

## REVIEWS

# Reviews of Books and Reports

## BOOKS

**A VIEW OF AIR DEFENCE PLANNING  
IN THE CONTROL AND REPORTING  
SYSTEM, 1944-1964**

by R H G Martin

ISBN 0-9546017-0-X, 195 pages,  
Alden Press, 2003, £32.50

Richard Martin joined the Air Ministry Research Establishment (AMRE) in October 1939. Thereafter he worked on several ground radar projects including radar displays, glider-borne radar ground stations, and digital radar data extraction and processing. He was directly involved in the planning of the UK air defence architecture before he left the Royal Radar Establishment as a Principal Scientific Officer, in 1964. Consequently, he is ideally qualified to record the history of UK air defence planning between 1944 and 1964, and he has now published the fruits of his researches privately.

As a V-bomber man I have always been interested in the history of the RAF nuclear deterrent. Yellow Sun thermonuclear bombs, V-bombers on dispersals, imaginary Dr Strangelove-esque flights deep into the Soviet Union – these were the glamorous aspects of RAF life. But what was often forgotten was the air defence and warning dimension of the British nuclear deterrent equation. If the bad guys could have mounted a successful pre-emptive strike on the UK, there would have been no bomber force to retaliate.

It is this aspect that Richard Martin addresses. You had to stand in the former Bloodhound control centre at North Luffenham, or gaze at the massive boilerplate Type 85 radar at Neatishead, to appreciate the effort and expense that went

into the air defence of the UK in the 1950s and 1960s. Richard Martin is the first author I have come across to outline the development of the Control and Reporting (C & R) systems, successively known as Rotor, Ahead and Linesman, between 1949 and 1964. He stops then, I assume, because BMEWS at Fylingdales was coming on line.

The strength of this book is that it raids the Ministry files and records them verbatim. Thus, if you want to read the Air Ministry note outlining staff thinking on the manned threat to the UK, it is all there including CDS's covering memo to the Minister of Defence. And if you are the sort of 'anorak', like me, who appreciates knowing about basing, building layout, Bloodhound numbers and the possibility of Fighter Command using nuclear-tipped air-to-air missiles, this book is a mine of valuable detail. There are so many little interesting asides that come out, such as how much was decided by middle-ranking specialist officers with perhaps the odd air commodore for top cover. Nowadays, the RAF seems to need a host of 2-star engineers to deal with far less.

The downside of this book is that it reports without colour or comment. Pages 117 up to the Index are appendices full of technical data, whereas pages 1-111 are little more than a chronology of file transcripts. Only pages 112-115 set themselves out as a summary and conclusion, which is really only a reprise of some previous points, a stroll down memory lane and some throwaway lines about Blue Streak and TSR2. What Richard Martin's researches cried out for were some recollections from the people who employed the kit, an idea of overall costs to UK plc and, ideally, some Soviet view on whether all the C & R effort met the primary aim of 'convincing the Russians that they cannot attack the United Kingdom's nuclear retaliatory forces with

any assurance of neutralising them and thereby avoiding nuclear retaliation.' In other words, the files make fascinating reading, but they need setting in a real world context.

In sum, this is a fascinating ramble through the Air Ministry archives and if you are seeking facts on the genesis of Rotor, Ahead and Linesman/Mediator, *A View of Air Defence Planning* is the book for you. But it does not come cheap. I recommend it for dipping into for an insight into national defence thinking when Britain was still a world power.

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## REPORTS

**BATTLEFIELD HELICOPTERS****National Audit Office  
HC 486 2003/04 7 April 2004**

This is a pretty devastating report. Predictably, the media latched on to the horror story of the procurement of the upgraded Chinooks. Eight of the Chinook fleet were to be procured to an enhanced HC3 standard with an In-Service Date of 1998 but, although the helicopters were accepted in December 2002, they can only be flown in cloudless weather above 500 feet, a constraint that will remain until 2007. The report states that MoD,

*'... has been unable to discover an audit trail to explain why no action has been taken to contract for the remaining elements of the requirement, although it would appear that lack of funding has played a significant part.'*

The story is a must-read for everyone, but especially for those who are responsible for the acquisition process in MoD.

