



the
Ministry of Defence
Policy Papers



MINISTRY OF DEFENCE

Paper no 5

Defence
Industrial
Policy

Ministry of Defence Policy Paper

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Policy

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Paper No.5

Defence Industrial Policy

Foreword

A thriving, innovative and competitive defence industry is essential for the defence of the UK. It is the primary source of world-class equipment for our Armed Forces. We are delighted to launch the Government's new defence industrial policy aimed at enhancing the competitiveness and sustainability of the UK defence industry, while continuing to provide high



Lord Bach

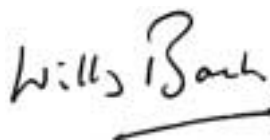


Alan Johnson

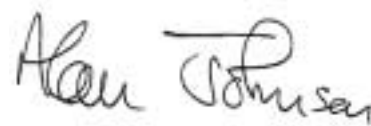
quality equipment at best value for money. The industry is a key part of our economy, contributing significantly to our balance of trade and employment. The UK's innovative science base supports the defence industry's high levels of technology development, and this brings benefits to other industry sectors through the application of military technology to civil products. Our policy reflects the high regard that we have for the defence industry and underlines our continued commitment to it.

The Government's new policy responds positively to a rapidly changing global defence market. In developing the policy we have consulted industry through the National Defence Industries Council and we share much common ground. The policy builds on the improvements that have been made through Smart Acquisition and complements the Government's manufacturing strategy and sectoral initiatives, such as the Aerospace Innovation and Growth Team.

The Government and industry are moving forward together as the strategic environment continues to evolve, building on industry's strong success in wider markets and further enhancing the capabilities of our Armed Forces. We commend this policy to you, which we are committed to implementing in close co-operation with industry.



Lord Bach, Minister of State for
Defence Procurement



Alan Johnson MP, Minister of State for Employment
Relations, Industry and the Regions

Key conclusions

The Government's defence industrial policy is driven by the need to provide the **Armed Forces with the equipment which they require**, on time, and at **best value for money for the taxpayer**.

We seek to maximise the economic benefit to the UK from our defence expenditure, a **healthy and globally competitive defence industry** and the development of a high-value technologically-skilled industrial base, consistent with the Government's wider manufacturing strategy.

The UK defence industry **embraces all defence suppliers that create value, employment, technology or intellectual assets in the UK**. This includes both UK- and foreign-owned companies.

Restructuring of the defence industry brings increasing commercial opportunities for UK companies, and economic and technological benefits through inward investment into the UK. The UK industry cannot grow by meeting domestic requirements alone, nor can all the technologies required by the Armed Forces be sourced solely from the UK. **We will not constrain UK companies** from expanding into new markets, except where national security clearly requires otherwise.

We will be **more transparent and inclusive, from the early stages of a procurement project**, about the factors that affect acquisition decisions. As far as possible, we will declare them to potential bidders at the outset to enable them to frame their bids accordingly. We will assess the aggregate impact of decisions on the defence industrial and technological base.

Open and fair competition remains the bedrock of our procurement policy. It is the most effective means of achieving value for money and of developing an efficient and innovative defence industry. But we will not use the competitive process beyond the point where it can offer long-term advantage, and we will use other approaches where these offer better long-term value for money. We will **seek to provide a more appropriate risk/reward ratio** for programmes with high technological risk; and we are committed to **public/private partnerships** to deliver benefits in the provision of defence services.

Protectionism is not a viable way forward, but we recognise that not all governments approach acquisition with similar openness. We will continue to press for **freer access to overseas markets**. We aim to **improve the flow of defence information and technology across borders**, and to enable the UK defence industry to compete on merit in other markets. We will continue strongly to support defence exports, and we have agreed to set up a new **defence exports and market access forum** to address export promotion and improved access for UK industry into foreign markets.

Investment in **research and technology** is crucial to the future prosperity of the defence industrial base and the capability of the Armed Forces. We will work with industry and academia to co-ordinate our joint resources, to maximise exploitation of civil technology, and to target our investment into areas of military importance in which UK industry can be global leaders. This investment must then be pulled through into early technology de-risking of specific projects. We will also seek to avoid duplication of effort with our allies, improve access by industry to foreign technology, and increase the proportion of research collaboration.

We will review our defence industrial policy continuously as the strategic environment evolves, in consultation with industry through the National Defence Industries Council. We are committed to maintaining a **close dialogue with industry** in maintaining a comprehensive view of UK defence industrial capabilities, and to work together with industry to monitor progress and deliver results.



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DEFENCE INDUSTRIAL POLICY

INTRODUCTION

1. In recent years defence has experienced profound change. The global political context has altered dramatically, and the nature of military operations and of the equipment and technology required to support these has similarly been transformed. A manpower-intensive, platform-heavy and predictable doctrine has been replaced by the requirement for sophisticated, rapid and precise military solutions. The UK Government's response to the new strategic environment, and the drive for greater efficiency, culminated in the Strategic Defence Review and in particular the Smart Acquisition reforms. These have placed new demands on a defence industry already changing globally in response to new market conditions, and a new emphasis on closer co-operation and openness in our relationship with industry. The ongoing consolidation of the defence and aerospace industries, dominated by a few giant companies and a multiplicity of international joint ventures, has major implications both for the future of an exclusively "national" defence industry and for competition.
2. The Government is responsible for providing the Armed Forces with high quality equipment at best value for money for the taxpayer. It is also firmly committed to the UK manufacturing sector, and to promoting a strong and competitive UK defence industry, bringing economic and technological benefits to the nation. The Government must take decisions within a policy framework that recognises any tensions between these two objectives. We have re-evaluated our defence industrial policy in consultation with industry, against the background of the new industrial context and industry's concerns about their future health, and in light of the Government's recently published manufacturing strategy. We have aimed to develop new strategies to take account of the transition to an evolving international defence market.

