



RUSI ACQUISITION FOCUS

The RUSI Acquisition Focus was formed in March 2006 to provide expert, objective views on aspects of defence equipment acquisition. The Focus, meeting only three times a year, cannot claim to provide detailed solutions to the issues discussed but, as a widely experienced group, it does pinpoint the essential arguments for a way forward. This, its fifth paper, discusses the 'Conspiracy of Optimism' that appears to exist between MoD and industry and which is responsible for a major proportion of the time and cost overruns in the procurement phases of a programme. The paper suggests ways in which the 'conspiracy' might be eliminated.

The Conspiracy of Optimism

The members of the RUSI Acquisition Focus are: John Weston (Chairman iSOFT), Tim Banfield (NAO), Bob Barton (co-chair of the MoD/Industry Equipment Capability Group), Vice Admiral (retired) Jeremy Blackham (recently EADS UK President), John Dowdy (Director, McKinsey), Professor Christopher Elliott (GD UK), Graham Jordan (formerly S&T Director, MoD), Gerry Paulus (Managing Director, SVGC Ltd), Major General (retired) Bill Robins (formerly DGICS, MoD), Professor Trevor Taylor (Head of Defence Management and Security Analysis, Cranfield University), Bill Kincaid (Editor RUSI Defence Systems)

Delays and cost overruns to defence programmes have many causes. One cause, however, does not seem to have been much debated although it is universally recognised – the 'conspiracy of optimism'. The term has been in use since at least the mid-1990s and its existence may date back further.

General Rob Fulton, when he was DCDS(EC) saw it as a bipartite behavioural problem, with MoD and industry as co-conspirators. Essentially, both sides had a propensity to strike unrealistic agreements, later recognising, but not necessarily admitting, that the basis on which contracts had been let was highly optimistic. In many cases both parties knew very well at the time that the offer made was unrealistic in terms of either cost, timescale or delivered performance. Neither side would acknowledge that it was actively part of a conspiracy, but the behaviours clearly exhibited all the same characteristics. The result is that the contracted cost and schedule are almost always far too low, thereby causing apparent cost growth and schedule overruns as the programme proceeds, when in reality these were inevitable outcomes of the bidding process.

Agreeing to unrealistic programme parameters is a fact (much reported by successive NAO Major Project Reports), but what has sustained the practice and why does the 'system' encourage such behaviour?

SUMMARY

A 'conspiracy of optimism' exists between MoD and industry, each having a propensity, in many cases knowingly, to strike agreements that are so optimistic as to be unsustainable in terms of cost, timescale or performance.

The causes are several. Optimistic defence assumptions based on policy dogma, Service aspirations, and Government reluctance to fully fund commitments lead to an overheated defence programme. To get new projects funded is therefore difficult, leading to 'entryism' when the initial cost and schedule are deliberately under-estimated. This is compounded by poor cost-estimation techniques, which frequently omit costs for development and testing of interfaces, technology demonstration and industrialisation, training and/or manpower. Technology risks are too often under-estimated.

Because of the decline in the number and frequency of contracts for large, intellectually rich development

programmes, industry sees many of these as 'must win' and, in step with optimistic MoD budgeting, bids an optimistic price on an optimistic schedule, expecting to claw back some of the shortfall during subsequent phases. Often both sides know that the basis of the contract is unrealistic.

Projects are seldom cancelled once they are fully launched, and the lack of transparency shelters those who make poor decisions.

If the 'conspiracy of optimism' is to be eliminated, MoD and industry must ensure that: defence planning assumptions and equipment aspirations are realistic; independent cost estimates are produced; transparency is improved; programmes with large cost overruns and delay are considered for cancellation; interfaces and technology risks are properly identified and managed; large complex programmes are managed with greater initiative and less process constraint; and all this is carried through into acquisition education and training.

The Causes

Aspirations

During the Cold War, quality of defence equipment was paramount: we needed equipment that was as good as, or better than, Soviet equipment. Timeliness was less important. This was the mindset in which

most of today's top military and industrial leaders learned their job.

Since the end of Communism, we aspire to equip our forces with the best, which in effect means US quality, in a world of much faster technological change; time therefore does matter. The aspiration to keep up with the US at the tactical and operational level,

if not the strategic level, places a huge strain on our much reduced defence budget, yet the war on terror has dissimilar demands, not least a rather different balance between quality and numbers.

