



Defence Skills A Shift in the Myth

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The relationship between a government and the defence and security businesses that operate from within its national borders is complicated.¹ It is marked by competing and complementary understandings and explanations, which seem to continually re-emerge in the discourses of defence, peppering policy-making in this area.²

At one extreme is the image of a 'defence-industrial complex'; a privileged, politically powerful and complacent industrial sector, requiring and obtaining the constant nourishment of government money. Yet the number of firms that have opted to leave the defence sector, and government readiness to reduce the defence share of GDP, both suggest that the political reach of defence businesses might not be as great as some think. In contrast, politicians, analysts and the military, for instance, may describe defence industry as being important as a capability partner to the armed forces in theatre, on the front line – directly supporting war-fighting troops.³

Other understandings may favour the notion of the defence-industrial base as a national hub of knowledge, equipment and support, able to surge

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1. Henrik Heidenkamp, John Louth and Trevor Taylor, *The Defence Industrial Triptych: Government as Customer, Sponsor and Regulator* (London: RUSI, 2013).
 2. See Neil Latham, 'Defence Industry in a Global Context: Policy Implications for the United Kingdom', *RUSI Whitehall Paper 57* (2003) and Jacques S Gansler, *Democracy's Arsenal: Creating a Twenty-First-Century Defense Industry* (Cambridge, MA: MIT Press, 2011).
 3. Henrik Heidenkamp, 'Sustaining the UK's Defence Effort: Contractor Support to Operations Market Dynamics', *RUSI Whitehall Report 2-12* (April 2012).

outputs at moments of acute national crises.⁴ Or, more simply, businesses supplying the armed forces ‘merely’ design, manufacture, deliver, upgrade, maintain and dispose of the physical equipment that the soldier, airman and sailor use in their operations and training.

Common to these latter perspectives, perhaps, is the sense that the skills and competencies of the defence-industrial worker are important to standing ideas around national security and international obligations; that *critical skills* relating to defence capability actually reside with the folk in overalls on the factory floor as well as with those in military uniforms.⁵

That is not to say, for example, that aircraft engineering skills are unique to defence, as in many cases they are not. An aircraft engineer working on Typhoon at Warton for BAE Systems possesses similar competencies to the civil engineer working for Airbus in Bristol. But the skills of the latter cannot be harnessed to the needs of defence, in the short-term at least, as they are embedded within the civilian economy. Of course, a future transition from a peacetime to a wartime economy as experienced in the Second World War would change this calculation, but we are assuming, for now, that scenarios of total war do not form a significant part of the UK’s military planning assumptions.

Rather, a curious element of the common understandings of defence competencies is an assumption that the skills in a given defence-industrial base somehow self-regulate through the hidden hand of the market. This means that, when one company within the defence ecosystem makes redundancies – for example, to relieve perceived over-capacity – another defence business will absorb these skills.⁶ As a consequence, in Britain we take comfort, perhaps erroneously, in the narrative that defence-industrial competencies remain alive and available to state decision-makers – essentially frozen into some form of perpetual equilibrium of assured supply. As the British government stated in 2005:⁷

A greater proportion of our overall [defence and security] business is available to industry than in any other major defence nation [delivered through] a highly skilled and flexible labour force.

4. Adam Tooze, *The Wages of Destruction: The Making and Breaking of the Nazi Economy* (London: Penguin, 2008).

5. John Louth, ‘The Defence Industrial Knowledge Base: The Core Capability?’, *RUSI Defence Systems* (Vol. 15, No. 1, August 2012), pp. 42–43.

6. This point was made by a retired defence minister at an interview with one of the authors in London on 6 February 2013.

7. HM Government, *The Defence Industrial Strategy*, Cm 6697 (London: The Stationery Office, 2005), para A4.22.

Research Purpose

This briefing is concerned with defence skills, competencies and capacity. It explores what happens to the wider economy and to defence competencies when people leave defence businesses – either voluntarily or as part of a deliberate redundancy scheme. The paper also tests the premise that the defence market self-regulates in the maintenance of a country's defence skills base.

