-Jet, Multi-Engine (fixed wing non-jet) or Rotary-Wing training stream.
ROTARY WING AIRCREW TRAINING SYSTEM

3.5. The aircrew of all three of the Armed Services\(^8\) begin their helicopter-specific training at the tri-service Defence Helicopter Flying School (DHFS) at RAF Shawbury, which comprises a Headquarters and five training squadrons. DHFS is a contracted service which is due to end in 2012. The Department is currently carrying out work to assess how best to take forward coherent helicopter training for the three Armed Services from that point.

3.6. **Ground School** is the first stage of training at RAF Shawbury. At the Ground School students learn the principles of flight, air operations and Crew Resource Management, the latter being focused on operational rather than aircraft-specific competences. Ground School also provides a technical introduction to the Squirrel helicopters which students will be flying during their Single Engine Basic Rotary Wing (SEBRW) Training.

3.7. **SEBRW Training** provided by 660 Squadron at Shawbury is the next phase of training and constitutes students’ first formal flying instruction. During 11 weeks of SEBRW training, students learn basic and advanced flying techniques, on successful completion of a Basic Handling Check they then progress to Single Engine Advanced Rotary Wing (SEARW) Training.

3.8. **SEARW Training** is carried out at Shawbury by 705 Squadron and is the point at which helicopter training for the three Armed Services begins to diverge. Army and RAF students undertake 35 hours with the SEARW Training with 705 Squadron, whilst Royal Navy students undertake 47 hours, with the extra 12 hours largely devoted to winch training and mountain flying (skills particularly necessary for those who will go on to become Royal Navy Search and Rescue aircrew or serve with the Commando Helicopter Force). Whilst Royal Navy students continue this more specialised training at Shawbury, Army students move to their Operation Training Phase (OTP) at the School of Army Aviation (SAAvn) at Middle Wallop to learn specialised skills including low-level tactical flying, the use of night vision goggles and the direction of artillery fire.

3.9. **MEARW Training** RAF students go to 60(R) Squadron at Shawbury to undertake Multi-Engine Advanced Rotary Wing (MEARW) Training before undertaking introductory Search and Rescue training at RAF Valley.

3.10. Students in all three services are assessed throughout their SEARW and MEARW Training and must successfully complete Final Handling Tests at the end of each phase of training before they can progress. In general, those unable to maintain progress are given a small number of additional flying sorties and if the required standard is not met, they are removed from the course.

3.11. **Operational Conversion Units (OCU)** This training is the final phase of the aircrew training system. It is undertaken on the helicopter that crews will be operating on when they join their frontline units. It provides them with specialised training in both the operation of the aircraft type and the way they might be expected to fly it when deployed. It is also the point at which the entire crew of the helicopter (which can include pilots, observers and aircrew men) train together. Helicopter OCUs are located at six bases in the UK and, whilst the training tends to be administered by a single service, elements of the syllabus are set by the headquarters (Navy Command, Air Command or Joint Helicopter Command) under whose operational command the particular aircraft type falls. These are:

- **RNAS Yeovilton**—Royal Navy Lynx Mks 3 and 8, Sea King Mk 4 (approx. 40 weeks)
- **RNAS Culdrose**—Royal Navy Merlin Mk 1, Sea King Mks 5 and 7 (all approx. 40 weeks)
- **SAAvn, Middle Wallop**—Army Lynx Mks 7 and 9 (22 weeks\(^9\)), Apache (approx 52 weeks) and Gazelle (approx. 7 weeks)
- **RAF Benson**—RAF Merlin Mk 3/3a (approx. 26 weeks) and Puma (approx 20 weeks)
- **RAF Odiham**—RAF Chinook (approx. 26 weeks)
- **RAF Valley**—RAF Sea King Mk 3/3a (approx. 26 weeks)

3.12. OCU Training focuses initially on flying and operating the aircraft safely (Conversion to Type Training) before moving onto role specific training (Conversion to Role). Dependent on the helicopter, role specific training may include low-level tactical flying, mountain flying, use of sensors, prosecution of targets, naval gunfire support, artillery support, tactical insertion, insertion of boarding parties, night operations, Search and Rescue and transport of loads. The length of OCU Training depends on the sophistication of the aircraft’s systems, the specialist role skills required and the training which aircrew have received during SEARW/MEARW training.

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\(^8\) With the exception of Royal Navy observers who receive their role-specific training separately at RNAS Culdrose.

