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Prospects for a European Ballistic Missile Defence System

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EXECUTIVE SUMMARY

- The current BMD debate in the European NATO states differs significantly from that of the 1980s. While European states may agree with the US on many of the technical evaluations of the WMD threat, they differ in their judgements of its timing, significance and the methods of dealing with it.
- For many of these European states, the issue of acquiring a similar type of missile defence to that proposed for the United States, namely one covering all their territory (an EBMD), is just not on their security agenda, nor do they want it to be.
- The most likely trigger for a debate on EBMD will be a US proposal to push ahead with an NMD, and to offer to share the technology with European NATO states.
- An EBMD debate would inevitably open up politically significant gaps between the European NATO states. Fault lines seem likely to occur in four areas: imminence of the threat; force projection outside of NATO-Europe; deterrence of Russian capabilities, and industrial partnership issues.
- Many European would see such a debate as being linked to the future of NATO. They may thus feel pressured to go along with considering an EBMD even if they see no pressing need for it.
- Once the United States makes a decision to proceed with NMD, the European states, both within and outside NATO, will be subject to conflicting pressures from the United States and Russia. These would probably take the form of either accepting US arguments for its need of an NMD, or developing a closer and more direct political relationship with Russia to neutralise its threatened political effects for European security.
- European concerns over Russian responses to a US decision would focus in particular upon the INF Treaty and the MTCR.
- The impact of an EBMD upon Russia appears to be heavily dependent upon the assimilation of Russia into a constructive US-Russia-NATO relationship, perhaps, *inter alia*, involving it having the role of a provider of technology and other assistance in building an EBMD. In its absence, Russia may regard the US-NATO partnership and the combination of NMD and EBMD as devices to give the partners unfettered freedom to intervene in the affairs of other regions using their advanced conventional weapons.
- System architecture should figure large in any debate on EBMD. It will be dependent upon which states wish to be defended; the type of system adopted; and the availability of technology from either the United States or Russia.
- Participation in an EBMD would determine where its facilities, such as radars, interceptors, command and control systems and other elements would be situated. This in turn would generate perceived vulnerabilities to pre-emptive strikes and to debris from interceptions. Both of these issues are likely to be highly sensitive politically.
- The choice of architecture, whether territorial shield or boost-phase intercept, would revolve around the availability of the technical building blocks for each type of system and its political implications.
- Boost-phase has considerable political attractions, as it is capable of being targeted against specific states: it also has the potential to be a joint European NATO/US system, in contrast to a non-space based territorial shield. However, it would have to be near-automatic in operation, while the political decision to deploy such a system into a threatening region might prove difficult to take.
- A territorial shield EBMD would need to be designed to address a range of ballistic missile threats, and thus would need to consist of several different systems [short, medium and long-range] integrated together, a problem that does not confront either a US land-based NMD or a space-based system.
- EBMD would also necessitate a single European common command and control structure. Europe is not a single state and, without that political context, the necessary infrastructure, procurement and command and control decisions to create an integrated NATO EBMD along US NMD lines appear too difficult to contemplate. This also implies that any US offer of technological partnership in an EBMD may be highly problematic.
- Without the further development of political integration in Europe, an EBMD may not be achievable, and thus logically an EBMD linked to the EU may be more feasible than one linked to NATO. Yet while an EU-Europe might offer a more permissive political infrastructure for the development and deployment of an EBMD, its nature, technological base and motivations would

probably be significantly different from a NATO-based EBMD.

- Nevertheless, it may be useful to discuss concepts for an EBMD system that would facilitate adaptation; that were layered; which might be affordable; and which would have a modern, open architecture. Such a system could then form the basis for an effective EBMD if, at some future point in time, the political processes of Europe had proceeded to the point where such a completely integrated EBMD was possible.
- For the "states of concern", regional conflict appears to be the main driver of missile proliferation, and thus their response to EBMD is unlikely to be to abandon development of missiles with increasing range. Moreover, EBMD might serve to justify and accelerate such proliferation, especially if the deployment of a boost-phase system made the identity of target states transparent.
- China seems unlikely to a driver for EBMD, but at the same time it is difficult to see how EBMD would be a driver for Chinese nuclear or other defence policies, except through perceptions that it was a political and military extension of a US NMD.
- Any future NATO debate on US NMD and EBMD must recognise the unique geographical, technical and political challenges of extending US missile defence technology to its European NATO allies. NATO needs to explore the detailed operational requirements for such a system, in a similar way to the process it has just initiated for a TMD.
- This intra-NATO process could also be complemented by a NATO-Russian co-operative threat reduction initiative, and by moving forward with the MTCR Code of Conduct Against Missile Proliferation/Russian GCS discussions, to create an alternative, politically driven path to address the problem of opaque missile proliferation, and by extension opaque intentions.

INTRODUCTION

The arrival of the Bush Administration in the United States was accompanied by an inauguration speech that pledged "we will build our defences beyond challenge, less weakness invite challenge. We will confront weapons of mass destruction, so that a new century is spared new horrors". This appears to make it inevitable that, for the third time in the post-war era, missile defences will be at the heart of the global and European security debate.

The first such debate, in the 1950s and 1960s, concerned the priorities to be given to a land and air based anti-aircraft, and then anti-missile, defence of national territories, cities and nuclear deterrent bases by the United States, Britain, and NATO. This came to an end with the ratification of the ABM Treaty, and the acceptance of Mutual Assured Destruction (MAD) as the basis for future strategic stability. The second debate, the Reagan-era SDI controversy from 1983-8, grew out of an innate US desire to recreate the inviolability of its homeland that it had enjoyed prior to the missile age, and the apparent prospect of new nuclear and space technologies that might make the defence of both the US and NATO Europe feasible. The programme was based on a concept of "common defence", and the co-operative development of the necessary technologies through memoranda of understanding between the US and its allies.

A common thread in all three debates is the combination of heightened US concerns over potential threats (immediate, medium and long term), and the timelines of possible military responses to them. A second common theme is the potent political effects of even the most preliminary debates. The very act of promoting SDI had significant effects on the contemporary strategic situation, even though the technologies that were driving the debate remained decades away from deployment. NMD involves major technological uncertainties, but its political effects have been both instant and global.

Despite these similarities, the context of the current debate over NMD, and any future one over a European ballistic missile defence (EBMD), is very different from that of the previous two in several key respects:

- There is no longer a consensus between the United States and European NATO or EU members on the ordering of the security threats which face them. Unlike the Cold War period, the USSR nuclear threat no longer acts as a common cause of concern to generate a sense of shared fate if war should occur;
- The current non-nuclear technology of NMD cannot easily be extended to cover Europe, or be transplanted into the European theatre, since NMD is concerned with ICBM intercept and the ICBM threat to Europe is currently regarded as minimal. Thus the political aspirations of the Bush administration to offer a common defence for Europe and the United States differ radically from the technical realities of what is possible, as does the scope for co-operative development;
- EU and NATO European states base key elements of their security, especially against WMD, upon sustaining the fabric of the existing cooperative arms control regimes. The current US administration is inclined to minimise this element in its security calculus, and emphasise self-help instead;
- Since 1993, philosophical divisions have opened up between the United States and Europe over how to handle missile and WMD proliferation. This is one example of the broader issue of defining and establishing a desirable future relationship with Russia, China and potential proliferators. Thus decisions on NMD and EBMD involve wider questions of international order, as well as the specifics of missile proliferation and defence;
- NMD and EBMD threaten to play the same role in the 2000s as the neutron bomb and INF missiles played in the late 1970s and 1980s: a coded language for debates over the future of NATO, and the political and military relationship between the US and European states. Thus a political priority to sustain alliance solidarity could lead to policies on missile defence that are militarily, economically and strategically sub-optimal, if not self-defeating.

Together with these changes in political and strategic context, three recent developments have combined to make an examination of the prospects for an EBMD timely. First, the robust commitment to NMD deployment by the Bush Administration means that European states are going to be compelled to think seriously about how such a deployment affects their own security calculus. This will depend in part on *how* the United States pursues NMD, and the effect this has on the international security environment: in particular, the consequences of NMD for arms control and multilateral non-proliferation will be important.

Second, both the United States and Russia have publicly claimed that they are willing to transfer their missile defence technology to European states for the construction of an EBMD. Third, the proliferation of ballistic missile technology means that long-range capabilities are likely to emerge on the south-east periphery of Europe.

Taken together, these three developments mean that, whether they wish to or not, European states will need to make decisions about missile defence, even if they are the negative ones of choosing not to embark upon it. This paper has therefore been written to shed some light on some of the currently understudied elements of the international missile defence debate, namely whether the European NATO members want a missile defence for themselves, whether they need it, and whether the technology exists to give it to them. It identifies the differentiated political concerns over these issues that exist within Europe, and between Europe and the United States. These differences arise from history and geographical position; the central role that arms control agreements, especially the INF Treaty, may play in the way these concerns could evolve; the centrality of Russian perceptions and actions with regards to this matter and the comparative irrelevance of those of China; and the very different perceptions of threat and system architecture that exist when missile defence is viewed from the stance of those in Europe and the United States.

The first section of this report highlights these differences, and indicates the developments that would be necessary for European states to make a decision in principle to construct an EBMD system. The second section, assuming that this decision has been taken, looks at the formidable techno-political problems that would confront any attempt to construct EBMD. In other words, these two sections answer the questions of (a) what would stimulate European states to want a missile defence system; and (b) what would the system look like? For the purposes of this report, we take a "European" missile defence to mean one designed to protect the national territories of NATO's European members. In the following three sections, we examine the consequences of such a decision: assuming that EBMD has become desirable and practical, what would its probable impact be? We concentrate on its effects on relations with Russia, China, and the missile-possessing 'states of concern' on the south-eastern periphery of the Alliance. In effect, we have set ourselves to provide a European analysis of the prospects for missile defence, using the criteria set by former President Clinton: is there a threat, is defence cost-effective and feasible, and will it have a manageable impact on strategic stability?

PART ONE
ESTABLISHING EBMD

Any analysis of the perceptions of European and other states on establishing an EBMD system to defend the homelands of the European NATO members must distinguish between two possible starting points. One is a first–order political decision in principle to deploy such a system, similar to that taken by President Clinton in 1996. The other is the second-order reactions of the European NATO states to decisions on the detailed architecture of the system, when parochial 'not in my back yard' issues over the siting of system facilities and other such matters may colour specific national views concerning the system. These practical questions, concerning system architecture and implementation, are dealt with in the next section. In this opening section, our main focus is upon the requirements for a decision in principle to develop an EBMD. This entails going beyond current NATO discussions on procuring a Theatre Missile Defence System (TMD), to consider a defence of NATO European territory as a whole.