In doing so, the authors describe the approach and research methods adopted and offer their views on the constraints of the methodology. The intention is to be scrupulously clear and open in relation to both the research pool and findings. If anything, the authors could be accused of being a little too cautious and restrained in the extrapolation of the findings into a wider defence economic analysis. A judgement on this is left to the reader.

Methods and Methodology

The authors approached the UK's largest defence contractor and original equipment manufacturer (OEM) of defence goods, BAE Systems, and requested access to former employees who had left the business over the period under examination, namely the five years from 2007 to 2011. The choice of BAE Systems reflects a belief that its range of defence services and equipment offerings across land, sea and air domains would make this business a suitable fractal or representative of the broader defence-industrial ecosystem.

The contribution of BAE Systems to the UK economy can be summarised as follows:⁸

- In 2009, the business's direct value-added contribution to UK GDP was in the region of £3.3 billion
- Productivity, as measured by value added per employee or their full-time equivalent, was £78,175, compared to the UK economic average of £42,200. This represents an 85 per cent uplift on the average in favour of the defence business
- The UK business generated net exports of £4.8 billion
- The business contributed £653 million in direct taxation to the Exchequer
- Company research and development expenditure amounted to £900 million
- The business sourced supplies and components from other UK businesses to the value of £4.1 billion

8. See Oxford Economics, 'The Economic Contribution of BAE Systems to the UK in 2009', April 2011. The authors also discuss this in Henrik Heidenkamp, John Louth and Trevor Taylor, 'The Defence Industrial Ecosystem: Delivering Security in an Uncertain World', RUSI Whitehall Report 2-11 (June 2011).

- Within its supply chain, the company supported 125,000 jobs in the UK economy alone.

Moreover, the business is the UK's largest single employer of engineers and engineering project staff – an indication of the substantial knowledge and intellectual capital residing in the UK defence-industrial base. What happens to the people possessed of these skills and competencies once they leave the company (for whatever reason) seems a matter of sensible inquiry for anybody interested in defence. As the authors argue in a previous report:⁹

BAE Systems could be characterised as having a significant and quantifiable impact upon the society and economy in which it is headquartered as well as, on a more assumptive basis, a major impact upon the individuals it employs (both directly and indirectly) and, by extension, the individuals it serves at both policy-making and war-fighting levels.

Working with BAE Systems, the authors identified a research pool of 2,500 ex-employees who were each sent a questionnaire seeking to capture information relating to the moment they left the business and their subsequent activities. A number of informal, semi-structured telephone interviews were also conducted where respondents had indicated that they wished for a follow-up call to be made. Of the number of questionnaires sent out, the research team received 586 responses in reply, representing a return of 23.4 per cent. The methodological literature suggests that this is a credible and relevant research return.¹⁰

The analysis, consequently, is based on this single research pool, drawn from one business at one particular moment in defence – a particularly difficult moment, as discussed shortly. The findings, therefore, need to be viewed in this context. They do not present the definitive story of the defence skills-base in the UK, but an understanding of what is going on is suggested by the experiences of BAE Systems employees during this period. This, of itself, makes the findings relevant as the UK approaches the next general election and Strategic Defence and Security Review, both due in 2015.

The Research Period

The period spanned by the study – 2007 to 2011 – was an especially challenging one for UK defence from three distinct perspectives. First, the UK's publication of its National Security Strategy and the Strategic Defence

9. Heidenkamp, Louth and Taylor, 'The Defence Industrial Ecosystem', p. 8.

10. See, for example, Mark Saunders, Philip Lewis and Adrian Thornhill, *Research Methods for Business Students* (Harlow: Pearson Education, 2000).

and Security Review (SDSR)¹¹ in 2010 confirmed that the defence budget had to contract by about 7.5 per cent to 2015, and that military capabilities would need to be reduced and rationalised. This led to platforms such as the Harrier and Nimrod MRA4 being removed immediately from the UK inventory. In 2011, the House of Commons Defence Select Committee heavily criticised government policy on defence, claiming that UK forces would, in future, struggle to meet commitments in Afghanistan and elsewhere. Moreover, the Committee asserted that capability gaps would emerge in the short to medium term, in terms of carrier-strike and maritime patrol capabilities for example, and that in the medium to long term the UK would no longer be capable of full-spectrum operations.¹² The chairman of the Defence Select Committee, James Arbuthnot MP, went so far as to say that the SDSR¹³

...is a clear example of the need for savings overriding the strategic security of the UK and the capability needs of the Armed Forces. The Government needs to outline its plans to manage the gap left by the loss of these capabilities.