The importance of the UK defence industry

3. The defence industry is a major contributor to the economic well-being of the UK. It has a turnover of some £15 billion per annum and provides high-value employment, technology innovation and exports. It is a core element of the UK manufacturing industry, a sector which accounts for 20% of the UK's gross domestic product and directly employs over 4 million people. The defence industry employs some 345,000 people directly and indirectly in the UK, and provides around 3% of the UK's manufacturing output. It is also essential to equipping and supporting the Armed Forces to world-class standards, delivering high technology, battle-winning equipment and supporting services. The Government remains the single largest customer for the UK defence industry's output. The UK has also led the way in encouraging an open and competitive defence market, improving the industry's efficiency and effectiveness, and increasing the value for money for the taxpayer.
4. The scale of exports underlines the quality of the equipment and services provided by UK industry. In 2000 it won export orders worth £4.7 billion (set against imports of £1,660 million), and over the last five years has achieved a global export market share of 21% - second only to the US defence industry. The UK is the principal overseas supplier to the US: industry wins orders worth some \$1 billion a year from the US government, accounting for

about half of the US total overseas defence procurement spend.

5. British companies of all sizes play leading roles in the development of cutting edge equipment, providing the UK's Armed Forces with the capabilities that they need, from the smallest items through to fully integrated systems. The Joint Strike Fighter (JSF) programme clearly demonstrates the competitiveness of UK industry in the international marketplace. The UK Government is investing £1.4 billion in the collaborative development of the aircraft, but did not demand workshare on this programme; even so, UK industry is winning a significant share of the work at least equal to the Government's contribution in an intense competition.

A global background to the defence industry

6. During much of the past century, the common model of a defence industry was of industry as an element of national sovereignty. Companies were often state-owned, and close control by large state procurement organisations defined technical needs, oversaw development and production, and imposed unique contractual and accounting restrictions. This was considered necessary to ensure security of supply, economic and employment benefits, and some technological spin-off to the civilian economy.
7. Nevertheless, this pattern was already beginning to break down before the end of the Cold War. Governments began to pool their national industrial resources in large collaborative projects. In the 1990s new market conditions emerged, brought about by constrained budgets, increasingly technologically advanced solutions and the drive for greater efficiency. These market conditions have forced radical restructuring within and across national boundaries. This has been prompted largely by the acceptance of commercial logic, but with the support of governments as regulators. Governments have also sought to improve the climate for industrial restructuring, and to remove some of the distortions from defence markets, through international agreements (see paragraphs 35-40). Governments still exercise influence as the primary customer of their defence industry.
8. In the United States, changing market conditions have prompted the consolidation of the industry into a handful of "super" prime contractors: Boeing, Lockheed Martin, Raytheon and Northrop Grumman. Within Europe, although major companies such as BAE Systems and European Aeronautic Defence and Space Company (EADS) have emerged, the general pattern of industrial restructuring so far has been to create joint ventures – MBDA, Agusta-Westland – rather than consolidation on the US model. This reflects Europe's history of collaborative programmes, and allows a degree of national control to be retained. The disadvantage is that it is more difficult to create synergies and strong managerial structures. Some European companies have also widened their markets by investing into the industries of other countries, presenting themselves as multinational companies with more than one national identity: notably BAE Systems, Rolls-Royce and Thales, but with smaller companies also having significant interests abroad.
9. Consolidation and globalisation at the level of prime integrators, as well as of sub-primes or specialist high level sub-systems suppliers, look set to continue if defence companies are to remain profitable and retain the capability to undertake large defence projects. Cost and capability pressures on national governments will not diminish, and even the US may struggle to retain a wholly independent national capability in all areas of defence. The process of

consolidation has not concluded, and companies, responding to the need to position themselves in a changing market, will continue to seek restructuring opportunities. Mutual interdependence will continue to grow.

New outlooks in the UK defence industry

10. Since at least the 1960s, the British defence market has been too small economically to support a comprehensive defence industrial base. Although the UK defence industry's global position is impressive, industry needs to continue to adapt. Industry's response has ranged from establishing a foothold in the US defence market to the creation of European defence companies. The US is the most important creator of new defence technology, and there is an increasing disparity between its defence spend and that of Europe. US defence spending this year is forecast to be 2.6 times the total of all EU nations, and this \$348 billion is planned to grow to \$413 billion by 2005. In some cases the US can provide the only economic route to the acquisition of a capability. However, despite investment by UK companies, obstacles to entry into the American market are still significant. Europe's market lacks the integration and the size of the US market, and its combined investment in research and technology is much smaller. However, there are significant potential benefits to be gained from a better functioning European market, a more efficient supplier base, and better prioritisation of research and technology budgets in Europe, providing this can be implemented without damaging transatlantic co-operation.