Currently, there is no active public debate on whether such a defence is desirable or feasible. Thus any attempt to identify the factors which would colour judgements on this matter in NATO states is inevitably speculative. Less speculative are the differences that are already visible between the US and its European allies over how they view the need for a US NMD; its impact upon strategic stability; and the consequences of this US policy for Europe. As a result, this section examines the considerations that will influence the thinking of the NATO European states, both individually and collectively, about the idea of an EBMD system, and what developments might lead them to support it.

The Positions of Key European States

Given their geographical position and history, it is inevitable that individual European states will have different perspectives on both a US NMD and an EBMD. As debate has already been joined on NMD, evaluating how individual states will be affected by this is markedly simpler than in the case of an EBMD. With the exception of Britain and Denmark, none seem likely to be asked to provide support facilities for a US NMD, although this is contingent upon the technology used. Thus those two states alone seem to be in a position to be directly affected by, and to be able to exert some direct political influence over, US policy.

The initial reaction of both states, as with all the allies, has been to regard such decisions as both currently unnecessary and dependent upon their future context — in particular whether the ABM Treaty has been amended by mutual agreement between the US and Russia. Recent debates in the Danish and Greenland parliaments both stressed that satisfactory amendment of the ABM Treaty was a necessary precondition of consent over use of facilities at Thule, and the Greenland parliament went so far as to say that permission would be withheld if the ABM Treaty was abrogated.[1] The UK position similarly hinges on the amendment of the Treaty, rather than its abrogation, as a precondition for co-operation. However, if consent were given, this would make Britain and Greenland outposts of US territorial defence. This is already generating public concerns that they would become the targets of an asymmetric attack by a 'state of concern', if the arguments on the need for an NMD the US were also to be extended to these states.

Yet both faced similar threats during the Cold War when they hosted US nuclear bases and staging posts, and such a threat would probably be viewed as having a lesser risk of implementation than those of the past. In addition, Britain can respond to any threat or use of WMD against its territory or forces with counterthreats from its own nuclear deterrent capability. This might also be regarded as neutralising threats arising from UK strategic military presence in areas of regional conflict, such as the Middle East. While both states could conceivably refuse the US the use of their facilities at Thule and Fylingdales, and thereby make NMD deployment more difficult, to do so would mean a redrawing of the boundaries and terms of their existing defence co-operation with the US in an exceptional manner.[2]

In the case of the emergence of EBMD as an item on the NATO or EU agenda, some guidance for possible attitudes of key European states towards it can be found in government or parliamentary reports on the implications of WMD and missile proliferation, and possible ways to respond, published in France, Germany and Britain. The most striking difference between these reports and the US equivalents is that none of the European reports advocated national missile defences (of Europe or the US) as the best way forward, even though they all acknowledged proliferation to be a legitimate and growing cause for concern.

The German report was published by its intelligence service in October 1999.[3] This acknowledged that a direct missile threat to the Federal Republic could emerge from the Middle East (Iran, Iraq and Syria) "in the medium to long term", and cited the export of MRBMs to such states by North Korea and the possible re-emergence of Iraq as more near term problems. The report saw potential WMD missile proliferation threats as being driven by regional security threats, but did not overtly connect these threats with European states, individually or collectively. There was thus no analysis of why one of these 'states of concern' might choose to launch a long-range WMD missile at Germany. The report was also revealing in its prescriptions for dealing with such a situation. These focused almost exclusively on arms control and export controls. Engagement, rather than missile defence, was seen as the best option for dealing with missile proliferation and its consequences.

German views on US NMD were articulated last year by the Foreign Minister Joschka Fischer, in a speech to the Bundestag.[4] He emphasised that the US ought to consult with its allies before making firm decision on deployment, and expressed concern over the possible effect of NMD on arms control and non-proliferation regimes and on the cohesion of the NATO Alliance. This unease about the implications of the US developing missile defences manifested itself not only in these public statements, but also in the ambivalent German support for the Medium Extended Air Defence System (MEADS) system over the latter half of 2000.

There also appears to be a further element in German perceptions of NMD, and of a possible EBMD based upon US technology, that has been articulated less vociferously, but may nevertheless significantly colour views of both systems. This concerns the industrial implications of engaging with the US in such activities. There appears to be great sensitivity in Germany to the fact that they, and Britain, were persuaded to give visible political support to SDI in 1986 by signing a Memorandum of Understanding on joint development of technology and the participation of their defence industries in the project. Germany regards itself as having little, if any, industrial benefits from it. The multi-million dollar contracts just did not appear, which led to accusations of political bad-faith by the US. There is clearly a determination not to see history repeat itself. This concern may link into a more general German readiness to consider co-operative activities with Russia and other states of the former USSR, as seen in its insistence on having Ukrainian design considered in the competition for the European Future Heavy Lift Aircraft.

Thus Germany is likely to be receptive to the Russian proposals to make an EBMD a joint European-Russian enterprise, incorporating both US and Russian technology, as well as cautious of any US attempt to buy the European allies off by technology sharing offers over NMD or an EBMD. This caution was noticeable in Germany's response to the Bush Administration's rather vague offers to include NATO allies in US missile defence plans. The response was conciliatory on NMD, but Schroeder did stipulate that Germany should not be "excluded from the technology and the knowledge of the technology". This was an echo of the "no technological one-way street" condition that Germany placed on the SDI deal, and reflected a concern to be treated as an equal.[5] This means knowledge-sharing by the US, and not a simple case of Germany buying technology off-the-shelf. Memories of how Washington's reluctance to share Patriot technology caused genuine problems for the MEADS programme are likely to be strong.[6]

French defence planning has undergone a "southward reorientation" to take account of WMD and missile proliferation in developing states since the Defence White Paper of 1994.[7] The French Senate Report of June 2000 accepted that long-range missile capabilities would emerge in the Middle East at some point in the future, but, like Britain, France places greater faith in the deterrent power of its nuclear weapons against small 'rogue states' than does the US. Indeed the British Parliamentary Select Committee appeared to speak for most European states in stating that "we are concerned that the US over-emphasises the capability component of the threat equation, when it comes to assessing the extent of the threat it faces, and attaches too little importance to intention", and argued that the negative impact of NMD on the ABM Treaty and arms control would outweigh any tangible defence benefits. Its recommendation was that Britain should "encourage the USA to seek other ways of reducing the threat it perceives".

France and Britain occupy a unique position in relation to the need for missile defences, in that they are nuclear-weapon states (NWS), and thus have their own means of responding in kind to WMD missile threats. They are also the only European members of NATO with significant capabilities to project military power outside the NATO area. While for many European states missile defence is associated solely with defence of the homeland, these states also have the requirement to provide TMD for forces abroad.

However, the British and French faith in deterrence is not unqualified. A recent report by the British Ministry of Defence argued that deterrence at the sub-strategic level was in need of development, in light of ballistic missile proliferation and the possibility that "some states may not respond to deterrence as we might expect". The latter concern was focused on instances of irrational or unattributable attacks, but the threat under discussion was to force deployments overseas, not to the UK homeland.[8] This is particularly the case when facing militarily inferior forces, where a hostile government may initiate the use of chemical and/or biological weapons in asymmetric response.[9] This appears to be as far as official thinking is prepared to go.

The southern tier members, Greece, Italy and Turkey, who are closest to the 'states of concern' have so far made little or no public comment on

NMD or the possibility of EBMD, which in itself is a revealing fact. However, some information about likely responses can be gleaned from their academic and NGO communities.

Greek threat perception usually focuses on Turkey and instability in the Balkans, and it is only relatively recently that WMD and missile proliferation have begun to feature in Defence Ministry White Papers. Given the Greek acquisition of Russian S-300 TMD systems (which have the capability to intercept high-altitude cruise and short-range ballistic missiles) it can be anticipated that the reaction to a NATO TMD system would be sympathetic, especially if it made use of its Russian-supplied TMD systems. But it is also likely that any proposal to develop an area defence system would raise Greek concerns over its good relations with the Arab states in the Eastern Mediterranean, as some of its drivers will almost certainly be seen to originate in this area.

Italy is still the only NATO member to have come under direct ballistic missile attack in the post-war era. Although this attack was on a very small scale (a couple of Libyan missiles unsuccessfully aimed at Lampedusa in 1986), it possessed all the characteristics of current US concerns and NMD rationales: a limited strike with unsophisticated missiles, upon an ally of the United States, from an archetypal 'rogue state'. Yet the Italian response was to mobilise diplomatic and political initiatives against Libya, not military ones, and Italy has shown no overwhelming interest in acquiring missile defence technology beyond participating in the MEADS programme, even though it will be among the first European NATO members to become vulnerable to intermediate-range missiles such as the Iranian Shahab. Contrast this with the US response to the Taepodong test of 1998, and the likely reaction in Washington if the DPRK were to launch a missile in the direction of, say, the Aleutian Islands base in the Pacific. To reiterate an earlier general point, Italy clearly prefers to deal with such threats primarily through political, rather than military means.

Turkey's prime concerns over missile defences focus on an overwhelming desire to preserve the existing non-proliferation regimes, the US-Russian arms control regime and in particular the INF Treaty, and the cohesion of NATO. All of these will, in the Turkish perspective, be jeopardised by the US NMD, and, by implication, any EBMD linked to it. In the first place, Russia and China are perceived as likely to withdraw their support for non-proliferation regimes if NMD is deployed (see below), and that is likely to benefit the 'states of concern', most of whom are on Turkey's strategic periphery. Second, if the ABM Treaty is abrogated, Russia has threatened to withdraw from the INF Treaty. The implementation of this threat is seen as having serious implications for Turkey, as it could generate new missile threats to its north and east from Russia itself; from the east from Russian missiles stationed in the Central Asian Republics, and from the south if this led to Russia abandoning its MTCR commitments and selling such systems to states in these areas. Third, the emergence of different strategic postures within NATO (i.e. with the United States deploying missile defences but the European states not doing so), is seen as likely to have a corrosive effect upon Alliance cohesion, which is again to Turkey's detriment.