Second, a number of National Audit Office reports argued that substantial systemic and behavioural issues around the management of UK defence equipment, relationships and personnel bequeathed a cycle of unrealistic requirement-setting, planning and competition policies, and budgeting and contractual practices.¹⁴ By 2010, this had led to substantial cost overruns, delays to equipment in-service dates, and the necessity for the Ministry of Defence (MoD) to find significant short-term budgetary savings. Overlap the policy of austerity onto this organisational and financial dysfunction, and the UK had a sizeable hole in its defence budget. This was comprised of an 'unfunded liability' of £38 billion recorded in the SDSR; £8 billion to review and renew the nuclear deterrent in some form; and a £5.5 billion revaluation of the core equipment programme ordered by Bernard Gray, the Chief of Defence Materiel – all this adding up to a ten-year funding gap

11. HM Government, *Securing Britain in an Age of Austerity: The Strategic Defence and Security Review*, Cm 7948 (London: The Stationery Office, October 2010).

12. House of Commons Defence Committee, 'MPs Publish Report on Strategic Defence and Security Review and the National Security Strategy', Select Committee Announcement, 3 August 2011, <<http://www.parliament.uk/business/committees/committees-a-z/commons-select/defence-committee/news/strategic-defence-and-security-review-and-national-security-strategy-report/>>, accessed 6 June 2014.

13. *Ibid.*

14. See, for example, National Audit Office, *Ministry of Defence Major Projects Report 2007*, HC 98-1 (London: The Stationery Office, November 2007).

of £51 billion from 2010/11 to 2020/21.¹⁵ The uncertainties associated with budgetary constraints, the need for economies, changing requirements, an operational drawdown from Afghanistan by 2015, and the potential restructuring of the military itself¹⁶ meant that the UK presented a volatile and complex place in which to make sense of the business of defence.

Third, despite a long history of indigenous defence-industrial capabilities, there was a growing unease in relation to defence-industrial policy under the Conservative–Liberal Democrat coalition government. It is government policy to have a complete range of defence capabilities to meet seven key strategic tasks¹⁷ – ranging from the defence of the UK and overseas sovereign territories; through the ability to project power via expeditionary interventions; to the provision of support to the civil authority in response to natural and manmade emergencies. Likewise, it is government’s responsibility to align resources with required capabilities in order to meet these goals. If the resources are not there, or if savings are required in pursuit of other considered government policies, then the defence capability demanded has to be reduced. During the research period in question, it seemed a legitimate concern that successive governments failed to understand the causal, linear relationship between capability demanded and resources needed.

As a consequence of these three factors, the management of BAE Systems took a number of decisions to rationalise the footprint and size of the business in the UK; for example, closing sites at Brough and Chadderton, and announcing the ending of shipbuilding for the Royal Navy at Portsmouth. Naturally, this particular moment in defence has driven the data responses and findings.

Employee Responses

Of the respondent panel tested, over a third of employees left BAE Systems in the final year of the sample, with the proportion of exiting personnel broken down as follows:

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15. This estimate is based on the assumption that the defence budget under a Labour Government from 2010 would have remained level in real terms, compared with the forecast budget needed to finance MoD known forward plans from 2010 to 2020/21. See Malcolm Chalmers, ‘Capability Cost Trends: Implications for the Defence Review’, Future Defence Review Working Paper No. 5, RUSI, January 2010.
 16. For a summary of the Levene reforms, see Mike Dunn et al., ‘The Defence Reform Agenda’, RUSI Briefing Paper, June 2011.
 17. There are seven military tasks assigned to the Ministry of Defence by the UK government: providing strategic intelligence; providing nuclear deterrence; defending the UK and its overseas territories; supporting civil emergency operations as part of crisis management; providing a defence contribution to UK influence; defending the national interest by projecting power strategically and through expeditionary intervention; and providing security through stabilisation. The first four tasks are strategic and compulsory.