THE SCOPE OF THE UK DEFENCE INDUSTRY

11. One result of the defence industry's internationalisation has been to blur the definition of what comprises the UK defence industry. An increasing number of companies with foreign parentage now have British boards and workforces. Likewise, traditionally UK-based firms have growing operations outside the UK industrial base. Foreign-owned companies that set up in the UK can bring benefit in creating technology, employment and intellectual assets in this country. Expansion abroad by UK-owned companies may also realise similar benefits here, if it provides a route for technology and economic benefit to flow back to the UK. The UK defence industry should therefore be defined in terms of where the technology is created, where the skills and the intellectual property reside, where jobs are created and sustained, and where the investment is made. The desire to attract the benefits of inward investment for the long term can in most cases be best addressed by promoting a favourable business and economic environment, thereby increasing the creation of economic activity and exploitable and dependably available technology within the UK.
12. Defence acquisition has rapidly broadened in recent years from the procurement of equipment to contracting for services and support functions to include the provision of training, IT support and main platform maintenance, and the use of Public Private Partnerships. The increased involvement of industry in the direct support of operations (for example through contracting for the availability of defence systems) has had a major impact on companies which traditionally were part of the manufacturing sector (Vosper Thornycroft now has higher turnover in service

provision than in shipbuilding). MoD's defence industrial supplier base has also diversified beyond these companies to encompass specialist service providers.

13. Industry has reached similar conclusions on the nature of the UK defence industrial base, and the UK subsidiaries of foreign-owned companies are fully represented within the relevant UK trade associations. Similarly, the major UK-based companies have argued strongly that nationality of ownership or control is much less relevant or strategic than in the past. When BAE Systems and Rolls-Royce were privatised, the Government retained special shares which restricted share ownership by overseas investors to an aggregate of no more than 49.5%, in order to protect national security. This limitation now imposes unnecessary restrictions on the companies' access to equity, stifling their operations and growth. It is also inconsistent with the drive for fair and open markets and the need for British companies to find new markets abroad. In April 2002, the Government agreed that this restriction should be removed from the Articles of Association of both companies. The 15% limit on individual foreign shareholding was retained to prevent outright control by a single foreign individual or organisation. At the same time, the requirement for all board members of BAE Systems to be UK nationals was also relaxed. Both BAE Systems and Rolls-Royce have thus been able to fulfil their need to increase foreign share ownership (now over 50%), consistent with their status as international companies.
14. Although the wider public and media still perceive the defence industry and defence equipment in national terms, almost all major systems now contain components sourced from a range of foreign companies. We will continue to publicise the multinational reality of the industry and the benefits which this brings.

ACQUIRING CAPABILITY FOR THE ARMED FORCES

15. The Government's defence industrial policy is founded on the importance of equipping our Armed Forces efficiently with the tools they require to meet the challenges they face. Each year a large proportion of the defence budget is spent on procuring and supporting equipment. It is these activities that in effect define and delimit our industrial policy. Above all, our relationship with the defence industry must be rooted in **project performance** – ensuring that reliable and supportable equipment is developed and delivered within time and price constraints. It is not just the magnitude of Government defence spending but the efficient use of those defence resources that enables the UK to have the most effective armed forces in Europe. It is not in the interests of the taxpayer or our Armed Forces for an industrial policy to dilute this fundamental principle.
16. Within this context, the Government seeks to maximise economic benefit to the UK from defence expenditure, by the development of technological skills, the creation of intellectual property, and an increase in the investment in the UK industry derived from exports. The Government recognises the contribution that a vibrant and innovative defence industry makes to employment, the economy and the national science and technology base. In particular, we aim to sustain an environment which will enhance the competitiveness of industry.

Value for money in acquisition

17. Defence procurement strategies and investment decisions involve a range of factors which together ensure that the best value for money solution for the Armed Forces and for the taxpayer can be identified. The table below sets out the four fundamental factors.

Table 1. Key factors taken into account in acquisition decisions

- ◆ MoD has a responsibility to achieve the best value for money from its equipment programme and this forms the core of the evaluation. The assessment of the **cost and operational effectiveness** of project options (including an assessment of the timescales involved in delivering the capability to the frontline) will therefore always remain the principal focus of our decision-making. Estimates of **whole life costs** and the evaluation of **risk** have increasing emphasis in this assessment. This includes a judgement of the capability of a supplier to manage technological and commercial risks.
- ◆ The solution must be **affordable**.
- ◆ **Long-term value for money** is wider than that for individual projects. Competition is MoD's primary means of achieving value for money, and any decision which would impact on the ability to compete future requirements – for example, by creating a monopoly at prime or even sub-contractor levels – needs to be considered very carefully.
- ◆ There are a very small number of capabilities which for **national security** reasons we would place a high priority on retaining within the UK industrial base. Examples exist in the fields of nuclear technology, defence against biological, chemical and radiological warfare, and some counter-terrorist capabilities. Decisions include consideration of whether any of the possible solutions would risk the loss of such a strategic industrial capability.