Turkey, in common with other NATO members, has not publicly discussed the possibility of an EBMD, though it regards itself as currently under threat from the WMD that might be delivered by short-range missiles based in states to its south. Uniquely among NATO members, Turkey has to practice central, rather than extended, deterrence in its threat assessment of missile capabilities. Currently, Turkey uses its land-air forces and the threat of invasion as a deterrent against missile attack. It therefore has an active, if at the moment largely theoretical, interest in TMD systems to combat missile capabilities that might threaten the operation of its land forces. In other words, its geostrategic concerns are different to those of other NATO members, but its missile defence priorities are fundamentally similar: missile defences are only really required to defend military forces, not national territory.

However, as the current threat appears to be from biological and chemical weapon capabilities carried on air-breathing systems, its priority need seems to be for an enhanced air-defence system, although if its fears prove well founded, its interest in a TMD system, either independent of, or integrated into, an EBMD system is likely to grow. In addition, an abrogated INF Treaty would offer Turkey and other European states additional incentives to consider such a system. Indeed, such an event, while generating no new security concerns in the US, would certainly do so in Europe. Thus a US abrogation of the ABM Treaty, leading to a Russian withdrawal from the INF Treaty could have the effect of forcing European NATO states such as Turkey to consider an EBMD – or to come to an independent accommodation on such matters with Russia.

Turkey's interest in a TMD system which would have a national defence capability points to the possibility that different perceptions of vulnerability could lead specific states to favour different strategies for dealing with such threats. Consequently, a mixture of deterrence and military counter-proliferation strategies may be favoured in one region of the NATO area, and of deterrence and political non-proliferation policies in another.[10] Berndt Kubbig has characterised this dichotomy as a technology-first approach versus a diplomacy-first one.[11] This suggests that unless the Europeans themselves can agree on a common strategy to handle future missile proliferation, some states in NATO Europe may find themselves de-coupled from their European neighbours. Although an EBMD that only covered part of the European NATO area (say, the southern tier) may be technically feasible, its political consequences may be extremely divisive, especially if the reluctance of states to participate arises from differences over strategies to deal with the threat, and willingness to invest resources in a

military response to it. The above discussion, when linked with additional issues such as the emergence of European Security and Defence Identity and the Rapid Reaction Force, suggest that it is by no means a foregone conclusion that all the European NATO states, and more particularly all the EU states, would be prepared to follow a US lead over missile defence.

Collective Assessments and Responses to Threats

Arguments on the nature of the threat are central to differences between the US and the Europeans over missile defences. Hubert Vedrine, the French Foreign Minister, remarked in May 2000 that he did not see the missile threat as "dire enough" to warrant deploying missile defences, and this appears to be a widely-held view among European states. These doubts have been accompanied by scepticism that the US will become vulnerable to ICBMs from 'rogue states' in the way predicted by the Rumsfeld Commission. European members of NATO and the US thus exhibit visible differences over their perceptions of the threats arising from missile proliferation. One facet of this was highlighted in a report by the Atlantic Council of the United States, which stated that: "the most pervasive differences in threat perception across the Atlantic derive from a different weighting of technological capabilities as opposed to political intentions".[12] For the possession of a capability does not in itself constitute a security threat: that is derived from perceptions of the political relationships between a 'state of concern' and others.

This greater emphasis by the European allies of the US on political intent in making threat assessments helps to explain why the US encountered such difficulties in generating significant allied support for its own policy of acquiring an NMD, even after it had made a case for ICBM capabilities in 'rogue states' being closer to deployment than had been initially thought. Another reason for differences in threat perceptions is that, as Karp has pointed out, evaluating missile capabilities is not an exact science. "Even seemingly specific characteristics like maximum thrust, payload, accuracy, and reliability ultimately are not mathematical statements of fact but of general parameters ... In lieu of numerous and carefully-monitored tests or war-time experience, there can be no clear answers, only interpretations".[13] One consequence of this difference is that the development of a long-range missile capability by states on the periphery of NATO Europe seems unlikely in itself to create automatically a pro-EBMD constituency within Europe. For as the US Atlantic Council reported, "until there is a real prospect of a ballistic missile threat to European countries from a state that Europeans see as potentially harbouring ill designs on them in a crisis, their inclination will be to argue that intentions are more important than capabilities and that to base policy responses too heavily on the latter risks undesirable and unnecessary strategic consequences".[14]

History also appears to indicate that, just as European states prefer to use political criteria in assessing security threats, they also display a clear preference for deploying political and diplomatic, rather than military, responses when threats are seen to exist. They have tended to view nuclear deterrence as inherently political, involving the manipulation of choices, and have placed greater faith in its continued efficacy, and that of international regimes, than the US sometimes seems to do. This difference was highlighted in a 1999 North Atlantic Assembly report which argued that: "it is not clear why deterrence, which proved so effective at deterring the Soviet Union, is not applicable to lesser powers whose own capability to strike the United States is in doubt and who would not survive a retaliatory attack by the United States".[15]

European states thus appear to favour qualitatively different methods to the US when both defining and responding to security threats, as a consequence perhaps of both their historical experiences and different geographical positions. Moreover, the latter suggests that, even if what they judged to be an agreed missile threat to Europe, involving both capabilities and hostile intent, were to emerge, it would not automatically generate strong support for an EBMD, and thus enable the necessary political will to be mobilised to push through such a programme. One conclusion to be drawn, therefore, is that neither perceptions of the existing WMD threat to European states from 'states of concern', nor the changes in that threat forecast in the 1999 NIE, are sufficient to generate an effective pro-EBMD constituency in the Alliance. For this to happen there would have to be a fairly comprehensive change in both the strategic and political circumstances of the European states. And even if the current vulnerability to Russian missile capabilities were to be extended to other states, the greater European emphasis on intentions dictates that it is political judgements that would have the most decisive influence over their EBMD policy, rather than concerns over the existence of technical capabilities.

The Consequences of US Policy

A US decision to deploy a limited NMD system appears to be the event most likely to change the way Europeans think about missile defence. It would leave the US protected and its European allies (far closer to the Middle Eastern 'states of concern') vulnerable. If the arguments of some US advocates of NMD are applicable, this may generate fears that the sort of terror attacks that the US is seeking to combat may be deflected onto European states. In other words, a 'state of concern' might force restraint on the part of the US, as well as limiting its basing options, by threatening one of its unprotected NATO allies. Thus, even if the European states feel that there is no threat to them at the moment from 'states of concern', the NMD activities of the US might change those circumstances.[16]

At the moment, however, these issues are largely theoretical, as the US does not have a workable NMD, either in test or in deployment. Both boost phase and mid-course intercept concepts based on conventional kill mechanisms remain unproven. However the THAAD system, after some difficult times, is now at the advanced development stage, and could be deployed as early as 2007, though doubts remain about its credibility.[17] Despite this, many Europeans will be tempted to draw parallels with the experience of SDI in the 1980s, which has retrospectively been seen as driven less by creditable estimates of likely technological effectiveness than by dollars, arms control scepticism, and wishful thinking. There seems to be little evidence to suggest that the past will not repeat itself, with US disillusion with continued problems in developing NMD being followed by a return to arms control.[18]

Deployment of NMD by the US may thus be the single most influential factor in creating a pro-EBMD constituency in NATO — though it might also generate major political schisms within the Alliance and concerns about its future cohesion. For the principle objection to NMD, and possibly also EBMD, is not primarily that missile defence is less effective than political solutions as a way of dealing with missile proliferation. It is more that its effects elsewhere, principally the changes it may induce in Russian policy towards both Europe and potential proliferators on the European periphery, may make the cure worse than the disease. Jacques Chirac highlighted this when he argued that NMD represented an "invitation to proliferation", in that it would stimulate vertical proliferation in Russia and China, and horizontal proliferation by encouraging them to engage in unconstrained missile exports.[19]

If these effects could be neutralised, negated or do not materialise, Europeans may be more inclined to think positively about NMD. There are already indications that this is taking place. Despite continuing scepticism about NMD's rationale and feasibility — one French official recently described it as "a virtual response to a virtual threat" — the Bush Administration's single-minded commitment to deployment has produced a subtle shift in the European position.[20] The argument that NMD might decouple the US from Europe has been quietly dropped: as one German official put it, "responsible Europeans have largely accepted the US point that some security against missiles will make Washington more reliable in stepping up to a crisis".[21] Moreover, during the recent tour of Europe by US officials hoping to marshal support for NMD, a NATO official remarked that "The challenge for the Europeans will be to turn the unappetizing inevitability of missile defence into an appetizing opportunity".[22] The "unappetizing inevitability" must be made acceptably stabilising by ensuring that the current dual-track strategy of deterrence and arms control can incorporate a third dimension of missile defences. The "appetizing opportunity" is twofold. Firstly, the NATO interest in TMD and the new Rapid Reaction Force have exposed Europeans states to possible dangers to their out-of-area forces and new ways to protect them. There are already indications that the RRF has accelerated European interest in TMD.[23] Secondly, the industrial spin-off benefits of NMD are potentially lucrative: British Aerospace and the French-German-Spanish consortium EADS are reportedly negotiating to participate.

However, getting the allies to acquiesce in US NMD and its consequences is one thing, but persuading them to want their own missile defence may be another thing altogether, given their preference for other strategies. However, this is a question of emphasis: Europeans are not axiomatically opposed to missile defence. US deployment may, at worst, generate the sort of threats that European states currently regard as overstated; at best, it may mean a seismic shift in strategic posture which they may feel compelled to keep up with. Either way, US deployment of NMD is likely to exert more profound influence over an EBMD constituency than, say, an IRBM deployment by Iran.

PART TWO
SYSTEM ARCHITECTURE AND OTHER TECHNICAL ISSUES

In this section, we take as read a generalised will to provide a missile defence for Europe at some future time, and thus assume that the first question — whether there is a threat — has been answered in the affirmative. The preceding section makes clear that a very particular set of conditions would need to be met for this to happen, and that it might be a question of whether there is a need for a system to match the deployment by the US, as well as, or even rather than, a threat. Whatever the motivating factors behind a decision that EBMD might, in principle, be desirable, European states will be confronted with the next two criteria on the list: is EBMD technologically feasible, and is it cost-effective? Whilst the threat criterion is in essence about perception, these two criteria are essentially practical questions.