However, the key finding of the report is that there is a serious shortfall in battlefield helicopter lift and that this will remain until at least 2017. The overall deficit is given as 38 per cent, but if the 'Harmony' guidelines (MoD's balance between operations and exercises on the one hand, and training, recuperation and leave on the other) were to be observed, the deficit would rise to 66 per cent. On top of this:

*'Many platforms lack the ability to operate effectively in warfighting environments ... shortfalls exist in the areas of communications, helicopter protection and nuclear, biological and chemical warfare protection for aircrew.'*

In Iraq, there was also a shortage of sand filters:

*'Sufficient filters remained for 3 Regiment, Army Air Corps to deploy only 12 Lynx aircraft. Ordinarily the Department would have wished to deploy its entire Lead Aviation Task Force, including 23 Lynx helicopters. Therefore, rather than the mission determining the force package, the lack of suitably-equipped aircraft limited one of the principal weapon systems available to 16 Air Assault Brigade.'*

These shortfalls in operational capability were, in many cases, due to MoD's policy of relying heavily on Urgent Operational Requirements (UORs). As the report mentions, the UOR process strains availability, supportability and efficiency, and creates fleets within fleets. Equipment, some of it complex and

logistically challenging, too often arrived too late for the required familiarisation and training to be carried out. This is another example of why the whole UOR policy needs a re-think.

The report states that significant progress has been made by the Joint Helicopter Command. The joint employment of helicopters has increased efficiency, and progress has been made in harmonising operating and engineering standards across the Services, but the report adds that there is scope for further improvements, including more consistency in applying airworthiness regulations and processes across the three Services.

The recommendation that aircrew ranks should be reviewed is important, but will prove difficult because it may well be perceived as undermining Service ethos. However, the policy of the Royal Navy and RAF of allowing only officers to pilot helicopters would appear to be increasingly untenable when the Army has twice as many non-officer as officer pilots. It is just not credible to insist on an officer flying a Chinook when most of the future Attack Helicopter pilots will be non-commissioned officers.

Just as important is rationalisation of command ranks. Whereas majors command army helicopter squadrons, RAF squadrons are commanded one rank up, even though the number of helicopters in each is similar. There appears to be no basis for keeping the status quo.

The report does not cover the Attack Helicopter as the National Audit Office reported on this subject in 2002, but reading the two together is instructive. Although helicopters are vital for

executing land and littoral manoeuvre concepts, the clear conclusion to be drawn from these two NAO reports is that there is much that needs to be put right – and quickly.

*Bill Kincaid*  
RUSI ■

## MOD: MAJOR PROJECTS REPORT 2003

### National Audit Office Report HC195 2003/04, 23 January 2004

The media headlines, after the publication of the NAO Major Projects Report in late January, focused on the cost overruns and delays in four equipment projects. However, those knee-jerk reactions were hardly enlightening because the real story is far more complex than it appears from those superficial reports.

At first sight, the £3.1bn increase in just one year is very bad news for it is as high as the overrun in 1997, the year Smart Acquisition was launched to overcome these problems. But the figures are on two different price bases and, in real terms, last year's cost overruns are considerably smaller. Success? No, for the 1997 figure was the increase on 25 projects, whereas the 2003 sum is that on only 18 projects. Thus, in real terms, the 2003 average increase per project is similar to that in 1997. This suggests that, despite all the efforts of Smart Acquisition, things have not really improved.

However, the major contributors to this black picture are four pre-Smart projects: Astute, Nimrod, Typhoon and the Advanced Air-Launched Anti-Armour Weapon (AAAW), which together are responsible for an increase of £2.7bn within the year. In contrast, those projects

that post-date the start of Smart Acquisition, have cost increases of only 2.1 per cent which compares very favourably with the 10.9 per cent of legacy projects.