'Neither side would acknowledge that it was actively part of a conspiracy, but the behaviours clearly exhibited all the same characteristics'

The UK policy to 'punch above its weight' without the resources to do so places a premium both on the quantity of key equipments (to replace battle casualties, e.g. Chinook and Warrior) and on the quality and level of sophistication (in the case of CIS to handle coalition interoperability, particularly with the US). With our limited spend and, particularly, our drastic reduction in R&T funding, we are now in danger of falling between the two stools of quantity and quality.

The defence planning assumptions (DPAs) begin as a rigorous analysis of what threats face the country and what defence capability is required to meet them. Unfortunately, that rigour breaks down when confronted by real-world issues of affordability and selective trade-offs are made between different DPAs. This happens because the DPAs are assumptions, not facts and are, as such, open to interpretation and debate. Finally, real-world events unfold more quickly than MoD seems able to change DPAs – they are, after all, a snapshot frozen in time – and they very soon become dated. All this means that the DPAs give a veneer of scientific support to decisions that are rather more determined by cost and political judgement; the DPAs are used in these arguments with false precision in order to substantiate important procurement decisions made elsewhere. The result is that we plan for defence capability that proves inadequate for the task when it arrives and which is then expensively expanded at short notice,

playing havoc with the financial cohesion of the long-term equipment programme. As evidence, our present commitment to two continuing operations overseas has breached the DPAs that created the military capability to fight them. Since 2002, the scenarios on which DPAs are based may not have changed, but equipment numbers have been repeatedly reduced and commitment levels have continuously exceeded planning assumptions, undermining the logic of scenarios and assumptions.

Another contribution to the overheated equipment programme is the desire to develop equipment from scratch in the UK. This is at the heart of the Defence Industrial Strategy (DIS) and UK jobs, IPR ownership and European solidarity often override the economic and schedule advantages of buying off-the-shelf. The balance of arguments for buying C-17 off-the-shelf against the European development of A400M illustrates this issue.

Entryism

This optimism in the DPAs, the desire to punch above our weight with the reluctance to pay for it, and the bias against buying off-the-shelf all create an overheated equipment programme. Overheating is also fuelled by deliberate over-programming to avoid underspend, inaccurate costing of non-equipment defence lines of development, and Service aspirations to maintain size and shape. Overheating is not a transient problem, but is with us to stay unless substantially different practices are adopted. An overheated programme is 'unaffordable', but for the MoD this may

seem preferable to accepting cuts early. It may also act as a weapon in the continuing battle with the Treasury for increased funds – in many cases to match the increasing (and underfunded) commitments of the Government. It also means that existing programmes can be kept alive, albeit artificially, but reduced in scale or capability or further delayed, despite the high risk of technological obsolescence this brings.

Getting new projects into an overheated equipment programme, or seeking increased funding for existing projects, is difficult as it requires the deletion, delay or reduction of another project or projects – the larger the sum of money, the more difficult it is to get it into the equipment plan, particularly if the programme is to meet an emerging requirement with funding required in the immediate future. Consequently, there is positive pressure to reduce the estimate of the cost to, or beyond, the minimum.

Examples are legion. For example, the original British Aerospace (BAe) estimate for the cost of the Nimrod MRA4 programme was around £2.9Bn. Squeezed through several 'best and final' offer rounds it was eventually contracted at around £1.8Bn. The final outcome is expected to be over £3.5Bn. Again, the Tornado mid-life update was originally estimated at around £800M. The scope was reduced to get the costs down to around £400M to get it into the equipment programme, with both MoD and BAE Systems recognising that additional work, not included in the reduced scope, would have to be funded separately to produce an effective system.

Aircraft Carriers – a potted history...

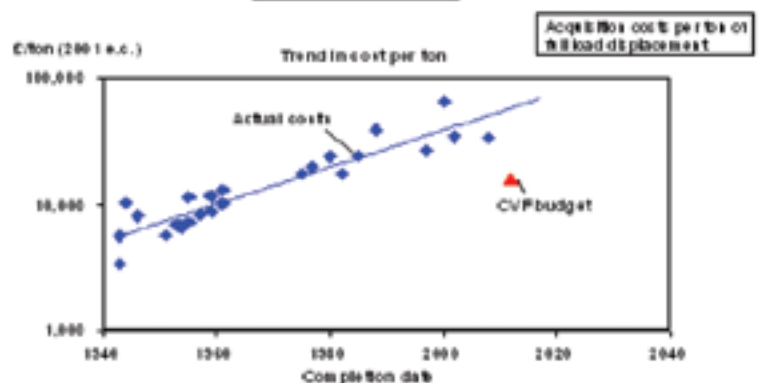


Figure 1: CVF and historical costs [HVR]



Once this was added back, the programme came in close to the original estimate. The post-project analysis conveniently forgets that the outturn was pretty close to the original 'unacceptable' estimate.