\(^9\) As of June 2009.
Operational Training and the Unit Training Cycle

3.13. On completing their OCU training, newly qualified aircrew join their operational unit. At this point they are considered to be Limited Combat Ready. Over the course of their first year with their operational unit they will progress through all the roles which they will be required to perform on operations working towards reaching a Combat Ready level of competence.

3.14. The training of newly qualified aircrew falls into the ongoing training cycle which all aircrew within the operational unit undertake. It is carried out on both an individual and a collective basis.

(a) Individual Training—consists of the maintenance of Currency in the flying of the aircraft and of Competency in a wide range of flying skills from the use of Night Vision Goggles to mountain flying to maritime crash drills, dependent on the aircraft’s operational role. 

(b) Collective Training—brings together the individual training of aircraft crew members with the capability provided by other platforms such as aircraft, ships, or ground units. Prior to deploying on operations, units undertake intensive collective Pre-Deployment Training tailored specifically for the operations they will undertake and the operating environment they will encounter on deployment. Pre-Deployment Training encompasses a range of training programmes including the refreshment on non-aircraft specific military skills, intelligence and operational briefings, and joint exercises—where possible with units also deploying to the same theatre of operation.

Royal Navy Air Engineering Training

Officers

3.15. Potential Royal Navy Air Engineer Officers initially undertake the Systems Engineering Management Course (Air Engineering) at the Royal Naval Air Engineering and Survival School (RNAESS) at HMS Sultan. The course involves 45 weeks of foundation training for Direct Entry Graduates during which students are provided with an induction to generic aeronautical engineering and squadron engineering management. Training at HMS Sultan takes 24 weeks for Senior Upper Yardsmen, who in all cases will have previous experience of air engineering during their careers as Air Engineering Technicians. The Systems
Engineering Management Course (Air Engineering) is then followed by workplace-based training in the form of Certificate of Competency (CoFC) training at an Air Station. This training allows students to consolidate their knowledge within a squadron environment and obtain platform specific aircraft knowledge; this training takes four months for Direct Entry graduates and two months for Senior Upper Yardsmen. On completion of their CoFC training, students undertake a CoFC Board and if successful will attain the status of qualified Air Engineer Officer with the majority immediately taking up their first compliment Front Line engineering appointments. Further training in the next stage of an Air Engineer Officer’s career and prior to their change of appointment is also undertaken.

Air Engineering Technicians

3.16. Having completed the Phase 1 training undertaken by all ratings, trainee Royal Navy Air Engineering Technicians undertake 22 weeks of specialised Phase 2A Air Engineering training at the RNAESS, HMS Sultan; this training covers a generic introduction to aeronautical engineering, aircraft maintenance and support and squadron organisations. Provided they pass assessments, the trainees then progress to Phase 2B training on a specific aircraft type at an air station for 23 weeks to consolidate their knowledge and gain platform specific knowledge. If successful during both phases of training, ratings attain the grade of Operative—Qualified to Maintain (particular to aircraft type) and Qualified to Sign (confirmations of airworthiness)—and are assigned to an operational unit. After a period of time, Royal Navy Air Engineering Technicians usually then go on to promotion and more advanced training in one of two specialisations: Mechanical Trade Engineering or Avionics Trade Engineering. Dependant on the level of advancement, this training always includes a period at RNAESS, which may then be followed by a period of consolidation training and assessment at an air station. Competency to operate is assessed against a Tri-Service competency matrix.

AAC Groundcrew Training

Officers

3.17. Traditionally, the AAC Officers in Command of Ground Support Flights have been Late Entry officers with the experience of working as ground crew during their soldiering careers. From January 2010 the AAC will start recruiting some Direct Entry groundcrew officers from the Royal Military Academy Sandhurst. A bespoke Ground Support Flight Commanders Course will be delivered by SAAvn at Middle Wallop to both DE and LE ground support officers.

Non-Commissioned Groundcrew

3.18. Having completed the Phase 1 training undertaken by all AAC soldiers, potential ground crew carry out their Phase 2 Training at 2 (Training) Regiment ACC at Middle Wallop. After an initial induction package the soldiers will stream into to specialisations: Communications (signals) Specialists and Groundcrew Specialists. Training for the latter concentrates on all aspects of re-fuelling, arming and moving aircraft. In total, the Phase 2 training takes between 28 and 30 weeks and on its completion the soldier is considered a qualified Class 3 ground crew. Further training is carried out with their unit to bring the soldier up to a Class 2 level of competence. After 12 to 18 months the ground crew soldier returns to 2 (Training) Regiment at Middle Wallop in order to complete their advanced and trade-specific Class 1 training.