Table 1: Year of Exit from BAE Systems.

Year	%
2007	16
2008	21
2009	9
2010	18
2011	36

This bias towards 2011 reflects the restructuring of the business undertaken that year in response to the SDSR when, for example, the Nimrod MRA4 programme was cancelled by the government, as discussed above. Indeed, when the sample period is reviewed as a whole, 54 per cent of personnel left the business on redundancy terms, with over 50 per cent of this figure itself being of a compulsory nature. Only 20 per cent of the sample employees left for another job over the same period, which hints at a stable and committed defence workforce as well as, perhaps, an economy in trouble. Table 2 shows the terms on which employees left BAE Systems over the research period.

Table 2: Terms of Exit from BAE Systems.

Terms of Exit	%
Compulsory Redundancy	19
Voluntary Redundancy	35
Early Retirement	17
Found Other Job	19
Other	10

Irrespective of the manner or type of exit during this period, over half of those personnel leaving the business sought comparable work with another company in the defence sector, as Table 3 reveals. This suggests that there is significant preference to remain within the defence workforce, an idea reinforced during semi-structured interviews.

Table 3: Work Sought by Personnel Exiting BAE Systems.

Type of Work	%
Seeking Comparable Work with Defence Business	51
Not Seeking Comparable Work with a Defence Business	49

Respondents stated that, in terms of finding new work following their time with BAE Systems, lead times were extremely varied, whether the new role was sought within or beyond the defence sector. Only 2 per cent found work immediately, whilst 34 per cent found their role within three months of leaving

BAE Systems. Significantly, 50 per cent took at least six months to secure a new job, with 7 per cent taking more than twelve months to find work.

Table 4: Time Taken by Personnel Exiting BAE Systems to Find New Work.

Time Taken to Find Work	%
Immediately	2
Within 1 month	15
1–3 months	17
3–6 months	31
6–12 months	11
Over 12 months	7
Still seeking work	1
Not applicable	16

The core specialisms on exit are captured in Table 5 and range from programme director through to manual support. A quarter of those leaving the business worked as engineers in either the construction or fitting sub-specialisms. Ten per cent of workers left from project management, whilst another 10 per cent were to be found working in information technology on exit. Interestingly, given the government's commitment to scientific and engineering topics, 3 per cent were employed as scientists when they left the business.

Table 5: Principal Specialism on Exit from BAE Systems.

Specialism	%
Corporate Executive/Director	-
Programme/Project Director	1
Engineer – Chartered	2
Scientist	3
Research and Development	-
Production Manager	3
Project Management	10
Engineer – Construction/Fitting	25
Information Technology	10
Supply Chain/Logistics	2
Support – Technical	6
Support – Manual	9
Business Development/Sales/Marketing	7
HR	5
Training	4
Finance	10
Design	-
Other – Health and Safety Executive	3

Of these specialist clusters, exiting personnel were found to have been employed predominantly in manufacturing areas of the business (42 per cent) or in maintenance roles, with 17 per cent offering maintenance support to others within the business. Roles across project support to the external customer – the MoD and the armed forces – accounted for 14 per cent of those personnel leaving the business. Table 6 shows the breakdown of those leaving the business by functional area.

Table 6: Business Area on Exit from BAE Systems.

Functional Area	%
Research/Applied Research	2
Business Development	6
Engineering	4
Manufacturing	42
Maintenance	17
Project Support to Customer	14
Service Support to BAE Systems	10
Corporate Leadership/Management	1
Other	4

Table 7 presents the new roles secured by personnel following their exit from BAE Systems. Of significance, perhaps, despite a widespread commitment to defence, only one in five employees found roles in a defence business. A similar proportion was able to secure work in aerospace, hinting at the synergies between aerospace and defence, whilst a third of personnel found work in the commercial, charitable or public sectors. A tenth of all exiting personnel re-entered education or training. These data are discussed further in the next section, but it is significant that, despite more than half of the personnel seeking comparable work in the defence sector on exit, only nineteen per cent were successful – a phenomenon described later as ‘skills leakage from defence’.