Having made a decision in principle, prospective members would need to make some more detailed decisions about precise requirements. For European states, the line between TMD and NMD is blurred, and they may well endorse Donald Rumsfeld's recent remark that it is more accurate to talk of missile defence as a generic term, rather than make distinctions between 'national missile defence' and 'theatre missile defence'. This section begins by highlighting the decisions about requirements that would be faced, and then explores the technological options that would be available once those requirements had been decided upon. It then evaluates how European states might best deploy the technology, and explores how they might have a role in its development and transfer. The section concludes by looking at the unique — and daunting — command and control challenges that would be attendant on EBMD's implementation, and the current debate within the Alliance over missile defence.

Defining the Requirements for EBMD

The nature of any EBMD system will depend on precisely which states are involved, what they require from such a defence, and what technology is available: in procurement parlance, the customers must state a requirement. This section focuses on the issues of membership and defence requirements. Obtaining agreement among the many states likely to be involved will be a lengthy and difficult process. The following questions, though, are likely to be of central importance.

The Defended Area

The characteristics of an EBMD system will certainly depend on the area required to be covered. Its command and control system will be complicated enough in a simple scenario (see below), but may have to cope with countries not requiring coverage, or nations which require different levels of coverage. An early question must be which countries constitute Europe? A simple answer might be those that are in NATO. This would omit certain East European states, but even within NATO, it does not follow that all members would be interested in missile defence, with the same level of coverage, and with command and control surrendered to a central organisation. States outside EBMD are unlikely to be willing to host elements such as radars or launchers, nor could they take part in command and control, and those that do not sign up need not expect to be defended by those that do. However, neither membership nor non-membership will prevent debris from interceptions falling upon European states.

Geographically and politically, a difficult issue is exemplified by France and Britain, who are likely to want to retain their independent nuclear deterrents as their principal means of dealing with 'rogue state' threats. Would France, for instance, be willing to host radar or launchers for the defence of the rest of Europe if they were not inside EBMD? Each country must ask itself the same question. Only if nations are prepared to share assets for mutual protection, rather than controlling and hosting systems for their own protection, will a cost effective EBMD be possible. Another example might be the forward siting of radar in, say, Turkey. This would provide invaluable early warning and tracking data for the rest of Europe, but might play little direct role in the defence of Turkey itself.

Moreover, if an EBMD is not to be a complete shield for the whole of Europe, its participants must make decisions about *scale* (wide area defence or fixed-point coverage), and *purpose* (protecting civilian populations or military sites). The protection of small areas (say 10km diameter) would require a much less complex and advanced defence than one designed for nation-wide territorial protection. The larger the area to be protected, the faster the interceptors need to be; the more interceptor locations will be needed; and the earlier interceptions should be attempted. This issue —

what targets does Europe wish to protect? — is the principal determinant of system requirements, timescale and cost.

The Target Array

Clearly, short-range missiles demand different defence systems to those for longer-range ones; each nation may be threatened by different missiles, and the north European nations will come under threat some years after those in the south. It will thus be essential to decide whether the system is to deal with 'rogue state' missiles only, and not those deployed by Russia or China, even if they are accidentally launched. The capabilities of 'countries of concern' are undoubtedly growing, both from indigenous developments and the proliferation of technology. For some years, their missiles will largely have short to medium ranges, carrying single warheads (no MIRVs) on top of a single or two-stage liquid propellant rocket. Many will be non-separating, although those of the NoDong variety do employ a separating warhead. In due course, solid propellant technology will become more common, giving greater mobility and higher acceleration. As ranges increase and missiles get larger it is likely that fixed launcher sites will be required. These will be more vulnerable to counter force than mobile systems, which are much more difficult to locate and attack.

What type of countermeasures these emerging missile states employ and when they might be incorporated in their systems, remain obscure, especially if they can be developed out of sight of the West's intelligence gatherers. However, to develop robust, reliable, effective countermeasures without flight-testing is likely to be beyond the current capability of the 'states of concern'. Unreliable, ineffective designs are much easier to field, yet the defender must invest an enormous effort — much larger than the aggressor — to have a chance of staying ahead in the counter-countermeasures game.

Requirements of Effectiveness

At the outset, the impossibility of a leak-proof EBMD must be recognised. In recognising it, the question becomes: just how effective should a defence be? Will nations demand high levels of effectiveness and if so, how will these levels be expressed? Minimisation of casualties is a likely political objective, but it is almost impossible to design a system on that basis, since the link between casualties on the ground, and defensive system performance is impossible to define, and thus the same applies to its likely effectiveness.

US TMD and NMD systems have been designed on the basis of a high probability of 'no leakers', side-stepping the issue of casualties and ground effects. This at least gives the designer the ability to design and test a system, but it leaves open the issue of what happens to the residue of debris from an interception, and also recognizes that occasionally a missile will leak through the defence. Europe must face this issue of the overall system effectiveness requirement from the outset. Difficult as it is to understand and explain the concepts of risk and probability, the politicians and public must not be deluded into believing in a leak-proof, zero casualty guarantee.

The Link With Other Missile Defence Systems

An effective EBMD can provide a major contribution to the defence of the US against Middle Eastern threats. Missiles from Iraq or Iran over-fly Europe on their way to the US.[24] With sufficiently fast interceptors (THAAD-like or NTW systems would not cope) and good early warning and tracking, an EBMD system may be able to intercept the ICBM in its ascent phase. Even if an interception is not achievable, defence of the US is significantly improved using tracking data from Europe; indeed, this is precisely why Fylingdales was seen to be required for NMD, and why a new X-band radar (XBR) in Europe becomes necessary, as the threat becomes more sophisticated. However, there is little prospect that a US NMD (at least the Clinton-era ground-based version) can help to defend Europe, except perhaps from North Korea; the aggressor/target geography does not work.

The Russia Question

What assurance can be given that EBMD is not and cannot be a threat to the Russian strategic rocket forces? This issue is already prominent in Russian objections to NMD. Can an EBMD be inherently limited, and seen to be so, or might it be expanded to handle hundreds of missiles, rather than just a few, simply by adding further elements (launchers, radars, software)? Outsiders find these questions impossible to answer, and insiders are unlikely to be entirely open about the system's limitations. The simple answer is that launchers and interceptors can be added until the cash runs out. The real question is whether the radars and the command and control processing and software can be enhanced in a similar manner without encountering technical limits. A conventional answer to this is that additional layers would be needed, including space-based directed energy weapons or interceptors such as the SDI-era Brilliant Pebbles. What is not in the public domain is precisely at what raid size, or threat complexity, the missile defence architecture would fail if it were enhanced simply by adding more of the same elements. There will clearly be untold political difficulties if an EBMD cannot be shown to pose no threat to Russia, especially as the 'rogue' threat increases in numbers and sophistication, forcing an EBMD to evolve from a system of TMD capabilities deployed in south-eastern states to an ICBM defence for those states further to the north and west.

Finally, the requirement needs to note what EBMD is not. It is not a defence against cruise missiles. It has no capability against terrorists or the so-called suitcase bomb. It will not necessarily defend those who don't sign up, and, to repeat two

points from the previous discussion, it is not a threat to Russia and it can never be guaranteed leak-proof.

A Shopping List for EBMD: The Options and the Candidates

This process of deciding on the requirements of EBMD is logical and systematic, but EBMD decisions are unlikely to follow the process as it has been described here. More likely, Europe will be faced with some sort of offer from the US, with the Russians making different offers in parallel. Missile defence systems — such as the modified Clinton-era NMD, or upgraded Aegis systems, or Air Borne Lasers, or THAADs and PATRIOTs or Russian S-300s — will be advertised as "on the shelf" with each nation being tempted by suppliers to pick-and-mix for its own purposes. Such an approach will be divisive, chaotic and unworkable. Ideally, the nations of Europe will attempt to agree on a collective response to such an approach, rather than engage in making separate piece-meal deals with the US and Russia, which will be strategically destabilising.

Unless entirely new weapon systems are to be developed, and such systems take at least 15 years from invention to deployment, the candidate systems for an EBMD are already in development, or can be evolved from existing systems. Whatever the Bush administration has in mind, US proposals will inevitably include either territorial shield or boost-phase intercept systems — or both.

Territorial Shield

This model of missile defence provides a barrier over potential targets rather than over a potential attacker. It has two sub-types: terminal intercept and midcourse intercept.

Terminal Intercept

This form of missile defence, which intercepts the target array as it re-enters the atmosphere, is especially useful for defence of military forces and point defence of 'missile dangerous' areas. It is considerably less effective against longer-range missiles. Options are:

- The US Army's PATRIOT PAC-3 system. This will be capable of intercepting ballistic missiles up to perhaps 1500km range, although it is best suited to those below 1000km range. It might defend a small town, an airfield, a port or a military site. The longer the range of the offensive missile, the smaller the defended area and the less effective PAC-3 becomes. Beyond a specific range it will have no performance at all. However, this not a unique PATRIOT feature: no system can deal with all threats.
- The US Navy's Aegis ships with the Navy Area Defense (NAD), based on the Standard missile. This does a similar job to PAC3, but at sea, or on-shore when the ship is close enough.
- MEADS is a co-operative venture led by the US with Italy and originally Germany. It is a mobile system for battlefield use aimed at many different types of air target, including short-range ballistic missiles. Its performance against ballistic missiles will be similar to Patriot, indeed in its first version will use the PAC-3 missile.
- The US Army's Theater High Altitude Area Defense system (THAAD). This is a totally new development based on some SDI technologies. The hit-to-kill missile is faster than PAC-3, works best at the edge of, or outside of, the atmosphere and, if it works as advertised, will defend areas up to about 100km in diameter. Its performance against missiles beyond 3500km range is not known, but is likely to fall off rapidly (in terms of area defended and probability of kill). Land-based systems such as THAAD, PAC-3 or the Russian systems must position their launchers relatively close to the defended area, which might be quite small. THAAD's coverage diminishes with the range of incoming missiles, becoming more of a point defence at, say, 3000 to 4000 km, although this feature might be partly overcome by using radars located well forward.
- The US Navy's Navy Theatre Wide (NTW) system, also based on Aegis ships, will employ an exo-atmospheric hit-to-kill vehicle (EKV) on top of a modified (faster) Standard missile. Further developments, with a yet larger, faster booster, are claimed to approach the capabilities envisaged for the Clinton-era NMD. Its crucial capabilities are the enhanced acceleration and velocity of the interceptor, and the capabilities of the ship borne radar. However, a new radar and a new missile would be needed to deal with the longer-range missiles (4000-6000km) that ultimately will threaten the northern countries of Europe.