REME Aviation Training

Aviation Engineering Officers

3.19. The Royal Electrical and Mechanical Engineers (REME) deliver the Army’s qualified aviation engineering capability. A six to seven week Enhanced Phase course at the Royal Military College of Science at Shrivenham provides REME Engineering Officers with an induction to aeronautical engineering prior to their undertaking the seven month Officers Long Aeronautical Engineering course at the Defence College of Aeronautical Engineering (DCAE) at Arborfield. From the DCAE, they will join their operational unit and, following a period of around four months with their unit they will attend a Viva Board at HQ Director of Electrical and Mechanical Engineers (Army) and if successful they will attain the status of Aviation Engineering Officers.

Aviation Technicians

3.20. Having completed the Phase 1 training which all REME soldiers undertake, those wishing to pursue a career as REME Aviation Technicians begin their Phase 2 training at the School of Electronic and Aeronautical Engineering (SEAE) at Arborfield. The Aviation students take common induction and foundation courses over their first 15 weeks, before being streamed into two Aviation specialisations: Aircraft Technician and Avionics Technician. Aircraft Technician students move to the DCAE where they undertake vocational training while Avionics Technician students continue at SEAE to complete a 25 week Basic Electronics course before they too undertake vocational training at DCAE. Vocational training takes 47 weeks for Aircraft Technicians and 41 weeks for Avionics Technicians. The technicians then move on to Phase 3 of their training, completing any necessary platform-specific Equipment Courses before moving on
forces and the dusty and, in the summer, hot and high altitude conditions have required the Department to adapt and respond quickly to unforeseen requirements specific to particular operational environments and emerging threats—for example as a result of the enemy forces' developing techniques, tactics and procedures.

Theatre Entry Standard UORs

3.28. Because UORs are by nature unforeseen and theatre-specific, it is not possible to predict them in advance; instead capabilities are delivered through the UOR process when the requirement emerges. The required capability is then fast-tracked to the front line.

Chinook Mk 3 Reversion Programme

3.29. In 1995, the Department ordered 8 Chinook Mk 3 helicopters for special operations but, due to well-reported technical problems, they have remained unavailable since their delivery in 2001. On 30 March 2007, it was announced by the then Chancellor that, as part of a package of investment in the Department’s battlefield helicopter fleet, the Chinook Mk 3 aircraft would be converted to a battlefield Support Helicopter role. The Reversion programme is being taken forward through the UOR process with the Department funding the majority of the Reversion work and HM Treasury funding the theatre modifications. The result of the Reversion Programme will be an increase in the Chinook fleet of 20% and the fielding of the aircraft two years earlier than would have been the case under the previous plans to resolve the technical problems.

Theatre Entry Standard UORs

3.30. The Department’s helicopters are fitted with equipment to allow them to fulfil the role which they will be required to perform across a range of operational environments and against a range of threats. However, the fitting of additional “Theatre Entry Standard” equipment may be required to meet the threat and environmental conditions which may be encountered in a specific theatre. This has been the case in both Iraq and, in particular, Afghanistan, where the sophisticated and changing nature of the threat from hostile forces and the dusty and, in the summer, hot and high altitude conditions have required the Department to
carry out several Theatre Entry Standard modifications under HM Treasury-funded UORs. These include the fitting of improved Defensive Aids Suites to several platforms and equipping both the Royal Navy Sea King Mk 4 and the RAF Merlin Mk 3 helicopters with new main rotor blades and Display Night Vision Goggles (the work on the Merlin Mk 3 is ongoing). The Department is also upgrading its 22 current Lynx Mk 9 aircraft with T800 engines, 12 under a HM Treasury-funded UOR and has now secured. These more powerful engines will enable Lynx Mk 9 to provide a year-round Light Helicopter capability, including during the summer months when it is currently unable to operate.

Merlin Mk 3a

3.31. In addition to the significant number of UORs that it has completed, MoD has also taken urgent action under its standard processes where an urgent requirement for more helicopter capability has been identified. In July 2008 the Front Line Commands took delivery of six Merlin Mk 3a Medium Lift helicopters. These aircraft were acquired from the Danish Government in order to provide a 25% increase in the RAF Merlin fleet more quickly than would have been possible through a conventional procurement route. The Merlin Mk 3a, have been fitted with state of the art new main rotor blades and sensors and have been absorbed into the IMOS contract. The RAF’s Merlins are currently committed to Iraq, but once their mission there has ended, the Department intends to deploy them to Afghanistan as soon as practicable.