18. Laid onto the assessment of these key factors is a consideration of the wider defence and national interests. These fall into a number of categories, as set out below.



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Table 2. Wider factors taken into account in acquisition decisions

- ◆ Protecting the Armed Forces' **security of supply** ensures that we are able to support equipment in times of conflict. High levels of onshore technology offer greater comfort in security of supply, and the ability to undertake modifications in response to short-term operational demand. But we have to be realistic about these advantages. An increasing mutual reliance on security of supply is inevitable for all nations; we can manage that risk best through collaborative agreements such as the Letter of Intent Framework Agreement and the Declaration of Principles (see paragraphs 35-40).
- ◆ MoD's science and technology strategy focuses the limited research funds available on investment in certain **key technologies** (see paragraph 43). That investment gives the Government a particular stake in the effect of decisions on those technologies. Key technologies include not only those that are militarily essential to retain, but also those technologies with the most future potential for the UK science base, a base also supported through DTI science, innovation and technology programmes.
- ◆ Future **export potential** can improve overall cost-effectiveness, both by reducing the unit cost (owing to a longer production run) and through the export levy on sales of equipment developed at Government expense. Exports can also improve the economic strength of the defence industry.
- ◆ **Industrial Participation** (the placing of work on UK defence contracts with UK industry) can encourage technology transfer and ensure investment in particular industrial capabilities within the UK. Both quality and quantity of the industrial participation work will be relevant.
- ◆ Decisions should also be consistent with the **wider MoD policy framework**. Certain cases may raise legal issues or be affected by MoD's environmental, security, personnel or estates policies.
- ◆ There are **industrial capabilities** which it is desirable to retain in the UK industrial base not only for defence reasons but owing to the high value which they bring to the industrial economy. Once lost, these capabilities may be difficult to recreate in the future. An industrial capability, at prime contractor level and within the supply chain, can be evaluated according to:
 - ◆ its potential in world markets;
 - ◆ the extent to which it will generate economic activity of a high value-added nature (including its potential for attracting inward investment and for incorporation in collaborative programmes in Europe or elsewhere);
 - ◆ its transferability into wider commercial applications outside the defence sector;
 - ◆ its impact on industrial activity regionally (including the number and quality of UK-based jobs that are created or sustained).
- ◆ Many procurement projects and collaborative ventures can now be so large in scale and political importance that they have significant implications for **foreign and security policy interests**. The nature of the UK defence industrial base can also affect the UK's ability to participate in and influence international collaboration now and in the future.

19. All these issues are considered whenever assessing the merits of bids or of alternative procurement strategies. But the key to ensuring that a chosen procurement strategy is most suited to the circumstances of a particular project is to expose the wider factors which impinge upon that project **at the earliest opportunity**, engaging relevant Government stakeholders from the outset in order to do so. Having thereby set in place the framework for the procurement, we will be in a position to communicate it to industry (see paragraphs 25-26). It is a willingness to carry out proper assessments of wider national objectives early in a project's life that allows us to maintain a robust long-term acquisition programme, to ensure that our approach is coherent, and to deliver both equipment capability for the Armed Forces and long-term economic and wider benefits for the UK.

Competition policy

20. Competition remains the best procurement strategy to deliver value for money for the defence budget. It has undoubtedly brought benefits: it has enabled the provision of world-class equipment for the Armed Forces at an affordable cost and has assisted UK industry in winning competitions overseas. Competition, at both prime and sub-contract level, encourages innovation, flexibility, efficient use of resources, and the development of skills and knowledge. It is only a truly efficient and globally competitive industry that can deliver strong performance.

21. Competition will therefore remain the bedrock of our procurement policy. However, competition does not mean simply accepting the lowest price tender. Deciding best value for money also involves looking at: the performance of the equipment and timeliness of its delivery; the risk involved in achieving the required performance; the sustainability and support costs of the equipment; and the wider factors listed above. The UK will also follow EU procurement law, which requires open competition within the EU for all non-warlike equipment.

22. Value for money is also a long-term concept, and is not simply assessed discretely for each individual acquisition decision. We need to be aware of the aggregate impact of these decisions on project performance and on the industrial and technological base. This impact will be assessed more systematically and deliberately both in our choice of procurement strategies on individual projects and across projects in the longer term. As part of a procurement strategy, we have the opportunity to manage the competitive tendering environment flexibly to achieve the best long-term value for money. This may influence, for example, the timing of down-selection to a single prime contractor, or the degree to which we invest in technology readiness and de-risking before the main project decision point: with limited resources, it is important not to carry on the competitive process beyond the point at which long-term advantage can be gained. For example, design, construction and assembly of the Type 45 Destroyer is being shared between BAE Systems Marine and Vosper Thornycroft, in order to retain a competitive UK shipbuilding industry for the future while ensuring continuity of design and production throughout the class, which should lead to cost savings and fewer delays.

23. We also need to manage technological risk effectively. Burdening prime contractors with unmanageable levels of risk will not lead to efficient project performance. Neither of course does close government control or the protection of industry from the costs associated with normal commercial risk. Whatever degree of risk is borne and managed by the contractor, the Armed Forces will always bear the operational risk of equipment or services that are not delivered on time or to the performance standard required. Investment in de-risking technology,

as a key tenet of Smart Acquisition, is critical to ensuring effective military capability and a healthy defence industry. For example, we are investing around 15% of the Ground Based Air Defence programme funds in advance of the project's demonstration phase in order to reduce risk.