Table 7: Summary of New Roles Secured Following Exit from BAE Systems.

Role Obtained	%
Defence Sector	19
Aerospace Sector	21
Commercial Sector (other than Defence and Aerospace)	14
Public Sector	8
Charitable or Voluntary Sector	10
Retired	17
Still Seeking Work	1
Retraining or Personal Education	10

In terms of the specific roles obtained by employees exiting the defence business in comparison to their previous defence roles, the new positions are described in Table 8.

Table 8: New Role when Compared to Previous Defence Role with BAE Systems.

Level of New in relation to Old Defence Role	%
Comparable	38
An Advancement	16
A Demotion	28
Not Applicable	9
Not Answered	9

Consequently, more than a quarter of personnel perceived their new role to be a demotion, whilst 38 per cent thought their new roles to be comparable to their former BAE Systems roles. Sixteen per cent considered the new role to be a promotion. Moreover, the percentage of the skills and competencies associated with the erstwhile defence role and used in the new position was characterised as follows:

Table 9: Proportion of Defence Skills Utilised in New Role.

Defence Skills Utilised	%
Up to 25% of BAE Systems role	17
25–50% of BAE Systems role	51
Over 50% of BAE Systems role	9
The Same	17
Not Answered	6

The data also demonstrate that, based on the defence business salary on exit, the new role of former BAE Systems employees was typically lower-paid (see Table 10). Indeed, only 17 per cent of those leaving the business were paid better as a result, with the overwhelming majority paid the same or less. The economic implications of this are discussed in the findings.

Table 10: Comparison of Salary in New Role compared to Role with BAE Systems.

Salary in New Role	%
Better paid	17
Paid the same	17
25% lower-paid	20
25-50% lower-paid	18
Over 50% lower-paid	2
Not Applicable	18
Not Answered	8

The need to relocate, on securing a new role, is presented in Table 11. This indicates that a third of respondents relocated for work.

Table 11: Proportion of Personnel Relocating for Work on Exiting BAE Systems.

Need for Relocation	%
Yes	34
No	53
Not applicable	13

The employee's age on exiting the defence business is captured in Table 12, revealing that close to 60 per cent of those leaving were aged over forty, with the under-30s accounting for only 11 per cent.

Table 12: Age of Personnel on Exit from BAE Systems.

Age	%
Over 60 years old	9
50–60 years old	25
40–50 years old	25
30–40 years old	23
Under 30	11
Not Answered	7

Research Findings

The findings are significant for policy-makers, irrespective of whether their focus is on the economy or defence. Based on the assumption that this review of BAE Systems and the employee sample in question are representative of the broader defence market in the UK, this suggests the following.

Skills Leakage

The basic premise presented at the beginning of the paper was that skills within the defence-industrial base self-regulated through market forces, so that when one defence company within the UK restructures, or in another way makes headcount reductions, another defence business would absorb these skills. In this way, they were viewed not to be lost to the UK's 'order of battle' or to its broader defence capabilities.¹⁸

This has proven not to be the case. When workers have exited the defence ecosystem, between 2007 and 2011, over half of those surveyed did so on either compulsory or voluntary redundancy terms. A similar proportion sought comparable work with another defence business, but only 20 per cent managed to find such an appointment, with a similar number finding work

18. See Gansler, *Democracy's Arsenal*

within the civil aerospace sector. It can be asserted, therefore, that based on this data, 80 per cent of the personnel leaving a defence business are lost to the sector as a whole – their skills are not reabsorbed by another defence business. Moreover, 45 per cent of these exiting personnel are engineers, project managers and information technology specialists – in possession of core skills deemed essential to the defence economy.¹⁹

The case can be made, therefore, that without government sponsorship and intervention, defence skills do wither when left to the free market. This has to be taken into account when defence and security strategies and policies are developed. That is not to say that the rationalisation and contraction of the UK defence-industrial base should not take place – though the authors are not sure it is wise to deliberately reduce indigenous-defence capabilities – but government should be aware of the impact of such policies on national skills and competencies.