Maintenance in Support of Current Operations

3.32. The process by which helicopter airframes are supported and the priority which the Department places on delivering flying hours to meet operational tasking requirements is outlined in Section 2.

3.33. At any one time, a percentage of the total Departmental Fleet will be undergoing routine scheduled Depth maintenance and some aircraft will also be undergoing Theatre Entry Standard modifications and upgrades to ensure they are capable of operating in current theatres and against current threats. The number of aircraft in the Forward Fleet (those available for training, standing commitments and operational use) is therefore dictated by these essential maintenance and modification functions.

3.34. Serviceability is not solely an equipment issue, being also dependent on the performance of many aspects of support, including spares availability and the expediency of the supply chain, and the availability of appropriately trained Front Line Command manpower. MoD is continuing to increase the numbers of available maintenance personnel in support of current operations to provide better resilience for the deployed units. The Department has also introduced improved In-Theatre logistics support, including the increased use of Deployable Spares Packs and it is actively ensuring that commanders have appropriate/optimum stock types and levels in theatre. MoD is also taking forward work to improve the cost effectiveness of its support solutions, including adjustments to the Lynx In-Service Support Arrangement and for the engines of the Sea King fleet.

Improvement in Flying Hours—Afghanistan

3.35. The UORs which the Department has delivered, and the improvements in logistics and maintenance support both in theatre and in the UK have had a tangible effect on the number of hours made available to commanders on the ground in Afghanistan. As of April 2009, the Department has delivered the following percentage increases in helicopter flying hours in Afghanistan, when compared to November 2006.

<table>
<thead>
<tr>
<th>Helicopter</th>
<th>Total Increase</th>
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<tr>
<td>Apache</td>
<td>43 per cent</td>
</tr>
<tr>
<td>Chinook</td>
<td>50 per cent</td>
</tr>
<tr>
<td>Lynx Mk 7</td>
<td>25 per cent</td>
</tr>
<tr>
<td>Sea King Mk 4</td>
<td>Not deployed in October 2006</td>
</tr>
<tr>
<td>Total</td>
<td>84 per cent</td>
</tr>
</tbody>
</table>

3.36. The Department intends to make further significant increases in total year-round helicopter flying hours following the introduction of RAF Merlin by the end of 2009 and re-engined Lynx Mk 9 in 2010.

SECTION 4: THE ROLE PLAYED BY HELICOPTERS ON OPERATIONS

This section includes classified information and is therefore provided as a separate classified annex.

23 April 2009
Supplementary memorandum from AgustaWestland

1. The reliability of aerospace equipment is typically quoted as a mean time between faults expressed in flying hours. For a helicopter main rotor gearbox two values should be considered of most significance.

2. Firstly, Mean Time Between Faults (MTBF) which is the overall time between faults, including those that can be corrected with the gearbox installed in the helicopter. Secondly, Mean Time Between Unscheduled Removal (MTBUR) which is the time between faults which require the gearbox to be removed from the helicopter and returned to a depot for deeper level repair.

3. For a helicopter the most important measure is the MTBUR as too many arisings will cause the aircraft to be out of service for longer than planned as the gearbox has to be removed which causes additional work. For a Merlin helicopter using data available to AgustaWestland from the MoD’s logistic systems covering the period 2005 to 2008 the MTBUR for Merlin was 1546 hours. If a comparison is made to the Sea King for the same period the MTBUR for this aircraft was 1726 hours.

4. AgustaWestland has designed and qualified a series of 20 modifications to improve the reliability of the Merlin Main Rotor Gearbox and to also extend the time between overhauls from 2000 to 3000 hours. These modifications are now being installed in gearboxes as they are returned for repair and overhaul.

1 June 2009

Memorandum from UNITE

This response is submitted by Unite. Unite is the UK’s largest trade union with almost 2 million members across the private and public sectors. The union’s members work in a range of industries including manufacturing, aerospace, shipbuilding & repair, financial services, construction, transport, education, health and not for profit sectors.

EXECUTIVE SUMMARY

— The Ministry of Defence must seriously consider replacing the current ageing Puma with sixteen new Merlin Mk3a aircraft.

— This proposal will rationalise the Medium Support Helicopter fleet from 3 types to one, reducing costs and making economic and financial sense to the Treasury and the tax payer.

— Unite has serious concerns about the safety of Puma, the main concern being its poor engine response.