24. Companies investing their own resources in bidding for any contracts are taking a calculated risk upon the outcome of the competition, and this is no different in the defence business. If companies are to be able to judge these risks then it is vital that they have confidence that competitions are fair and transparent. It also benefits MoD to receive competitive bids which are acceptable against all their criteria.
25. Therefore, where wider national interests are relevant to the outcome of a competition, then these will be **declared and explained to potential bidders** as far as foreseeable. This allows industry to frame their bids accordingly, and take account of any factors outside their control at the outset. An example might be a warship building contract, where it is Government policy that for strategic reasons the fabrication and assembly of new Royal Navy warship hulls should be undertaken in UK yards. This policy ensures that the UK retains a national capability to manufacture warships; and, by specifying this condition in advance, the Government is able to select the prime contractor for its future aircraft carrier requirement competitively, while ensuring that bids are based on ship construction work being undertaken in the UK.
26. The **MoD/industry Code of Practice** published last year encourages this positive, equitable and co-operative approach between MoD and its suppliers, and sets out the behaviours and processes that both sides should be entitled to expect before, during, and on completion of the tendering process. We will review the Code of Practice in the coming months to ensure it remains effective.

Partnering

27. Smart Acquisition has engendered a profound change in the relationship between MoD and industry throughout the supply chain. With industry increasingly involved in providing long-term services to the MoD, we have recognised that a partnership approach, building reliable links with our suppliers, is often the best means of realising our goals. The Government is committed to Public Private Partnerships, including the Private Finance Initiative, which are delivering real benefits in the provision of defence services. Partnering does not mean creating privileged or monopoly suppliers, which could stifle innovation and result in inflated prices for inferior equipment. Selection of a long-term partner is often undertaken by means of competition, and is always a painstaking and disciplined process; partnerships must be underpinned by hard commercial reality. But partnership is about basing relationships with suppliers on an open, co-operative means of doing business, identifying and sharing risks and rewards and improving communication. Transparency of information in particular gives suppliers a clearer understanding of MoD's requirements and a more stable basis for long-term company investment. Open dialogue with industry, not least through industry's involvement in the department's Capability Working Groups, provides MoD with many benefits: access to industry's expertise and innovative ideas; earlier identification of problem areas; flexibility to develop the relationship and change requirements over time; and the potential for increased long-term value for money. More detail on the processes involved in partnering is available in the *Ministry of Defence Policy Paper no. 4 – Defence Acquisition*.

Non-competitive procurement

28. Although competition remains MoD's principal method of acquisition, there are occasions when it may not be able to deliver the best long-term value for money or sustain key UK defence industrial capabilities. Currently about 16% by number of all contracts are placed non-competitively, most commonly where spares or upgrades are required, but also as a consequence of the increasing complexities of systems integration work and the reduction in the number of prime contractors who are capable of managing the largest system and platform programmes. Our ability to run competitions, particularly for support services, can be restricted if the scale of long-term investment required in facilities is too high for any single company to undertake without the confidence of a return, or if there is only one supplier with access to key intellectual property.
29. Industry must also play its part in the single source contracting process, recognising MoD's essential requirement to negotiate acceptable performance, cost and time criteria, at an affordable price and incorporating fair terms and conditions. Having decided in favour of a single-source procurement strategy, we will often require prime contractors to utilise competition in selecting their sub-contractors to achieve value for money, while recognising the need to retain key industrial capabilities where present in lower-tier suppliers.

MARKET ACCESS

30. Much of the defence industry is characterised by long product development cycles and high levels of non-recurring cost, set against a pattern of relatively infrequent demand from a small number of customers. The long time between concept and sales makes it difficult to attract private investment, requiring governments to fund most product development work. But a single government rarely has the buying power or the military demand to sustain economic production of the highest value defence equipment as a monopsony. Nor can governments aspire to generate within their national industry the range of technological capability needed to meet their military requirements.
31. It is therefore in the interests of both defence companies and governments to obtain access to wider markets. Governments can assist in this by creating appropriate regulatory environments and by harmonising their military requirements, leading potentially to collaborative projects. Industry plays its part by actively seeking investment opportunities in foreign markets: for example, UK companies have had notable success in penetrating the US market over a number of years, particularly at the sub-system level.
32. Both these approaches have significant obstacles. There is resistance in some countries to allowing foreign companies to participate in their acquisition processes, especially as prime contractors. European collaborative efforts have in the past been dogged by poorly aligned national requirements being shoehorned into a single project, and efficient project performance has often been hampered by an expensive over-emphasis on government intervention to secure domestic political and industrial benefits.
33. One reaction to such obstacles would be to retreat into protectionism, restricting access to the UK market in retaliation for the difficulties faced by British companies seeking markets abroad.