The Impact on Tax Revenues

Building on previous work on the tax revenues directly associated with defence contracts,²⁰ the data above indicate that the government will have experienced both a short-term and a longer-term drop in revenues as a result of the redundancies made in the defence sector. The short-term drop relates to the periods in which people were out of work and thus not paying tax (they could also have been claiming job-seekers allowance). The longer-term revenue falls relate to the number of people taking early retirement (17 per cent), and those moving to jobs where they were less well-paid (at least 40 per cent).

Regional Impacts

Significantly, just over a third of those leaving the defence company relocated in order to find other work. For areas in which the defence industry is important on a regional scale – such as Barrow, Preston, Blackburn and Portsmouth – this suggests that defence cuts will potentially have a regional impact in terms of local authority revenues, housing prices and the returns to consumer-facing business, as skilled people on good pay grades leave the local area. Indeed, a number of the semi-structured interviews suggested that having to leave the local area to secure new employment was both socially traumatic and economically impactful.

Economic Perceptions

The high proportion of former defence employees who were able to find work within twelve months suggests that there is little perception in the wider economy that defence industry personnel, accustomed to an operating environment where the government is the main customer and activities are

19. See, for example, the collection of papers in David Moore (ed.), *Case Studies in Defence Procurement and Logistics: Volume 1 – From World War II to the Post Cold-War World* (Cambridge: Cambridge Academic, 2011).

20. See Trevor Taylor and John Louth, 'The Destinations of the Defence Pound', RUSI Briefing Paper, January 2012.

regulated, are not suitable for employment in the competitive world of the civilian economy. However, the authors built on the information generated above to focus particularly on the directions followed by those with scientific, technical, engineering and mathematics (STEM) backgrounds. The government is keen to emphasise the UK's position as a high-technology economy in which STEM skills need to be further developed. From the data, it has not been possible to calculate the proportion of the 46 per cent of personnel leaving defence with a STEM background (Table 5) who took jobs beyond the defence, aerospace or the broader commercial sectors. However, no less than 68 per cent of personnel (Table 9) said that, in their new roles, they were not using the skills and competencies that they applied in defence. Further investigation would be needed to confirm that many former defence sector employees with technical backgrounds are experiencing a lack of demand for their specific skills in both the civilian and defence sectors, although the indications from the data here are clear: as recently as 2011, the British economy was still not working to generate a strong demand for those with high-value technical competencies and expertise.

Conclusions

Most significantly, when a defence business makes headcount reductions, defence skills and competencies are not redistributed between similar businesses by the free market. Rather, 80 per cent of personnel – and their core competencies – are lost to the defence sector. This is significant, as about half of the personnel leaving defence possess scientific, technological, engineering or mathematics backgrounds – subjects essential to a healthy defence sector and broader economy.

Moreover, this paper suggests that Treasury models addressing the impact of cutting the defence budget should take into account likely redundancies from industry and the decrease in government revenues that would result. Defence savings, to a significant extent, affect government income (as well as reducing expenditure) and can have the effect of transferring state spending on an individual from a bounded and controlled defence contract offering specific defence benefits to, in the short-term, demand-led social-security payments with little national benefit other than the subsistence of the individual. If the government really wanted to ensure economic and fiscal gain by cutting defence expenditure, it should make a particular effort when the economy is flourishing, as opposed to when it is struggling or beginning to recover from recession.

It seems clear that redundancies within the defence sector have a particular regional impact, with a third of personnel having to relocate to secure new employment. Defence cuts that affect specific regions should be identified in advance by government and be accompanied by national and European initiatives to boost high-technology investment in those regions. In this way, the risks associated with a significant exodus of well-paid personnel, a fall in house

values, and so on, can be mitigated and managed, leaving the region in question less exposed to economic uncertainty than would otherwise be the case.

Lastly, when imposing cuts on the on-shore defence industry, the government must recognise their impact on defence capability and the UK's capacity to develop, produce and support equipment and services – and thus to enjoy the operational sovereignty that comes with not needing to rely on external suppliers. Half of the people leaving defence did not seek another job in the defence sector: this should sound a warning to policy-makers and defence planners who value the UK's ability to respond to geopolitical threats, risks and uncertainties.

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