The figures on delays show a similar picture with legacy projects slipping far more than Smart projects. On a superficial level, therefore, it would seem that Smart Acquisition is succeeding. But only on a superficial level. As Pete Worrall, an IPT leader in the Defence Procurement Agency, says elsewhere in this issue:

*'What we usually see in practice on many major acquisition projects is good progress at the start and then, in the latter half of the project, a slip.'*

The Smart projects are still in the earlier stages of their procurement cycle, so we will not be able to tell much about improvements under Smart Acquisition for a few more years yet. It would be nice to think that things are getting significantly better, but the NAO report posts a warning:

*'Some [newer] projects may be continuing to follow the historic trend of cost increase and delay as they mature through the Procurement Phase.'*

And this was underlined by the Chief of Defence Procurement (CDP) in his evidence to the House of Commons Defence Committee on 12 May this year, when he said that poor performance was endemic and that there were clear signs that Smart projects might not meet targets downstream.

The report points to an important factor in both cost and time overruns. It suggests that some risks are still not being fully understood or taken into account when decisions are made to commit substantive funding at Main Gate, and that the average level of expenditure is well below that suggested for such risk reduction activity under Smart Acquisition. Downey, Jordan-Lee-Cawsey and McKinsey's have, over the last 35 years, all recommended 15 per

cent as the proportion that should be spent on the early stages of a project, while the current spend appears to be around 4.4 per cent.

But this is not the only reason. CDP also said that, of seven fundamental Smart Acquisition aims, only one had been met.

A superficial reading of the report can be misleading for another reason. The in-year variations are clear enough, but the overall slips and cost overruns are calculated from the last major decision point. Thus, slip on Bowman is shown as zero, which of course it is when measured from the target set at Main Gate. But we know that is not so, and to get the true picture, it is necessary to turn to Appendix 3 and look under Bowman Section 5 to see the true historical analysis: that Bowman has slipped 92 months since Initial Gate.

The report, therefore, is well worth reading in detail, and then comparing with other Major Project Reports over the last decade. But these reports, valuable though they are, concern major projects only. What would be most valuable would be similar reports on smaller projects on a regular basis. Then we might have a clearer view of the progress or otherwise of Smart Acquisition. But is that too demanding on resources?

Bill Kincaid  
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## MANAGEMENT OF DEFENCE RESEARCH AND TECHNOLOGY

### National Audit Office Report HC360 2003/04, 10 March 2004

The report by the National Audit Office (NAO) on one of the greatest failings of the last ten years – that of defence research and technology – is most welcome, even though matters may have reached that point of terminal decline forecast years ago. NAO notes many areas where MoD is taking initiatives to improve matters, not least in management, and concludes that

these have the potential to improve the research programme. It is noticeable, however, that it repeatedly caveats these with statements that more needs to be done. And how right that is.

The key issue since the fall of communism in Eastern Europe has been the steep fall in MoD funding of research and technology. This is starkly borne out by a graph that shows that, while the defence budget has remained almost constant in real terms, the research budget has declined since 1994/95 by about 30 per cent, and this is on top of a major reduction in the years immediately before this. This might seem bad enough, but it is compounded by the declining ratio of that research budget spent on technology as opposed to advice – now only 23.5 per cent. In other words, MoD is spending only £100M per year on technology generation. And MoD claims that it cannot afford more!

But there is worse news still. That tiny budget is not spent effectively. For many years, it has been clear that pull-through of MoD-funded research into the equipment programme has been considerably less than it should have been. This has now been recognised by MoD, the report stating:

*'Improving the pull-through of technology from the Research and Technology programme to the delivery of defence equipment is important and part of the Department's new approach is to improve performance in this area.'*

Competition later in the procurement cycle is one barrier to pull-through, but the NAO touches on another that is probably more significant – the so-called 'valley of death':

*'As technology moves towards application into equipment, there is a transition between the two budgets [the Research Building Block and the Equipment Programme]. This budget division reflects the structural division between research and acquisition activities within the Department. The Research Building Block funding tails off while the Equipment budget ramps up.'*

This “valley of death” is illustrated and clearly shows two main reasons for the paucity of funding prior to major investment decisions. The first is the tailing-off of research funding, just at the time when technical demonstration is needed to de-risk the technology; and the second is the failure to spend the repeatedly recommended amounts during the early stages of a project.