Midcourse Intercept

This was the system being pursued by the Clinton Administration during its final term in office. It consisted of: space based infra-red (IR) launch detection satellites; early warning radars (including at Thule, Greenland and Fylingdales, United Kingdom); new X-band radars; interceptors carrying exo-atmospheric kill vehicles (EKVs) with IR and visible-band sensors; and a centralised command and control system at Colorado Springs. Of all the systems discussed so far, it is the only one that can counter ICBM-range missiles (i.e. greater than 5000km). A Clinton-era NMD-like system to cover Europe would be relatively insensitive to the location of the interceptors, but would benefit from having forward-based radars to develop tracking and discrimination as early in the missile's trajectory as possible. Simple facts such as the earth's curvature and lack of time prevent NMD-like interceptors from dealing with short-range missiles targeted thousands of kilometres forward of the interceptor launchers. Hence the need for other types of missile defence system to defend the southern and south-eastern regions of Europe.

Other developed systems, such as the Israeli ARROW, may find application in certain niche scenarios that are similar to that facing Israel. It is

a movable, if not mobile, system employing a large interceptor using a warhead for lethality; it is not a hit-to-kill system. Advice and some technology has been provided by the US. Its capability is against short to medium range, relatively simple ballistic missiles. Its discrimination capability is not publicly known.

For early warning, tracking and discrimination, an optimum system employs multiple wavebands, with infra-red and radar as a minimum. IR satellites give first warning and a crude trajectory prediction. Forward-based UHF radar gives enhanced early warning, tracking and some discrimination. Higher frequency radars (X-band in the US systems) provide discrimination and refined tracking data. If all sensors can be netted satisfactorily, it might be said that, for EBMD or for any other missile defence system, there cannot be too many sensors. The C centre can be anywhere but will need a complex network of secure, protected communications links to feed in all the sensor data, and similarly secure links out to all interceptor sites.

The territorial shield model of EBMD would have to cover a wide geographical area with radically different proximities to potential threats. The key to its effectiveness would be where the sensors were placed: interceptors travel at 8km per second and are fast enough to intercept from a long distance. A long-range system, utilising Upgraded Early Warning Radar and X-Band Radar (UEWR/XBR) and satellite reconnaissance could acquire and track missiles from the Middle East within five minutes of launch if placed in Southern Italy. This system would work against longer-range missiles but, of necessity, a TMD terminal-intercept system would be required to defend against short-range ones. These lower-tier defences might include the PAC-3 system to defend 'point' military targets against SCUD missiles, and upper-tier defences such as THAAD to defend larger 'area' targets against NoDong-type missiles.

Upper tier defences are among the most advanced missile defence systems, with THAAD scheduled for deployment in 2007. It is usually associated with TMD, but this is partly due to the fact that it is a US system, and for the United States anything short of ICBM defence qualifies as TMD. It is therefore possible that such a system might be deployable as a cover for European territory, and this possibility has already received attention.[25] To achieve this would require a very large defended area for each interceptor (i.e. a large 'footprint') if the defence is to be viable. An autonomous THAAD system (i.e. one in which each interceptor battery has its own radar) can only defend a 120km circle against a single incoming warhead, and would thus be effective only as a point defence rather than an area one. The footprint of a THAAD system also shrinks markedly in the event of a multiple warhead attack.[26] However, current NATO plans for upper and lower tier TMD, for example, could reportedly defend some cities near conflict zones, regions such as the Turkish-Iraqi border, and coastal areas such as that of Italy.[27]

Coupled with THAAD, NTW could provide extensive cover against missiles from the Middle East. Such a system might also be more palatable to Russia and China, as its effectiveness against sophisticated ICBMs would be limited and it could not get sufficiently close to Russian launch sites to threaten Russian missiles. NTW might also be able to provide a boost-phase intercept capability, particularly against long-range missiles with relatively lengthy boost time.[28] However, the problems of suitable waters for ship placement, and of defending them, make intercepting Middle Eastern missiles problematic, and so the possibility of airborne boost-phase intercept may be worth pursuing for EBMD.[29]

Sea-based EBMD

The ship-borne, sea-based elements can operate wherever there is a sea with ocean access that is readily defendable. Clearly the ships themselves become targets for the aggressor, and their defence will become a significant new mission, since the ships may be operating in areas they might not otherwise have inhabited. Studies will need to be undertaken to decide best locations in a range of scenarios depending on the relative geography of aggressor and target. Ship-based missile defences could operate as boost phase, mid-course and terminal intercept systems. For instance, it is conceivable to defend Britain from missiles fired from Libya by using ships in the Mediterranean and/or in the English Channel.

Advocates of naval missile defence may now have influence in the Bush administration. The inherent mobility of this form of missile defence can, in many circumstances, position the interceptors so that ballistic missiles can be intercepted in their boost phase. The Eastern Mediterranean is one such location. Finding suitable areas of defendable sea to deal with all ballistic missile threats to the whole of Europe may not be so easy, however. One feature that must be present for the whole of Europe to be covered is a much faster interceptor than is currently being developed. New radars will also be needed to cope with increased distances and with the discrimination task. In the long run, an entirely new class of ship may be needed. These developments will not be inexpensive or short-term.

However, sea-based missile defence, if it can be made to work, offers important advantages such as the ability to move it to the current hot spot, and the possibility of early ascent phase attack. Sea-based missile defence potentially offers an invaluable layer; mid-course and descent-phase systems can deal with those missiles not successfully intercepted by the ship.

Boost Phase Intercept

Boost phase technology is currently less developed than other types of missile defence, but some types are emerging. The US Air Force's Air Borne Laser (ABL), currently the leading technology, is a chemical laser carried on a 747 aircraft. This is designed to destroy rockets in the boost phase at ranges up to about 300km. Unless the defender has

air superiority within the aggressor's air space, this distance limits the use of ABL against many launch sites. In times of tension, the ABL has to be airborne permanently, and provided with fighter protection.

Other boost-phase possibilities have been studied. These employ lasers or airborne interceptors on aircraft or unmanned air vehicles (UAVs). The interceptor solutions require large missiles with highly energetic propellants since the major challenge is the so-called time-line: getting to the offensive missile before its engines burn out. Terminal guidance is also difficult. UAVs potentially can loiter close to launch areas, but they are still vulnerable to air defence systems. None of these systems is as advanced in development as the other options discussed above.

As a general rule of thumb, the intercept systems for a boost phase defence would have to be based within a 600-1000km radius of the potential launch site in order to be effective. The advantages of boost phase are its ability to defend against attacks from specific states, and its radically reduced susceptibility to countermeasures. Thus the technological problems that generate doubts about the very feasibility of the territorial shield model are less critical for boost phase. According to an authoritative report, the intercept technology for a boost phase system could soon be available, but the required sensor technology would take time to develop.[30] Moreover, the discriminate nature of a boost phase system means that it does not hold as much potential for degrading the deterrent capabilities of Russia and China as the territorial shield system. This however is also the source of its most obvious problems. A boost phase system means making very explicit political statements about enemies, and effectively ring-fencing these states with sensor and/or interceptor apparatus. This is something that will not necessarily be easy to create consensus about, especially in an organisation as geographically diverse as NATO.

This highlights some of the key differences between territorial shield and boost phase systems in the European context. In the case of the former the ground-based architecture is all in the territory of the defended NATO states. In the latter, the co-operation of neighbouring countries such as Russia would be indispensable, and one critic has pointed out that "launch of boost phase missile defense interceptors based in Russia could be vetoed by them, operationally".[31] Therefore, this model of EBMD would depend on key non-NATO countries sharing the same threat perceptions regarding Middle Eastern states as Alliance members.

Architecture Options for Europe

The most likely architecture for an EBMD would employ components from the US land-based Clinton-era NMD, including variants of its elements (for instance, a less energetic, slower interceptor). This would not however provide cover for the south-eastern countries, which would require less energetic, shorter range TMD systems such as THAAD or NTW. In the extreme border regions of south-east Europe systems such as PAC-3 would be needed for fixed points; given that area coverage at short range is extremely difficult. Ironically, it is easier to provide wide area coverage at long range, using mid-course interceptors. For instance, for the total area coverage of Turkey, a large number of THAAD interceptor sites would be needed.

Although an alliance decision to deploy an EBMD could be taken in isolation from a decision on its architecture, this would probably need to be explored before a decision in principle could be achieved. The 1999 NIE forecast suggests that any area defence of NATO Europe would need to be layered as it would have to be designed to defend against missiles with different ranges, and thus flight characteristics.[32] Moreover, the political and strategic questions raised by EBMD are inescapably linked to the technological architecture that would be used in the system.

A territorial shield model of EBMD could operate along the lines pursued by the Uinted States: a network of ground-based interceptors (GBIs) guided by ground-based radars and possibly also a space-based infrared sensor (SBIRS) system, together with TMD-derived systems for point defence, especially in southern tier states. Such a system might be designed to defend against an attack from 5-20 single-warhead missiles with relatively unsophisticated countermeasures. The defining feature of this mode of EBMD would be that the defensive activities would take place over the territory of the states behind the shield, rather than over that of a potential attacker. However, the only way to evaluate against whom it is directed would lie in the thickness of the shield. For example, the US has been at pains to stress that its planned territorial shield NMD will not be thick enough to seriously threaten the Russian nuclear arsenal, and presumably it would be prepared to formalise this in a future arms control agreement, as would the Europeans if they deployed an EBMD.

By contrast with the territorial shield model, a boost-phase intercept system puts the defensive lid over the attacking state rather than the defended, and can be used to target specific states in a way that territorial shield cannot. Thus the defence has to go to the attacker, and this demands a military reach that would not be required for territorial shield. The system can be based on sea/ground-based detection and intercept capabilities, and possibly a space-based element as well. This was the basic idea behind the Global Protection Against Limited Strikes (GPALS) scheme discussed between Russia and the US in the early 1990s.