This approach would inevitably destroy the viability of a high-technology UK defence industry and severely damage our Armed Forces' capabilities. Wider market access is crucial to the efficiency of an industry with insufficient domestic customer demand. The UK defence industry, whose exports greatly exceed defence imports, and with its foothold in the US market, would suffer more than most. Despite the existing imperfections of the global market, the UK industry has exploited its opportunities to make significant in-roads abroad: it has established profitable relationships with foreign partners and its products benefit from the international transfer of defence technology. In addition, relatively low expenditure in research and technology in comparison with the US means that the ability to attract US technology is highly desirable both for pulling technology through into UK defence products, and for maintaining the Armed Forces' level of performance, and their ability to conduct joint operations using interoperable equipment. A protectionist approach to defence acquisition would jeopardise industry's success and the military effectiveness of the Armed Forces.

34. Only a policy of accessible markets supported by open competition will maintain the required level of military capability and give industry the freedom and opportunity to grow. We are committed to looking outwards and overcoming the obstacles to freer access to overseas markets. The goal is a fair and accessible competitive defence market, both at prime contractor and sub-systems levels, where this can genuinely be achieved, allowing the UK defence industry to compete on merit for leadership of and involvement in foreign programmes. We will nevertheless need to ensure that national security interests are not prejudiced in those few sensitive areas. But governments need to accept the inevitability of greater mutual interdependence and manage it advantageously. This is a significant challenge for both government and industry; notwithstanding the significant progress already made, there is much protectionist resistance to overcome.

United States

35. The Government is pressing for a freer flow of technology created on both sides of the Atlantic. The UK has signed a **Declaration of Principles** with the US which commits both governments to improve the operation of transatlantic defence business. As part of these efforts we are seeking the easier transfer of defence information not just between the two governments but at the industry level. A key aim is to conclude successfully current negotiations on a waiver from the US **International Traffic in Arms Regulations**, which would allow the export of unclassified defence items and technology to UK companies for UK and US use without a requirement for US export licences.
36. There are still major obstacles to ensuring that technology created within the US – even by the subsidiaries of UK companies – can be exploited in the UK. Even technology created here and then exported to the US becomes subject to American export controls when incorporated within a US product. While the Americans have legitimate security concerns, it is also in their interests to open up their markets to UK defence companies. Where this has been achieved, UK industry has competed well. For example, the JSF prime contractor, Lockheed Martin, has commended the economic and technological benefits for the US Government that this international competition has generated. In some other sectors (such as guided weapons), industrial rationalisation among the US giants has resulted in diminishing domestic competition. UK companies, particularly those who have a presence in the United States, could be well placed to offer existing European products to provide competitive alternatives. In order

to exploit this possibility, it will be important for European industry to focus on their project performance in these sectors.

Europe

37. We are pursuing a number of initiatives in Europe that offer potential to improve the future performance of the European defence market. In 2000 we signed the **Letter of Intent Framework Agreement** with five major European partners (France, Germany, Italy, Spain and Sweden) to facilitate the restructuring of the European defence industry. It addresses a number of key areas, including security of supply; export procedures; research and technology; and harmonisation of military requirements. We are separately promoting the liberalisation of rules governing the ownership of defence companies, and we are encouraging our allies to reduce their state shareholdings in these companies.
38. Improving the operation of the European market is not just about an integrated supply side. We are also supporting the development of a joint project management body, the **Organisation Conjoint de Cooperation en matière d'Armement** (OCCAR), together with France, Germany and Italy. Using a common framework and procurement processes through OCCAR should reduce delay in collaborative programmes, and replacing rigid workshare quotas with the more flexible concept of 'global balance' across a range of programmes will improve the effective use of competition.
39. We are also engaged in NATO and EU initiatives to improve the **harmonisation of military requirements** with our allies. Where it is feasible, agreeing capability requirements and timescales enables industry to respond to a more unified defence customer across Europe, and benefits co-operating governments in interoperability and economies of scale. Collaborative projects will stand a greater chance of success if they emerge from a single recognised capability requirement than if they are attempting to meet disparate and immutable national requirements. This is a major strand of NATO's Defence Capabilities Initiative, and European Capability Action Plan working groups, established as part of the EU's European Security and Defence Policy, may also result in the identification of joint requirements.
40. These mechanisms are securing significant advances in the way in which we do business with our allies, and there is much promise of a more integrated and open European market. However, our goals will only be achieved through sustained long-term commitment to implementing these agreements. The Government remains committed to achieving strong project performance in Europe: defence products weakened by compromise will not be competitive in the global market and thus will not provide either the sought economic benefits or the military capability required.

Exports

41. Greater market access is only one aspect of the Government's support to defence exports. Government itself benefits from this support, not least as exports can reduce unit production costs. Investment in defence programmes and technologies helps to create export opportunities for UK industry, which the Government further actively supports through the **Defence Export Services Organisation** (both directly through UK-led sales, and indirectly by contributing to export opportunities led by others). The **export credit guarantee scheme** helps UK

exporters compete effectively in overseas market where the private sector is unable to help with finance or insurance. However, the export licensing system has been an area of perceived difficulty in the past. The process has sometimes been seen by industry as bureaucratic, slow and inconsistent. The Government will continue to manage arms transfers responsibly, and there are good reasons why export licensing applications need careful scrutiny. However, we are also committed to continuous process improvement, so that export controls do not represent an unnecessary obstacle to industry undertaking legitimate business overseas.