— If the programme is implemented, any transition period will not impact upon operational capability, as there will be no loss of aircraft as they enter into an upgrade programme.

— The proposal for Merlin will ensure a bigger footprint for UK based companies. As well as providing contracts for Augusta Westland, the engines will be manufactured by Rolls-Royce.

— The procurement of Merlin would ensure the maximum retention and creation of jobs for workers based in the UK.

— The key technical skills required to make these complex pieces of machinery will be retained in the UK and will ensure skills shortages and skills gaps are controlled.

— The proposal could deliver acquisition savings of more than £300 million against the Future Medium Helicopter Tranche 1 and Life Extension Programme budgets.

1. INTRODUCTION

1.1. Over the past three decades the UK Aerospace industry has undergone a series of significant changes and strategic re-structuring. The two most important changes have been the rapid globalisation of manufacturing industry and the changes to production and capability in the face of the UK armed forces being involved in two major military conflicts.

1.2. The sector is the second largest in the world and is a significant driver of regional, national and global economic growth and productivity. The industry generates £38.6 billion worth of revenue and exports of £4.34 billion. The Aerospace sector employs a workforce of over 124,000 people and supports a supply chain of over 100,000 people. Unite represents around 100,000 workers within the Aerospace industry.

1.3. The sector has a number of large key companies but also has a diverse and strategically important supply chain of small and medium sized enterprises (SMEs). These workplaces are incredibly important to the success and productivity of the Aerospace sector and Unite acknowledges the key role SMEs play in ensuring that the UK Aerospace sector remains one of the most successful in the world.

2. PUMA LIFE EXTENSION PROGRAMME (LEP)

2.1. Unite believes the Puma LEP is a stop-gap measure to provide an interim “Battlefield Medium Support Helicopter” capability before the MoD can procure a new helicopter when funds become available in 2022.

2.2. Unite has concerns that there are serious issues around the safety of Puma. The main concern with the current Puma is its poor engine response. A demand by the pilot for too much power too quickly causes the rotor speed to drop resulting in a consequent loss of lift. To overcome some of the known failings the Ministry of Defence (MoD) has decided that the aircraft needs a new more powerful engine. This in turn will require a new cockpit because of the need to fit modern digital engine controls.

2.3. Unite believes this will not solve the problem. Although some handling characteristics will be improved other poor safety features cannot be rectified. For example, the aircraft has a high centre of gravity and, when combined with a short wheel base and tricycle undercarriage, this makes the aircraft prone to rolling over especially in high winds and when operating from uneven landing sites. It is this feature that makes the aircraft unsuitable to operate from the back of ships.

2.4. Added to this, Unite believes the aircraft has not been designed to meet modern safety standards. It is only built to a 6g crash case, whereas the Merlin for example is designed to survive a 16g crash. Roughly translated this means that only 40% of Puma crashes would be survivable whilst with Merlin the crew and passengers would survive in excess of 90% of all crashes. As well as this, the Puma LEP upgrade does not include the fitting of modern crashworthy seating.

2.5. Unite believes these safety issues cannot be resolved. Crashworthiness is all about achieving a balanced design where no one feature compromises the capabilities of others. A crashworthy seat is great to have but only if the basic airframe does not collapse in a crash. Optimised crashworthy design cannot be achieved retrospectively on a legacy platform. Partial incorporation of crashworthy design features may be a benefit to survival rates but are likely to generate significant design change and weight growth penalties that must be factored into the overall operational performance.

3. CAPABILITY

3.1. The capabilities that are needed now are vastly different to those envisaged 50 years ago when the cold war was the greatest threat to UK national safety and security. What this has created is a scenario where it is the technological advantage that is needed by the UK armed forces.

3.2. This level of technological change and expansion has created new ways of working and the creation of new industries and new technologies. Part of this creation has been developed by the small and medium sized enterprises (SMEs) in the sector. This is where the technological innovation is to be found and where there are significant levels of intellectual property and the ability to provide solutions for the big companies that dominate the UK Aerospace sector.

3.3. Through life capability is vitally important at this crucial time. There has been a critical change of approach regarding national security within the UK, the USA and other areas around the world. This impacts significantly on Unite members and the strategic long term objectives of the companies they work for. Unite is keen for the present government to focus on capability as an issue within the sector.

3.4. Strategic and focused investment will secure the jobs, skills, livelihoods and communities of the workers in the sector. The Aerospace sector is a unique niche sector. The workers within the sector are highly skilled, highly educated and have undergone extensive training. The work they do is not undertaken anywhere else in the UK and is of vital importance to the UK economy and the UK balance of payments.