The development time needed to deploy either of these systems is very difficult to predict. In the US the territorial shield model has suffered serious testing problems, and boost phase has been largely neglected in favour of territorial shield, although it is gaining a groundswell of academic and official support.[33] Moreover, the Bush Administration has pledged itself to a complete review of the NMD programme, with a commitment to a much more robust system, and the new National Security Advisor Condoleeza Rice has strongly criticised the

Clinton NMD plan, claiming, among other things, that it decoupled the US from its allies. For technological and political reasons, the initial US deployment date for an NMD of 2005 will not be met, and 2010 seems a more likely date, which suggests that deployment of a NATO-Europe wide system would be unlikely to occur before 2015. Thus procurement of this system, if it occurred at all, would probably coincide with decisions on the future equipment for the French and UK nuclear deterrent forces, as well as those in the US. The interaction between these two sets of decisions could have a significant influence upon both.

A further factor influencing deployment and decision times is that the Middle East 'states of concern', where the principal threats to Europe are likely to originate, seem likely to deploy long-range missiles later than the DPRK, the principal perceived threat to the US. According to the 1999 NIE, the Middle Eastern states will not develop long-range missile capability for ten to fifteen years, reinforcing 2015 or later as a likely deployment date for a full EBMD. This would, among other things, offer more time for developing newer defence technologies.

One aspect of the choice between system architectures is that boost phase and territorial shield would have radically different political and strategic implications. Boost phase puts a 'lid' over a potentially hostile state and in so doing has a different impact on regional security dynamics to territorial shield. For example, a boost phase system that targeted Iran would seriously compromise that state's capabilities against regional enemies, as well as its capabilities against NATO members. This would focus attention on the conditions under which the defence would be activated. Would this be only when NATO members were actively threatened? Or would it also be activated in the event of missile attack on another state such as Israel or Iran?

A boost phase intercept system, however attractive technically, would therefore create political and military consequences by its very existence: those states or alliances which deploy it would acquire a substantial influence over regional conflict dynamics, whether they intended this or not. For a close-in intercept capability does bestow the capability to shoot down missiles wherever they are headed and thus the capability to affect regional conflicts without deployment of ground forces.

A further key question posed by a boost-phase intercept system is who decides which states are to be treated in this way, and how will the decision be made? More specifically, would a decision to move the elements of the system to sufficiently close range need to be made by consensus among all the NATO allies? The geographical, political and strategic diversity of NATO means that it would be a highly controversial exercise outside of an explicitly-delivered threat of missile attack. How decisions were to be taken on when and how to activate the shield would thus be critical. One possible problem might be that no explicit threats of missile attack would be received; another that waiting until such threats were issued would give incentives for a first strike. The counter-argument of course is that activating the defence would be a provocative act in itself.

Procurement and Development of EBMD: Constraints and Opportunites

Technology Transfer Constraints

The ABM Treaty currently constrains the assistance the European NATO states could receive from either the United States or Russia in an EBMD. However, since it seems inevitable that the development of an EBMD system will be preceded by a US deployment, the relevant issues becomes how, if at all, the US and Russia amend the Treaty to permit this. Thus the issue will not be whether an EBMD will be compliant with the existing ABM Treaty, but under what conditions transfers of relevant technology will be permissible under any amended Treaty or successor arrangement.

Currently, Article 9 expressly states that "each party undertakes not to transfer to other states, and not to deploy outside its own territory, ABM systems or their components". This would seem to rule out both an EBMD system designed to provide a European shield against long-range missiles using imported US or Russian technology, and any co-operative venture along the lines of GPALS. The operative part of Article 9 is "ABM systems", with ABM being defined as strategic missile defence. It is difficult to foresee how the ABM Treaty might eventually be amended or re-interpreted by the US and Russia, but the 1997 Demarcation Agreement specified that a TMD with interceptor speed of up to 3km/sec (e.g. THAAD) was permissible, whilst TMD with interceptor speeds over that limit (e.g. NTW) was also permissible provided it did not "threaten" the strategic deterrents of Russia or the US. This was clearly intended to allow the US to proceed with the development of upper-tier systems, despite THAAD's potential capability (albeit limited) against strategic missiles.[34]

There are broad and narrow interpretations of how this impacts upon whether missile defence technology can be transferred to the European NATO states. A broad interpretation would state that anything within the technical limits of the Demarcation Agreement is permitted, including THAAD and similar TMD systems. A narrow interpretation would state that any system having national defence purposes is a strategic system and therefore non-compliant with the ABM Treaty. Thus, a point defence of some cities, forces, and some border areas might be permissible as a nucleus of EBMD. A more comprehensive system, but one still based on upper-tier technology such as THAAD and NTW, would be on the boundary between compliance and non-compliance, and might well be seen as the thin end of a long wedge by Russia and China. A comprehensive EBMD which provided cover from long-range missile would, by contrast, contradict the letter and the spirit of the ABM Treaty.

However, the idea behind the ABM Treaty when it was negotiated in 1972 was that it should maintain the vulnerability of both major nuclear powers to nuclear retaliation. While it could be argued that this deterrence logic also applies to France and Britain as they too are NWS, it does not apply to the non-nuclear US allies in Europe or to Japan (especially if all US nuclear weapons were to be removed from European bases). As non-nuclear weapon states, there seems no reason why they should be barred from acquiring conventional technology for use in an ABM role. Configuring EBMD so that it did not defend either France and Britain, and thus threaten the Russian deterrent capabilities against these NWS might pose problems for an EBMD, although, given their low numbers, it is difficult to make the case that the nuclear arsenals of France and Britain have the capability to carry out a nuclear-disarming first-strike on Russia. However the solution to this, if one was needed, would be for the European NATO members to agree limits to their missile defence capabilities by becoming parties to any amended ABM Treaty, or through bilateral/trilateral agreements with Russia.

Europe and the US

Comments from President Bush and his staff on their May 2001 world tour to explain US missile defence ideas suggest that a layered total system is being contemplated, and that co-operation is being considered. The proposals are likely to make use of all the developments currently funded in the US, together with additional emphasis on the sea-based concept. The layers are likely to include the ABL (in those scenarios where it can operate with least survival risk to itself); sea-based systems for ascent and mid-course interceptions using ship locations that similarly can be defended; land-based THAAD, PAC-3, and S-300 systems largely in the south-east regions for defence of population centres and military installations; and a Clinton-type NMD system for the more northerly and westerly regions.

Europe's politicians and industries will insist on substantial work being undertaken by European contractors, in spite of the fact that all the intellectual and inventive effort and the technical developments are taking place in the US. Whereas in Europe there is basic knowledge, some relevant expertise and industrial capability, the fact is that European industry simply has not worked on these technologies in earnest. The technology gap on missile defence is as wide as in any area of defence technology, although there are pockets of activity. The French, for example, are planning to upgrade their SAMP-T (ASTER/ARABEL) air defence system to cope with short range ballistic missiles. However, this system will not even defend France, let alone Europe; it is intended for the defence of deployed forces. Germany and Italy retain a finger hold on some relevant technologies through MEADS, again a system for theatre use. Britain hopes to keep radar expertise alive through its advanced digital adaptive beam forming phased array work (MESAR and SAMPSON), and involvement with the United States on early warning radar.

This is small beer indeed when set beside the billions of dollars already invested by the US, both in technology and in system developments. In the unlikely event that quite new developments are agreed to be needed for EBMD, and that US systems are not suitable for it, it is unlikely that European industry, without US help, could develop an EBMD system in less than 20 years. Thus it would appear that the only realistic role for the European defence industry is to manufacture under license.

However, there are two areas where Europe might reasonably insist on an integral role. One is the command and control system, including the use of all available sensors, their networking, their communications links and the development of a Battle Management, Command, Control and Communications centre (BMC) for EBMD. Europe is unlikely to be content with the command and control for EBMD being located in the US. One approach might be for the task to be handed to NATO, but on the day of the attack each member must previously have agreed to allow such a centralised system to make the decision on how best to defend it. This raises the issue of command and control, which is arguably the most formidable technical challenge for EBMD and is looked at in more detail below. Another possibility for an integral European role is the development of a European sea-based system, based on existing air defence ship developments such as the UK's Type 45 destroyers, Spain's Aegis buy from the US, or the Netherlands Air Defence Frigate. These might be modified to take the appropriately evolved Standard Missile.

An age-old problem will probably arise in any transfer of advanced technology from the US. Historically, the US has resisted transferring its most sensitive technology. If EBMD is to become a realistic option, it is highly likely that the European states will insist that any transferred technology be shared rather than 'black-boxed'. In that event, the US would have to relax its technology transfer rules significantly.

Europe and Russia

One strength of Russian defence technology is recognised to be its ground based air defences. Not only does Russia possess advanced systems in the S-300 family, but it also deploys the world's only ABM system to defend Moscow, albeit using nuclear warheads which do not require accurate guidance. However, it is widely understood that Russia is less advanced with hit-to-kill technology than the US, and therefore still relies largely on bigger interceptors carrying explosive warheads. Many of its systems are mobile, and these form the basis of Russia's recent proposal to NATO for co-operation on missile defence. Precisely how the Russians foresee such co-operation working is unclear, but the proposals must clearly be folded into any thinking about EBMD. These systems might, for instance, be used in the south-eastern regions of Europe instead of THAAD, PAC-3 and NAD.

Early Warning

The most promising area for co-operation initially is the sharing of timely, all-source, early warning data of missile launches. A start has been made, both in NATO and between the US and Russia, the latter being essentially a confidence building step. Many more steps, similarly bold, will be needed before a truly co-operative missile defence evolves, but the sharing of early warning data would appear to be the least difficult (technically), the least risky (politically) and the least costly. NATO should move in this direction at once. The challenge is to the US to be willing to release more of what hitherto has been "classified" data, notably from its IR launch detection satellites (DSP and SBIRS).

Simulation and Testing

Like US missile defence, an EBMD system can never practically be tested in anything approaching realistic trial conditions. TMD test conditions can come closer, but there will always be real-world factors that never can be included. The principal difficulty is the lack of suitable test ranges, and the impossibility of offering targets precisely like those of the aggressor in tests.

Moreover, post-intercept problems of debris shortfall and intercept altitude can be almost as intractable as the problems of 'hitting a bullet with a bullet'. Terminal phase intercept does tend to result in debris from the intercept, including the warhead itself, falling from the atmosphere, and one study has concluded that "it is a relatively simple task to wire up a nuclear warhead to explode the moment it is intercepted".[35] The BMDO have attributed this capability, known as 'salvage fusing' to emergent missile states in the developing world.[36] The consequences of both the associated heatflash and electromagnetic pulse for the ground below the intercept would clearly be severe, and raise the issue of the acceptable altitude limits of ballistic missile intercept. For this reason, states may be highly reluctant to allow interceptor missiles to be based on or near their soil.[37] The debris from the use of such interceptions will fall to ground, and if the warhead has not been neutralised, agent or nuclear material may be dispersed to unintended areas.