42. In order to maintain a strong dialogue with industry and other stakeholders, we have agreed to set up a **defence export and market access forum**. This will address export promotion issues and improved access for UK industry into key foreign markets. It will be chaired by the Defence Export Services Organisation, and will bring together representatives from across industry and Government.



Eurofighter Typhoon

RESEARCH AND TECHNOLOGY

43. Military advantage is generally enjoyed by those nations with access to high technology defence solutions. Research into defence technology can influence the development of a wide range of capabilities and foster a technological base which can be exploited in the future. It also provides the crucible within which a solid UK defence industrial base can be sustained. Indeed, investment in research and technology is the critical factor in the future prosperity of the defence industry. The exploitation and commercialisation of the national science and technology base is also a major contributor to national wealth creation. Technological innovation is a key driver of productivity improvements in the economy as a whole, and is strongly supported by the Government in its business support, manufacturing, and science and innovation strategies and tax policies.
44. The present success of the defence and aerospace industries has to a large extent been

founded on investment in research and technology in past years (for example, the investment in fans and turbines in the early 1970s). The long-term health of the UK defence industry must depend on this investment being maintained. However, despite MoD investing some £2 billion a year in defence research and development (£450 million of it on research), public resources are tightly constrained and governments cannot fund research in every sub-sector. So both government and industry have to specialise, making hard choices where necessary, to channel their funding into those areas of critical military importance, helping industry to compete globally from a position of strength in key disciplines.

45. Identifying which technologies should be the focus of investment by the UK defence industry involves the difficult task of predicting which capabilities will be militarily important and commercially advantageous. We need to identify where priorities lie in terms of the value brought to the economy in sustaining particular technologies and skill sets, and which technologies hold the most potential for success in wider markets in 15-20 years' time. Certainly, the technologies which contribute most to capability development are likely to be at the high-value end of the product chain, both in systems integration and in the development of sophisticated components and sub-components. But we would wish to consult closely with industry and the Research Councils in undertaking this work. This will be achieved through a new forum, the **National Defence and Aerospace Systems Panel (NDASP)**, which will report to both MoD (via the National Defence Industries Council) and the DTI Aerospace Committee, advising on UK aerospace and defence research strategy and identifying industry's priorities for better targeting of research and technology support.
46. MoD has developed a **Technology Strategy** and a policy of research partnering with industry to help to focus and manage its research effort. Industry and academia are central to this, since the MoD itself now only has a small internal scientific research capability, the Defence Science and Technology Laboratory (Dstl). MoD is thus moving away from a single supplier of research (the former Defence Evaluation and Research Agency) and is funding research with a view to ensuring that the technology generated is made available to the industrial base. This increases the utility of that research to the equipment being acquired, and improves access to the best ideas, whether these are developed in defence manufacturers, other companies, universities or MoD laboratories. It also allows the research programme to be opened up to competition and improves value for money. MoD has undertaken a successful research competition pilot and we aspire to competing the majority of the research programme, where it makes sense to do so.
47. MoD has established two principal schemes to support the policy of partnership with industry, and to facilitate the pull-through of particular technologies into defence equipment. **Towers of Excellence** (set at system or major sub-system level) seek to improve the technological excellence of MoD and the equipment supplier base in key high priority areas. **Defence Technology Centres** are collaborative arrangements between industrial and academic experts jointly funded by the participants and MoD, to generate and exploit future technologies. Both of these schemes have been welcomed by industry and academia and are in the process of being implemented.
48. But a more focused research investment strategy is not sufficient in itself. That research needs not just to be accrued but to be pulled through into equipment solutions if it is to be of benefit to the Armed Forces. We are aligning our corporate and applied research programmes more closely to future military requirements to improve the **pull-through of technology** into

practical applications. These programmes should also enable UK industry to use that technological knowledge to bid both into ensuing MoD equipment projects and into wider defence markets.

49. We also aim to maximise exploitation of **civil technology**, where there is increasingly a high degree of technological read-across between civil and military applications, especially in the high-value communications and aerospace sectors. Historically this read-across was led by defence research (such as that into the jet engine) influencing civil applications. In recent years, this trend has reversed. The **Defence Diversification Agency**, established in 1999, plays an important role in this cross-fertilisation between the defence and civil sectors.
50. As with product development, civil technology attracts much greater private sector investment than defence, as it can be brought more quickly into a much larger marketplace and provide more rapid returns to the investor. Defence technology by contrast often involves a limited customer base, uncertain returns and long gestation periods: although research into fly-by-wire technology began in 1979, Eurofighter will be our first fighter aircraft to employ it with active control technology. MoD funding thus dominates spending on defence research and technology (being more than ten times greater than private sector investment). But it is not the only solution. There are a number of other bodies funding research which may be relevant to defence: industry, the DTI, the Research Councils and academia. By improving the strategic co-operation between MoD and these stakeholders, duplication can be avoided and resources targeted more efficiently. Taking advantage of evolving civil technology frees more public resource for those defence-specific technologies where the private sector is unable or unwilling to invest. MoD is therefore working closely with the DTI to coordinate our research funding programmes, and through NDASP we will aim to achieve a better alignment between MoD funding of the science base and that investment by industry and the Research Councils.
51. All these policy initiatives take place within the context of considerable global competition for research and development work. Companies will increasingly be enticed to migrate their technology and skills to the most favourable markets. The sustainment and exploitation of a strong national science and technology base (with its resultant economic benefits) will therefore be maximised by creating a climate in the UK which attracts technology investment, both from UK-based companies and from elsewhere. The Government seeks to set in place the right conditions within the UK to make it an attractive location to undertake research and development work. This can be demonstrated in the Chancellor's announcement in the April 2002 budget that tax relief would be extended to all companies for their research and development work, providing additional support to technology-dependent companies, and encouraging inward investment into the UK research and development base.