*‘Procurement risks are exacerbated within the Department by the relatively low spend prior to the main investment decision. As a guide, up to 15 per cent of the total procurement costs should be spent before reaching the main investment decision point, but data from the National Audit Office’s Major Projects Report shows the Department is currently achieving an average of around 5 per cent.’*

This means more money up-front. The report goes on to say that:

*‘There is more the Department can do to manage its expenditure on technology demonstration coherently and to bridge the gap between work funded from the research and equipment programme budgets.’*

This means even more money up-front. But if MoD is serious about de-risking, then that money will have to be found. In the overall context of the defence budget, we are talking about peanuts.

The report congratulates MoD for making good progress on introducing competition within the research programme, progress that has improved bid quality. However, only 10 per cent of the research budget was competed in 2003 / 04, although it is planned that this will rise to just over 60 per cent in 2009/10.

This may widen the defence research base in this country, as is MoD’s aim, but this may well be at the expense of depth: the same amount of money divided amongst many more companies and organisations will mean less for each. Expertise can only be built up by repeated research in a particular area by the same expert team and is, therefore, less likely to be achieved in the future.

Does anyone care if the research base becomes less expert? It seems not, but one body should and that is the Armed Forces. While equipment can increasingly be bought from abroad without obvious capability shortfall, MoD’s policy of relying on Urgent Operational Requirements (UORs) for additions and upgrades immediately prior to hostilities can only be effective if we retain three things: an expert MoD; a healthy, indigenous industrial base; and a strong research foundation. Whatever may be happening to the first two, we appear to be losing the third – for want of some peanuts.

*Bill Kincaid*

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## WHAT DRIVES SUCCESSFUL ACQUISITION?

**National Audit Office  
A Briefing and Consultation Document,  
26 March 2004**

For many years, the Major Projects Report has highlighted the variable performance of defence procurement projects. Both the Major Projects Report and much of the analysis underpinning Smart Acquisition have focused on the internal acquisition processes of the MoD. Relatively little work has been done to understand the broader influences on the success of those processes and how they can best be managed. The National Audit Office, working in partnership with the MoD and with help from PA Consulting, has been working to understand the broader influences on successful acquisition and to identify lessons from outside practice to feed into successful management of the drivers to help improve the delivery of defence equipment capability.

The NAO’s analysis has been split between through-life acquisition performance and procurement performance. It emphasises the importance of influences such as the budgetary process and the availability of suitably skilled and qualified staff and explains how the various influences link together to affect successful acquisition. The model also highlights some more

surprising outcomes, notably that competition does not feature as a key driver of successful acquisition. The modelling explains why this is the case and, in so doing, re-affirms the importance of both the MoD and industry’s ability to understand risk and put cost and timescales estimates on activities, and the extent to which its governance and assurance processes pick up potential optimism or lack of reality in contracts.

In March, the NAO published a summary of the results of their modelling work in a hardcopy report. The complete model, together with a series of more detailed maps to aid understanding of the dynamics surrounding, and feeding into, each of the key drivers and the relationships between them, is available on a specially designed website [www.nao.defencevalueformoney.org](http://www.nao.defencevalueformoney.org). The next stage of the NAO’s work will take some of the key drivers and compare the MoD’s approach in managing them with outside practices. This will involve a broad consultation exercise and in-depth analysis of selected commercial organisations and overseas defence departments. The first area which the NAO has selected for study is ‘Tracking the Progress of Major Projects’. It is expected that the report will be published later this year.

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## LESSONS OF IRAQ

**House of Commons Defence  
Committee  
HC 57 Session 2003/2004,  
16 March 2004**

The House of Commons Defence Committee (HCDC) report, *Lessons of Iraq*, is as expected a comprehensive and balanced view of the operations in Iraq.