Two different scenarios illustrate this point. First, a successful hit-to-kill interception of a warhead just inside the atmosphere on a ballistic trajectory. Where does the debris fall to earth? And what are the consequences of a nuclear or biological warhead descending to the ground? Second, the interceptor misses. Assuming there is no follow-up intercept attempt, the ballistic missile warhead may hit its target and may cause the intended (or unintended) damage; the interceptor missile will proceed on a ballistic trajectory and, depending on its velocity and direction, will also hit the ground, perhaps causing damage to a non-participant, although probably not, depending on the population density in the area.

These problems are less of an issue for the US, which has huge expanses of ocean on either side, but are a grave problem for EBMD, where debris is highly likely to come down on land. These issues are, so to speak, the fall-out problems of EBMD. None can be answered yet with any confidence, and nor is it likely that we will know very much more when the systems come into service. These are issues which have not been addressed, although complex and costly testing and computer modelling may yield some of the answers.

In the US one part of the answer is to test, as far as possible, "at test points near the extremes of the envelope", although even this is all but impossible for US NMD under current ABM Treaty restrictions. The second part of the answer is to use simulation, principally with "hardware-in-the-loop" in an attempt to replicate all conceivable conditions the system might encounter. Europe would need to follow a similar path, but the test range restriction is a significant one. Potentially, this is another opportunity to involve Russia, where geography and past experience may mean that co-operative testing on ranges in the former Soviet Union can be more realistic. The US Pacific Test Ranges or France's ocean ranges, and the White Sands Missile Range for shorter-range systems would also have to be used. Australia — already showing support to NMD — might also be able to help here, as it did in the UK case in the 1950s and 60s.

It is probable that Europe will be buying technology that has already been tested by Russia or the US. It will be important for evidence to be provided that any system actually works in scenarios and conditions defined by Europe. Such evidence will be hard to produce, but the customer will need to know that the defence is "fit for purpose". Computers and software offer the best opportunity for Europe to come together and to think through EBMD. With no risk and relatively little cost, an EBMD Simulation Facility might be established, with its doors open to all interested, threatened countries, to undertake both broad-brush and high fidelity simulations of threats and responses. Table-top wargames/seminars can play a part, together with detailed assessments of scenarios, architectures and effectiveness, using computer models many of which already exist. Whatever ultimately comes about on EBMD, such a facility will be needed, so it would seem timely to begin to build it soon. NATO has a head start with NATO's Command, Control and Communication Agency (NCA) in the Hague, but the US National Test Facility (NTF) at Colorado Springs can help, as can organisations such as UK's defence research organisation, DERA, ONERA in France, the US Applied Physics Lab at Johns Hopkins University, the National Defence University in Washington DC and many other centres.

Implementing EBMD: Command, Control and Communications (C^3)

In the event of an attack on a European state, missiles en-route to country X may well over-fly countries Y and Z. The most appropriate launchers may be in country W, the radar in country V, or on-board ships belonging to country U sitting

off-shore country S. Satellites belonging to country T might be sending early warning data via country R. The whole C^3 system may reside in country Q. Debris from the interception might land on anyone.

The command, control and communication implications of any EBMD are thus profound, not least because it would need to be integrated both horizontally and vertically. If it had a territorial defence architecture, it would be vertically layered to intercept missiles with ranges from 500km up to ICBM range, and be horizontally spread over a wide geographical area. It would therefore have to be a multinational, but also genuinely multilateral, system, rather than a series of individual NMDs for each member. Integrating and managing such a system would be a unique challenge, and one that the United States would not have to face.

One implication is that the early warning system, the terminal phase interceptors that would be necessary for defending against shorter range missiles, and the wider area defence for intercepting longer range missiles, would need to be integrated with each other, and the whole integrated into NATO's command structure. What would result is a super-system: "a group of autonomous systems reliant upon the achievement of interoperability for their successful integration".[38] This raises issues of architecture compatibility and commonality, but also the more difficult area of intelligence and communication. One US Joint Chiefs of Staff paper has pointed out that "In coalition warfare it is essential that issues of releaseability of intelligence information and products be resolved early in the crisis".[39] A US NMD — a single-state system to defend against a single type of missile — faces a simple task in this area by comparison with an EBMD.

A second challenge concerns the inherent nature of ballistic missiles. Their very short flight times mitigate heavily in favour of permissive terms of engagement: the fact that the missile is airborne for such a short period means that the defence system must be able to react quickly and with a good degree of autonomy from central and/or political control. The difficulties involved relate closely to the phase of the missile flight in which the intercept takes place. A system designed for early interceptions gives time for a second intercept if the first is unsuccessful, but also involves a very short decision time between radar pick-up and the firing of the interceptor. It therefore offers little, if any, time for human decision-making, and such activities and procedures would need to be prepared and planned well in advance of any conflict on an expert-system basis.[40]

Such a system contains inherent dangers. The actual target of a missile only becomes apparent as it moves towards its terminal phase. It is then that interception becomes a clear act of self-defence. Early intercept could mean destroying a missile without knowing where it was heading. Indeed, a boost phase system might need to be fully automatic. For example, the Brilliant Pebbles intercept system, developed as part of the 1980s SDI programme, was intended to operate autonomously once it had received weapon-release authority from the ground. Thus without appropriate checks, there is a reasonable chance that such a system could unintentionally intercept a missile test or even an SLV. Jacques Gansler of the Clinton Administration acknowledged this as a key problem with ascent phase intercept: "(boost phase) assumes that you recognize or don't consider the type of launch that is occurring, that it is actually carrying a warhead directed at the United States and not simply a satellite launch or a test launch. Certainly there is no time for human decision-making".[41]

The shooting down of an Iranian airliner by the USS Vincennes in July 1988 is evidence of the capacity for error even when there are human decision-makers present.[42] However, in the case of missiles, this may be less of a problem than it might sound. Missile attacks rarely come 'out of the blue' outside a crisis situation, and thus in practical terms it could be assumed that a missile launch is hostile. Given the short times involved — especially in the shorter-range regions of southern and south-east Europe — this command and control process must be largely automatic, or at least devolved to the operator, sitting at display screens with the 'trigger' nearby. There will be no time for a real time political input. All command and control procedures must have been pre-planned, programmed and agreed in advance. In any event, responsibility for deciding to launch an intercept would have to be substantially delegated downwards: as Charles Swicker's study points out, the permissive rules of engagement inherent to some models of missile defence mean that "individual...officers may be forced to carry out defensive actions that may make national policy without prior or real-time guidance from national leaders".[43]

The only answer to these complexities would seem to be centralised command and control. Each country will need to subsume its national requirements into a single system. National systems would lead inevitably to major arguments and difficulty. The advantages of centralised command and control are: scope for optimum use of defence assets (compared with the chaos of fire-at-will); the possibility of making use of all the available layers; and the ability to use all the available sensor data for tracking and discrimination. However, the complexities of centralised command and control are likely to be formidable. It would require the networking of all sensors, and the willingness of all owners of data to hand it over automatically and immediately, for the benefit of cooperative defence. The computing and software challenge of integrating all this data, of processing it quickly and of deriving a "fire control solution" is potentially the Achilles' heel of the whole system. It would, in short, be the real time processing challenge of the 21st century.

NATO's Current Missile Defence Programme

NATO has been developing an extended air defence/TMD capability, known as MEADS, since

the Brussels summit of 1994, and this was boosted by the adoption of the Defence Capabilities Initiative (DCI) at the Washington Summit in 1999. The DCI was partially motivated by perceptions of a "capabilities gap" between European states and the US, and it therefore placed emphasis on the means to deploy forces beyond NATO's borders. Although MEADS now has only one committed European member left (Italy), the idea of providing TMD capabilities to ground forces appears to enjoy more widespread support, as it is regarded as conforming with NATO's out of area agenda.

Beyond this simple NATO requirement however, lie two further issues: the need for TMD to protect European forces deployed out of area in a non-NATO context, and the need for defences of NATO territory against proliferators on the margins of Europe. In practice, European involvement with 'out of area' states has been issue-driven rather than alliance-driven (e.g. Kuwait) and conducted through ad hoc 'coalitions of the willing'. Britain and France have used their substantial intervention capability to participate in joint operations outside Europe in the Middle East, but none of the other European NATO members have a well-developed culture of force projection as a core task for their military forces. Thus joint power projection between the United States and Europe does not necessarily involve NATO forces, although it always involves NATO members. In an era of proliferating long-range missile capabilities, this raises questions about alliance cohesion, since a state that found itself under missile attack (Britain from Iraq, for example) would in principle be entitled to call in its Article Five NATO guarantee (this was a long-standing strategic concern of NATO's northern tier members). Moreover, the military presence of some NATO members in, say, the Middle East may heighten the sense of exposure to missile threats on the part of NATO members who are not as involved in such strategic theatres. Thus consensus on even the minimalist move to develop and deploy TMD for NATO forces operating in a non-permissive environment could be difficult to sustain.

NATO members are also clearly concerned over the implications of missile proliferation along the south-eastern tier of the Alliance. In 1994 the WEU published a paper which argued that missile proliferation among "regional adversaries" in North Africa and the Middle East posed a genuine threat to Europe, and advocated a European missile defence as a way to combat this.[44] NATO has opened its Mediterranean Dialogue as an outreach to states of strategic interest who are ineligible for NATO membership. Turkey and Israel, both active participants in this dialogue, have indicated that they might be interested in extending their existing military co-operation to include ballistic missile defences.

If the proliferation of longer-range missiles follows the path forecast in the 1999 NIE, demands for defences against short- and medium-range missiles seem likely to increase in the southern-tier NATO states. Meeting these needs through a comprehensive EBMD programme would result in a profound change in its military posture. The consequences in terms of reactions from Russia, China and potential proliferators are described below. In terms of NATO itself, it seems likely that the simultaneous development of US NMD, EBMD and the proliferation of intermediate and other longer-range missiles will lead to a heightened demand by states in the former WTO and USSR to join NATO. Current candidates are likely to clamour harder for entry, and the number of hopeful entrants is likely to grow. This may not be to NATO's interest, given its keenness to maintain stable relations with Russia.