4. AIRCRAFT PROCUREMENT

4.1. Unite believes it is highly likely that, should the Puma Life Extension Programme commence, a good deal of emergent after-work will be identified, which could have a detrimental impact on controlling costs. Experience gleaned from an earlier programme to upgrade South African Pumas for the MoD showed that of the originally procured 6 aircraft only 4 could be made suitable for operational service. There are also known issues with the top deck structure which supports the main rotor gearbox and engine where repair costs are high.

4.2. Unite is clear that capability is of strategic importance where government procurement is concerned. The MoD has a poor record of implementing procurement contracts on time and ensuring that strategic military equipment is available for the armed forces. The National Audit Office has provided evidence to show that delays in procurement can end up costing the UK government and the UK tax payer far in advance of the original budget.
4.3. Quentin Davies, Minister for Defence, Equipment & Supply (DE&S) recently announced a study into the potential procurement of new aircraft in place of both the Puma and Sea King Life Extension Programmes (LEPs). There are major benefits associated with the introduction of further numbers of helicopters to enhance the existing fleet of helicopters currently used by the MoD. Unite believes the most pragmatic alternative to having two LEPs is to increase the current Merlin Fleet by 44 aircraft.

5. **Skills and Training**

5.1. It is clear that the Aerospace sector is one where the employees are highly qualified and highly skilled. However, a number of key reports have indicated that a shortage of skilled employees may be hampering growth in manufacturing industry as well as limiting the potential for any changes in highly technical operational processes. Unite believes that procurement decisions by the MoD must take into account training, skills and ensuring the key skills in the sector are retained. Long gaps in the awarding of contracts can generate serious problems with skills retention and skills shortages.

5.2. Unite is keen to see that companies within the sector do not become complacent about training their existing workforce. It is vital for workers to continue their training and development while in work and it is the employer’s responsibility to ensure that the workforce has this opportunity. Skills gaps can become a serious issue within manufacturing companies and as such could seriously affect productivity.

5.3. The present government has made it clear that they want to see a highly educated and highly skilled workforce for the future growth and prosperity of the UK economy. There are two key factors driving demand for skills within this sector.

5.3.1. Replacement demand—where job opportunities are created by retirement, occupational mobility and where there are skills shortages within the sector.

5.3.2. Structural change driven by international competition—the important role of skills in improving productivity relative to international competitors cannot be underestimated. Structural change within the sector, such as the huge changes in technology and the products required by the armed forces, are broadening the types of skills required within the sector.

5.4. Unite believes that ensuring strong workforce skills is a matter of shared responsibility between government, employers, unions and individuals. It is clearly documented that trade unions have played a pivotal role in encouraging workers and employers to participate fully in the learning agenda, this role can now be extended to include on the job training and skills development for all workers.

**Unite Recommendations**

— The Ministry of Defence must give serious consideration to replacing the current ageing helicopters with modern aircraft that will have up to a 40-year operational expectancy, and which are designed to contemporary safety and survivability standards.

— As an element of the proposal, replace the current Puma capability with 16 new Merlin Mk3a aircraft within the same budget and profile.

— Rationalise the Medium Support Helicopter fleet from three types to one, with the removal of costs associated with the support and maintenance of the current Puma and Sea King Mk4 aircraft.

— Unite believes the transition period will incur no impact upon operational capability as there will be no loss of aircraft as they enter into an upgrade programme. The Puma fleet will diminish significantly as aircraft are returned to Romania for structural rework followed by new electrical and avionic equipment being installed.

— The proposal could deliver acquisition savings of greater than £300 million against the Future Medium Helicopter (FMH) tranche 1 and Life Extension Programme budgets.

— By increasing the fleet size of an already utilised aircraft, this will reduce the direct cost of ownership of the Merlin helicopter by 28% through economies of scale and also build on significant UK investment in the Merlin helicopter.

— Implementing the programme will remove or significantly reduce the requirement for further investment in training, infrastructure, independent test and evaluation, trials and MoD Project Team costs, while avoiding the costs, risks and delay associated with bringing new aircraft types into service.

— Accepting the upgrade of Merlin will ensure a bigger footprint for the UK workforce as Rolls Royce will be supplying the engines.
— Unite believes the implementation of the upgrade will provide for the retention and creation of jobs in the aerospace sector.

— All equipment procured by the MoD must be manufactured in the UK, using UK based workers.

26 June 2009