While it covers everything from planning and strategy to the use of reserves, and from force balance and deployment to personnel issues and costs, it is the use and performance of the equipment which is probably of the most interest to many readers of *RUSI Defence Systems*. HCDC reported that, overall, the major equipments performed well and that reliability was high: availability of Challenger 2 was 90 per cent and that of AS90 95 per cent. However, it also noted that, because of the nature of the operation, much of the equipment was not tested to the full.

Conspicuous successes included the Cruise Missile T-LAM, the mine counter-measures capability, Sea King Mk7, the desertised Challenger 2, AS90, Warrior, the Bowman personal role radio, Tornado, Storm Shadow and C-17.

In many areas, therefore, equipment performance was as good as, or even better than, expected. Some equipment, though, fared less well than anticipated, including the Combat Engineer Tractor with availability of only 50 per cent, the Lynx helicopter with availability of 52.6 per cent and the Landing Craft Vehicle Personnel (LACP) which was reported as old and unreliable, either not starting or breaking down when transporting personnel from ship to shore.

These disappointments were perhaps of limited impact. However, in a few areas there were major weaknesses. Communication and information systems (CIS) was one such area. It was reported that CIS could not easily support the information exchange requirements of the Iraq operation, that the limited degree of interoperability between UK and US CIS had an impact on the ability to support coalition planning and operations, that Harrier and helicopter operations were impeded by the lack of secure communications, and that the force sometimes had difficulty in maintaining strategic communications

between the UK and forces in-theatre. The Committee expressed its view as follows:

*'While we acknowledge that work is in hand to address these shortcomings, we find it very worrying that it will be some time before any real improvements will be seen, particularly given the frequency with which UK Armed Forces are now involved in operations, and the increased need to communicate effectively not only within UK forces but also with our allies.'*

Combat identification was another area to be criticised. Despite MoD claims that deployment of panels and the lease of a minimum number of US Blue Force Tracker equipments were largely effective, there were several incidents of fratricide. The Committee accepted that fratricide would remain a fact of life but looked to MoD:

*'To identify the required action and make the necessary investment to ensure that such incidents are reduced to a minimum.'*

It does seem extraordinary that, despite the importance attached to minimising fratricide in the wake of the 1991 Gulf War, very little effective progress has been made.

But the most glaring weakness was in the logistic chain. Despite the Secretary of State's earlier dismissal of reports of shortages of equipment, HCDC found evidence of significant shortfalls of desert clothing and boots, of body armour and small arms ammunition, and of NBC detection and protection equipment:

*'We are in no doubt that one of the key lessons to emerge from Operation Telic concerns operational logistic support and, specifically, the requirement for a robust system to track equipment and stocks both into and within theatre – a requirement which was identified in the 1991 Gulf War. The lack of such a system on Operation Telic resulted in numerous problems with*

*the in-theatre distribution of critical items such as ammunition, body armour and NBC equipment. MoD has told us that having such a system is top of its logistics priorities and we understand that proposals will be submitted to Ministers in the spring.'*

The lack of an effective asset tracking system was not the only challenge that the logistics organisation faced. Another was the reliance on Urgent Operational Requirements (UORs) to deliver or upgrade equipment immediately before operations, rather than fund these requirements during the normal course of procurement. The use of UORs is sensible in many cases, but in others the timelines are such that equipment cannot be produced, deployed and trained on in the time available. HCDC concluded that:

*'Much of the equipment procured as UORs made a significant contribution to the success of the campaign and, in most cases, industry supplied equipment at very short notice. However UORs are not the solution in every case. MoD needs to be better informed of which types of equipment and capabilities can be delivered in UOR timescales – there were a number of cases where equipment was not delivered by the time required or where users did not have the full complement. We do not consider that MoD planning properly recognised that the delivery date for a piece of equipment and the date by which a capability is achieved are not the same. If personnel are to be confident and fully efficient with their equipment there must be adequate time for familiarisation, training and integration. Furthermore ... we believe that the risks of relying on UORs, instead of holding adequate stocks, are not sufficiently well analysed or understood in MoD's risk assessment processes.'*

Many would agree with that.

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