International research

52. Collaboration is an important means of filling gaps in the indigenous technology base. The UK, France, Germany and Sweden undertake the majority of defence research in Europe, and we must avoid duplication in this research to maximise the achievable benefits. The Research Directors of the Letter of Intent nations are actively involved in identifying areas in which government/industry research collaboration can take place on an international level, and how partner nations and their respective industries may be able to access a common pool of technology.

53. As Europe as a whole only spends a third as much on defence research as the US, we need to maintain access to US technology, not least to improve the interoperability of our forces. UK industry also needs this technology infusion if it is to prosper. We have therefore reached agreement in principle with the United States that our two countries should work together to increase substantially the proportion of transatlantic research collaboration leading to technology accessible to the industries of both countries.

Risk reduction

54. Projects involving complex systems integration or at the leading edge of technology can be inherently risky. If this risk becomes unmanageable, it can have serious implications for the companies involved and the equipment programme as a whole. Smart Acquisition calls for a greater proportion of the defence equipment budget to be spent during the earliest phases of projects, in order to reduce technical risk before the main investment decision is made. Technology demonstration in particular has real potential to reduce cost risk by means of a small focused investment to ensure that technologies are properly developed: the National Audit Office has shown that the cost/benefit ratio of demonstrators for defence programmes is 1:6.
55. The Government is committed to earlier technology de-risking in projects, and has introduced the use of frameworks such as Technology Readiness Levels, while fostering a competitive environment to stimulate continued improvement and innovation. Ensuring that new technology is made available to our equipment supplier base and embedded in defence products is a major part of this strategy. Enabling companies across the defence supply chain to have access to and exploit civil and defence technologies, not least at the component level, will also reduce risk and foster innovation. And the better alignment of research programmes through our Technology Strategy will stimulate investment in the areas of technology predicted to be of most value in defence terms.

THE FUTURE

56. The re-evaluation and development of the Government's defence industrial policy has involved extensive consultation both within Government and with industry. Dialogue and understanding between government and industry is crucial if we are to work together to achieve the best results for defence. This engagement with industry is in itself an important facet of our industrial policy, which will continue as we implement this policy. Initiatives to open foreign markets, improve technology transfer, and focus research funding can only succeed with the support of industry. Industry is already closely involved in Capability Working Groups, helping to refine and inform our future equipment capability requirements, and at a more strategic level in other joint MoD/industry working groups helping to develop and improve Smart Acquisition.
57. We will continue to monitor our progress and to maintain open dialogue with industry at all levels. It will now be important to focus on results, but we must of course keep defence industrial policy under continuous review as circumstances evolve, in full consultation with industry. At a strategic level our dialogue is conducted most notably through the **National**

Defence Industries Council and its sub-groups. But there are also a number of other high-level fora relevant to defence where Government engages with industry, including the DTI Aerospace Committee and the Shipbuilding and Marine Industries Forum. In May the Secretary of State for Trade and Industry announced the creation of the **Aerospace Innovation and Growth Team**, which comprises a wide range of stakeholders involved in civil and military aerospace. This team will produce a shared vision of the direction of the aerospace industry over the next ten to twenty years, and it will be able to build on this defence industrial policy framework which has been developed in consultation with the industry.

58. The strategic environment will continue to change, and our military priorities will develop likewise. Exploitation of the potential of **networked capability**, using information superiority linked to precision attack systems to achieve a rapid response to often fleeting opportunities, poses new challenges both to Smart Acquisition and to our industrial policy. It presumes a further shift of emphasis away from platform-based acquisition, and towards the development of sub-systems independently from their host platforms. This will require a high degree of cross-project working, and co-operation among defence suppliers which also compete at the platform and component level. It will also amplify the need for international co-operation at defence industry level, in order to make best use of scarce skilled resources and finite communications capacity, and to meet the need to network with coalition partners.

59. In an open market, the trend will be for investment and economic benefit to migrate towards markets providing the best returns. This includes a favourable commercial and regulatory climate, a fair and sensibly applied competitive process, and getting the risk/reward balance correct through the early technological de-risking of projects. Companies also need to be able to formulate their future investment strategies confidently, which requires a better understanding of what the Government requires in the long term. A clear industrial policy framework – as set out in this document – should help. But it is the sum of acquisition activity within this framework that will give more tangible substance to our industrial policy. If this activity enables the Armed Forces to be provided with the highest quality equipment and support for the resources available, while encouraging a highly-skilled and competitive industry in the UK, bringing value to the national economy and to its science and technology base, then the policy will have achieved its objectives.

Ministry of Defence
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