Poor Cost Estimation

Estimating costs, including support over perhaps a 40-year period, at the start of a complex development programme is difficult. In the past, estimated costs have often left out essentials such as development of interfaces with other programmes, interface testing, technology demonstration and industrialisation, training and manpower costs. An obvious example is the exclusion of dockyard construction costs at Devonport when considering certain nuclear submarine issues. This exclusion of certain costs is nothing new, but the withdrawal of MoD from active participation in design and the reliance on competition over the last quarter of a century has degraded MoD's ability to understand costs and to estimate them with any accuracy.

The problem here is that more accurate cost estimation will normally arrive at a much higher figure than is budgeted, and 'creative accounting' may be used just to get the project into the equipment programme. A good example (see Figure 1) is the future aircraft carrier programme (CVF) where MoD 'estimated' the cost as about £2.9Bn, whereas non-MoD estimators set it at £3.9Bn or more (and this figure was a multi-source view).

The latter figure is now in the programme. But would another programme with less political sensitivity and weaker Service pronency have stayed in the programme without major surgery or delay to the In-Service Date (ISD)?

Programme Management

The MoD acquisition cycle tends to treat all projects (except UORs and Special Projects) in the same way. However, small projects or buys off-the-shelf are totally different from large programmes with a major development element, and the failure to treat non-repetitive, intellectually-rich procurement differently from that of smaller, less complex projects (which generally come in on estimate and largely on time) is at the heart of the problem.

The NAO Major Project Reports

have repeatedly shown failings in the management of large, complex programmes; these, almost without exception, are the 'problem children' (some have called them 'wicked programmes').

Managing such programmes requires totally different skills to ensure that effective problem exploration, option generation and analysis are undertaken before decisions are made on solutions. PERT Management here will fail: what is needed is joint, goal-directed management with trades being a fundamental part of the progression.

'Technology demonstration is essential, but can only be done if enough time and funding are available in the early project stages'

Industry's 'Must Win' Approach

Large programmes, delivering major improvements to capability, are let infrequently and have inherently long cycle times. Consequently, each new major programme suffers from a 'collective loss of memory' – either because the industrial capability has decayed or has been lost through natural wastage of the original deliverers. Industry, faced with such infrequent specialist acquisitions, sees a stark reality of 'existence or bust' relating to win/lose and with it the secondary effect of loss of capability that is needed to sustain the existing equipment and services. A 'must win' mentality is created and this is a primary breeder of optimism, which is often reinforced by dubious competitive practices.

In step with the MoD's minimum costings, defence companies will bid a minimum price in order to win a competition that they feel is a 'must win'. Once the competition is won, there is pressure to recover costs through whatever mechanisms exist in the contract so as to increase (or in many cases restore) the tiny profit margin in the bid price.

Prior to DIS, there was little recognition that this drive to recover costs after

unrealistic bids and fixed-price contracting existed, and even now it appears that the Treasury either cannot recognise it or will not accept it.

Technology Risk

One of the major causes of delay and cost increase is the failure to drive out technology risk early enough in the procurement cycle. Too often the necessary funds are not included in the original cost estimates, as mentioned above, and early commitment is inevitably made against optimistic cost forecasts. Technology demonstration is essential, but can only be done if enough time and funding are available in the early project stages. There appears to be a lack of understanding in MoD, and a reluctant acceptance on the part of industry, of the paucity of funding for this.

Many years ago, it was MoD policy to pay for development, the de-risking of technology and the development of prototypes, even pre-production models. Some highly successful programmes, with a joint and well-developed estimating process, came through this system and, in our view, delivered better Value-for-Money (VfM) than more recent programmes. The process was based on gradually increasing certainty, not expecting it at the outset. An excellent example is Rapier Field Standard C. Wherever there are unknown technology, manufacturing, integration and performance risks the now familiar 'first-of-class direct build' approach (effectively a prototype taken directly into service) will inevitably meet optimistic schedules head on, and there seems to be little recognition of this in the timescale available – the huge delays in the early stages of the acquisition process of Bowman and FRES contribute hugely to compressed timescales in the Demonstration and Manufacture stages. Moreover, first-of-class build compounds the problems because, in the absence, in many areas, of any controlled environment in which to de-bug prior to further build, any problems get compounded into the second and subsequent builds, so multiplying delays and cost escalation.

The desire for premature certainty is exemplified by the practice of fixed-price contracting; the expectation of accuracy is quite unrealistic in the early stages of a programme when the risks cannot be

clearly defined. This fixed-price obsession is a significant reason for *apparent* cost escalation and delay. The US dropped such contracting after a number of disasters, but HM Treasury appears to demand its retention despite all the evidence to the contrary.

Projects Are Seldom Cancelled

The Smart Procurement Initiative in 1998 stated that projects would be cancelled more readily at Main Gate than hitherto at a similar approval point. This has not happened. Of course, Ministers are not keen on cancelling things on which significant sums of public money have already been spent, even when much greater sums of public money may be needed to put it all right.

Reluctance to cancel, even when other options are available off-the-shelf, can only encourage over-optimistic cost and schedule estimates at the start, with those responsible knowing that more money will eventually be made available and that ISD slippage will be accepted.

Of course major projects are cancelled from time to time – for example MLRS Phase III, Tracer and Horizon – but invariably for reasons that do not appear to discredit MoD: the examples mentioned were all blamed on other countries. Have any UK projects been cancelled because of slippage and cost overruns stemming from unrealistic MoD estimates at the start? We cannot think of any in the last decade or two. Is bad management thereby rewarded or at least uncensored?

Elsewhere in this edition, the US Assistant Secretary for the Army, the Honourable Claude Bolton, says that he has terminated 76 Army programmes in the last five years and expects to get to three figures before he leaves. He does make the point, though, that where the project manager has done all the right things, he should not be blamed for a failed project. But in deciding whether a UK IPT leader has done all the right things, more transparency in decision-making is required than currently exists.

Lack of Transparency

A lack of transparency shelters those who make poor decisions, whether individuals or committees. If decision-makers, whether IPT leaders, Directors of Equipment

Capability, programmers, industrial managers or committees, are sheltered from blame, it can only encourage optimistic decisions on cost and time in the early stages if that helps to get funding into the programme, or helps to win a competition.

Lack of transparency also makes it difficult to see what is deleted from the equipment plan when realism increases the inadequate initial budget as a programme continues, and raises the question of whether that programme is still Value-for-Money.

We believe that the UK is the only country with major development programmes to withhold future equipment programme details. Experience shows that few organisations are more adept than MoD at hiding embarrassing developments from scrutiny for long periods. The National Audit Office (NAO) has managed to prise out important facts and force lessons to be learned, but this has taken time and concentrated effort. Few organisations other than NAO have the resources to do this, and even their resources are strictly limited.

'Are there lessons to be learned from the oversight that Congress exercises over the DOD in the US?'

The defence acquisition values propounded in the DIS include the statement that 'we all must value openness and transparency; share future plans and priorities wherever possible to encourage focused investment and avoid wasted effort'. There is a long way to go.

Are there lessons to be learned from the oversight that Congress exercises over the DOD in the US? The dilemma here will be to avoid the paralysis and bureaucratic overhead that DOD experiences from such oversight. But maybe some of the US practice could translate to UK in a productive way.

Solutions

Whilst optimism describes the mood that allows wrong decisions to be accepted, the key word in the phrase is conspiracy, which describes a behavioural process between several parties, with looping reinforcement. Conspiracy here might be defined as: 'collaborative behaviour, hidden from view'. The collaboration is more often by accident than common purpose (and can even occur under different aims), and perversely it is recognised that later in the development cycle it can be entirely beneficial.

This damaging 'conspiracy' can be halted by two means: by driving the processes into the open, so that it is no longer hidden from view; and by cutting or recrafting the process loops that allow the collaboration to be self-reinforcing.

If Whitehall and Abbey Wood really want to remove this 'conspiracy of optimism' – and we wonder if they do – then there are several things that must be done.

Planning Assumptions and Aspirations

While forecasting the future is not an exact science, DPAs are of little use if they are exceeded year on year. They need to be more honest and recognise reality. Serious underfunding positively encourages 'entryism'.

The aspiration, whether conscious or subconscious, to keep up with US standards of equipment needs to be tempered with reality. We cannot afford the most capable equipment in sufficient numbers across the board and, indeed, we have already abdicated from some capability areas where we now expect the US to supply.

We need to identify and declare in DPAs those areas where:

- We do not need the most capable equipment.
- Greater numbers are essential.
- Improvements are desperately needed in the short term.
- The ISD could slip without too much penalty.
- Greater priority and funding needs to be concentrated.

Cost Estimation

More accurate cost estimating from the start will mean less cost escalation downstream and less delay while extra funding is approved. Conversely, it will reduce the number of projects that can be taken into the equipment programme. This will reduce the turbulence in procurement, allow greater commitment to programmes once they are in, and gain greater commitment and investment from industry.

Although difficult, reasonably accurate cost estimation is not impossible. Independent cost estimators, used by leading defence primes, have proved approximately right over many programmes, and there is no reason why MoD should not use them too. Parameterised estimates are often pretty accurate – but are rejected for ‘lack of detail’. It seems that MoD has now understood the need for independent cost estimation as Paragraph 9.22 of the McKane report states that Main Gate Business Cases for Category A projects should contain an independent estimate, and this is now written into the guidance on the Acquisition Operating Framework website.

We are poor at learning lessons, so MoD should set up a process for the continuous 10-year examination of past projects and other procurement issues and use the results to forecast the future, including early cost and schedule estimates.

Transparency and Accountability

Visibility of decisions needs to be improved. The equipment programme should be published with identification of those responsible for each project and how their responsibility is circumscribed. Committee decisions, too, need to be more open.

As fixing more than one, or possibly two, of the variables of cost, time and performance is not possible, the key criterion for each programme should be identified so that trades can be made when necessary between the three.

Cancellation of Programmes

In the US when a programme breaches its cost ceilings, DOD has to testify before Congress that there are no alternatives to continuation. MoD should adopt a similar process and be more willing to cancel programmes where cost or schedule have escalated unacceptably and where there

Air Marshal The Lord Garden

Air Marshal The Lord Garden died last month and his obituary, which appears on the RUSI website, paid tribute to him: ‘He combined his professional military experience and his own considerable intellectual powers to offer incisive and penetrative analysis of all the major strategic questions affecting the UK’.

Tim Garden was a most valued member of the RUSI Acquisition Focus, providing clear views and positive advice based not only on his programme planning experience in MoD as Assistant Chief of the Defence Staff (Programmes), but also on his political perspective from the House of Lords. He will be sorely missed.

are viable alternatives – the prospect of cancellation should concentrate minds, particularly when early cost and schedule estimates are made and agreed. However, decisions to cancel must not be based only on cost and schedule overruns, but must take into account realistic alternatives and military imperatives, otherwise there is a danger that cancellations could lead to an unbalanced equipment programme where the main criterion is good financial and schedule management of projects.

Integration and Technology Risk

The low level of funding for research and technology (R&T) starves projects of a flow of mature technology as well as the ability to demonstrate technology early in the cycle. There is a need to separate, in time, technology development from programme development while bringing management of technology and programmes closer together and making more frequent and more informed use of spiral development.

projects, but it is still too low. Technology options must not initially be costed as mature unless they clearly are.

Technical interfaces will not come right without a full understanding of the technical and operational factors. As few systems are not networked, effective and imaginative test environments for the interfaces that networked systems have to handle must be used. The cost and schedule implications of interface design and testing must be built in from the start. Integration remains a poorly considered aspect until it becomes an imperative, which gives rise to increased cost over what might have been achieved had it been tackled proactively.

Programme Management

The ‘wicked programmes’ (including IT programmes) need different management skills from smaller, less complex projects, and a different approach, led by a different style with a wider breadth of understanding, greater initiative and less process constraint. As a senior, and highly respected, civilian manager of a very complex project said: ‘The trick is to understand what rules you cannot break, then bend all the others if necessary to destruction.’

And since many more programmes now are information rich, they deserve the same degree of holistic risk management as much larger programmes. Networking the battlespace inevitably increases the number and importance of interfaces between projects. The Equipment Capability Customer (ECC) should exercise an imaginative determination to envisage the battlespace and insist on interfaces being managed properly. This may lead to a requirement for more staff for the chronically undermanned ECC.

Strategic partnering with industry could well improve the quality and pace of joint

‘Strategic partnering with industry could well improve the quality and pace of joint decision-making, as was demonstrated in the DIS Pathfinder programmes’

Greater funding of the early stages of a project’s procurement cycle has been called for over many years. The importance of this is now generally recognised and a higher level of funding is now provided for many

decision-making, as was demonstrated in the DIS Pathfinder programmes, but whether this will improve management of interfaces with other programmes in DE&S and on contract to other defence companies is doubtful. But clearly, changes to both organisation and process are needed.

Education

It is widely held in the USA that the US Defense Acquisition University at Fort Belvoir has blown a fresh wind through the US DOD and has created a body of shared expertise and open-minded approach that reduces the tendency to run defence acquisition as if it were a conspiracy against the public.

If the conclusions of this paper and similar work were to be factored into the teaching at DMTC Shrivenham, we may build a body of professionals who conduct acquisition in a more open-minded and less conspiratorial manner.

Conclusion

It could be asked whether we would want anything other than optimism within the equipment programme. Would a 'conspiracy of pessimism' be preferable? The answer is yes and no. The 'conspiracy of optimism' drives a bow wave that is now threatening to become a tsunami and will at the very least mean that many projects will be further delayed for funding reasons downstream (risking obsolescence or irrelevance) or severely reduced in numbers or capability. The latest NAO Major Projects Report shows that, since approval at Main Gate, the top 20 programmes have been reduced in capability/numbers by £1Bn as part of the effort to stay within cost constraints, caused partly by optimistic estimates. What effect these reductions have on each programme or the overall defence capability is not clear, and it is doubtful whether value judgements have been rigorously made in all cases.

On the other hand, a 'conspiracy of optimism' does get more programmes into the equipment programme, and to some extent, therefore, is beneficial to the Armed Forces. However, the optimistic climate not only drives behaviours but leads to dishonest decision-making. Everyone knew, or should have known, that the initial costings for CVF were wrong, but they accepted them as a price for getting the carriers into the equipment

Breaking the 'Conspiracy of Optimism'

Solutions

Improve Transparency and Accountability

- Publish the equipment programme.
- Increase transparency of decisions to expose accountability.

Improve Reality in Assumptions and Aspirations

- Make Defence Planning Assumptions realistic rather than 'affordable'.
- Trim aspirations to reality.

Improve Cost Estimating

- Provide independent cost estimations. Make more use of parameterised techniques.
- Carry out a 10-year examination of projects to help in forecasting the future.

Cancel Programmes More Readily if Viable Alternatives Exist

De-risk Technology and Technical Interfaces Earlier

- Understand and test technical interfaces better.
- De-risk technology earlier and only cost technology as mature if it clearly is.

Improve Management of Complex Development Programmes

- Manage risk holistically – financial, integration, obsolescence, operational and political.
- Manage the large, complex development programmes with a different skill set and a greater emphasis on problem exploration, option generation and analysis before decisions on solutions are made.
- Ensure that interfaces between projects are better managed.

Abandon Fixed-Price Development Contracting

- Adopt a more incremental approach to funding.
- Use more joint teams to develop and assess options.

Education

- Factor in the above solutions to teaching at DMTC Shrivenham.

Table 1: Solutions

programme. This could be called 'institutional dishonesty'.

This term is a far more accurate reflection of the behaviours at play because of the perception that being honest won't get the job started, and this is compounded by the view: 'Don't worry, once we've started they won't be able to stop it, and when the real cost comes out later, they'll have to find the extra funds'. This attitude prevails on both sides of the MoD/industry divide, despite individual protestations to the contrary.

Although the 'conspiracy of optimism', or 'institutionalised dishonesty', does help

to get programmes into the equipment programme, the unrealistically low initial cost and schedule estimates cause large cost variances to budget and delay to in-service dates, fuelling turbulence in the equipment programme and undermining commitment to particular projects.

Several improvements, which are shown in Table 1, can be made to reduce, or eliminate, this 'conspiracy'. We do not believe it is possible to 'cherry pick' these: it is all or nothing. The key is whether Whitehall and Abbey Wood really wish to tackle it or whether they prefer to live with it. ■