It is thus hard to see how a comprehensive EBMD, as against a mobile TMD, can be squared with NATO's post-Cold War role in the absence of a clear missile threat to Europe.[45] Yet the missile threat to Europe is largely, with the possible exception of Turkey, likely to be a function of activities that do not involve NATO as an institution. This raises the issue of whether EBMD would be implemented via NATO or via another separate institution. The European members of the Alliance seem uniformly opposed to US NMD, but it is difficult to gauge their likely reaction to a European equivalent. However, given that much doubt about the US system centres on technical feasibility and political consequences, both of which apply equally strongly to EBMD, it seems likely that some members at least would be reluctant to sanction any move in principle to deploy a NATO EBMD.

NATO's TMD Feasibility Study

This two-year study, funded from NATO's infrastructure budget, is a low cost attempt by NATO to review the options for a missile defence for deployed forces. NATO's defence companies have formed into consortia, have submitted proposals to NATO for feasibility studies, and await an announcement in summer 2001 of who gets the job.[46] The work that is done against NATO's requirement will inevitably address many of the issues that are relevant to EBMD, including command, control and communications, effectiveness, networking of sensors, early warning and data sharing, mobility, sea-based versus land-based systems, coverage areas, fixed point defences, layered systems, national assets versus imported systems, simulations, testing and so on.

If NATO is to be the organisation to run an EBMD, then this study will provide invaluable input and preparation for a subsequent EBMD study. And the experience gained by NATO in managing the TBMD study should give it a head start in dealing with the larger, more complex and more politically sensitive EBMD work. NATO might, therefore, begin to think about EBMD while the TBMD study is in progress, although NATO is unlikely to move fast.

PART THREE
EBMD AND RUSSIA

Russia has a well-established and regulated deterrent relationship with the US, which provides a framework in which the effects of US NMD can be assessed. Russian concern over NMD is less over short term effects than a fear that, over 20-30 years, US technology might be able to neutralise Russian offensive nuclear capabilities, and that its insistence on moving forward will force the collapse of the existing agreed constraints on the US in the nuclear field. For example, the Chair of the Duma's Committee for International Affairs recently remarked "Everybody understands that [NMD] is an attempt to protect the US territory not from Iran, Iraq or North Korea, but from possible retaliatory strike on the part of Russia or China, if the armed conflict reaches its climax".[47] The Russian strategic relationship with France and Britain, the two European NWS, is more opaque than with the United States. It appears unlikely that deployment of an EBMD will significantly affect the Europeans limited ability to inflict punishment upon Russia or the ability of Russia to do so upon Europe, but a more profound impact will be on Russian perceptions of a US/European alliance to force other states to act in ways that support their interests. This section of the report attempts to piece together a picture of how Russia might therefore perceive, and respond to, an EBMD system.

Russia and Deterrence

Russia's own strategic culture and posture play a significant role in determining the importance it will continue to attach to nuclear weapons and long-range missiles. Russian strategy has generally emphasised the integration of offensive and defensive forces into a single operating concept — a "comprehensive" approach to strategy. In this approach, war prevention and warfighting were never as separate as they often were in Western strategic thought. When coupled with a long-standing historical concern with its periphery, especially along its Western frontiers, these are the key elements in Russian strategic thinking. In nuclear terms, especially during the Soviet era, this tended to mean that the ability to deter was very closely linked to the ability to sustain a warfighting capacity rather than a retaliatory one. Buzan has remarked that Soviet nuclear doctrine "bore the stamp of the artilleryman".[48]

The last decade has seen a growing degradation of the Russian nuclear capability. One reason given for signing the START II agreement was that this would keep Russian strategic forces at the maximum sustainable level whilst simultaneously preventing the United States from expanding its own arsenal without Russian consent. However, the ban on land-based MIRVs has been viewed as a US-imposed and inequitable burden. To maintain START II levels after dismantling its MIRVs, Russia must produce 1500 new single-warhead ICBMs and SLBMs.[49] This makes it unlikely that the decline in Russia's strategic capabilities can be halted in the short term.

In 2000, some ominous changes took place in declaratory Russian security policy, apparently to compensate for what were perceived as increasing military weaknesses. In January the new National Security Concept signalled a change in nuclear doctrine. Previously the strategy had been to use these weapons only in instances where "the very existence of the Russian Federation" was at stake, but the new strategy pledges their use "to repel armed aggression if all other means of resolving a crisis situation have been exhausted". This subtle shift, which neither mentioned Russia nor stressed threats to its very existence, was also reflected in the statement that "multipolarity" and "the West led by the US" were now "mutually exclusive" tendencies. This implies that Russia would tend to see EBMD as little more than an extension of US NMD: an expression of strengthening unipolarity. In practice, this meant a significant lowering of the nuclear threshold, in order to use nuclear deterrence for dealing with regional, conventional conflict.[50] Therefore nuclear weapons may have a role outside global conflict and are more intimately related to Russian strategic policy on its periphery.

Moreover, the new concept stated clearly that military power was being used to dominate global politics by the West — giving a clear if unspoken hint that it would be necessary to find ways to counter this. This was repeated in the new Foreign Policy Concept of 2000, which also accused the US of attempting to establish unipolarity and global dominance, and this perception was probably reinforced by President Bush's inaugural speech. The two key themes in current Russian strategic thought thus appear to be the need to respond to a renewed emphasis on military power in

international politics, and an emergent sense of conflict with the global presence of the US.

Russia and Models of EBMD

As with so much about EBMD, its implications for Russia are inseparable from the architecture that is deployed. A territorial shield EBMD would be a 'thin' defence designed to defeat a limited attack from an unsophisticated enemy, and thus its impact on Russia's missile forces would be limited to the point of being negligible. A boost phase lid, being far less susceptible to countermeasures, has correspondingly higher potential to defend against more sophisticated missiles. However, boost phase involves 'ring-fencing' of particular states and thus can be directed in a way that territorial shield cannot. Such a system seems unlikely to have a major effect on Russian retaliatory capabilities, and this may be one reason why Russia has expressed an interest in co-operating in the development of boost phase defence systems for some years

While a territorial shield EBMD, similar to the current US NMD, would do little to degrade Russia's missile capabilities, there are reasons for thinking that it may have a greater impact on Russian strategic policy. Russian concerns about territorial shield BMD lie not in the implications of current plans, but in future possibilities: for Russia, US plans are potentially the thin end of a wedge, which at some later point may produce a system that would threaten Russia's strategic capabilities. However, the ABM Treaty provides a framework within which Russian concerns regarding US plans can be heard, and means of ameliorating them implemented. It is very possible that the ABM Treaty can and will be amended to permit a thin defence, and thereby curtail (for the time being at least) the possibility of developing a thicker defence against more sophisticated missiles.

Russia has proposed a missile defence system of its own, to be developed and deployed in collaboration with the Europeans. Despite widespread scepticism about its motives and seriousness, the proposal does nonetheless give a picture of current Russian thinking. It proposes a mobile, rapid-deployment TMD system for intercepting missiles up to INF range: e.g. SCUD up to Shahab. In this way it avoids threatening the nuclear capabilities of the P5, all of which use missiles well beyond INF range, and also avoids abrogating the ABM Treaty, which forbids transfer of strategic missile defence systems. The Russian scheme is 'strategic' neither in range (it cannot intercept ICBMs) nor purpose (it cannot be used for national territorial defence, beyond limited area defence), and thus would not be subject to restrictions.

Because the Russian system would be mobile, non-strategic, and can go to the threat if and when it exists, it is more linked to usable force than it is to mutual deterrent capabilities. This is an important distinction. An EBMD that was linked too closely to mutual missile deterrent capabilities, such as one that could intercept ICBMs, would potentially degrade Russian counterforce and countervalue capability, and thereby force reliance on a greater strength of attack to overwhelm the system. Their evaluation of the effect on their own forces of needing the capability of countering both US NMD and EBMD is problematic, but likely to involve enhanced deterrent capabilities rather than missile defence alone. Given the Russian emphasis on warfighting capabilities as a central aspect of deterrence, this is likely to be a cause for concern. The choices facing them would probably be to find ways to overcome an EBMD (countermeasures or MIRVing); to increase reliance on delivery systems other than missiles; or to control EBMD development through a formal arms control agreement.

In terms of conventional weapons, the CFE Treaty regulates the levels of conventional forces in Europe, and the former Soviet Republics in the Caucasus and Central Asia via the Flanks Agreement. Russian concern over its 'near abroad' has already led to force deployments in excess of the agreed limits. The impact of EBMD upon this is difficult to predict, but it has already been noted that missile defences are perceived to remove inhibitions on the use of conventional weaponry, which would offer NATO states a heightened ability to intervene in out-of-area conflicts.

NATO does not fix force levels between Europe and Russia, but is the contextualiser of military power in Europe. The force posture and strategy of the Alliance are pivotal in giving meaning to its members military forces, and so NATO tends to be the medium through which they define the military aspect of their relations with Russia. The tensions caused by the intervention in Kosovo were about NATO's military reach extending beyond its pre-1991 membership borders, not just the enlargement of its membership. In this sense the period 1997 (Madrid Summit) to 1999 (Kosovo) may well be a defining moment in post-Cold War Europe, since this was the period in which NATO made major inroads into Eastern Europe with little consultation with Russia. The sidelining of the PJC during the Kosovo intervention underlined how far the Alliance was prepared to go without Russian support.

One further impact of an EBMD may be to enhance the significance of the Kaliningrad enclave, especially if NATO was to be enlarged in membership to include the Baltic States. As it would then fall within NATO's defence perimeter, any nuclear missiles stationed on its territory to enhance Russian leverage over NATO and outflank EBMD would be a source of considerable friction.

Policy Implications: Russia and European Security

There are three schools of thought in Russia regarding European security: a group who regard the relationship between Russia and the US as the key to Russian strategic policy, and thereby view NATO in those terms; a group who think more in terms of a discrete Russia-Europe relationship and entertain the prospect of a pan-European security system; and those who regard the 'near abroad' in

the Caucasus as the principal source of instability and security problems for Russia.[51]

EBMD is likely to concern the first two groups more than the third. If it were to be deployed with little or no consultation with Russia, the conclusions drawn in Moscow are likely to be grave. With NATO expanding eastwards and also demonstrating its will to intervene outside membership boundaries, it is difficult to see how EBMD could be presented as anything other than threatening. It would be a shield around an increasingly expansion-orientated organisation that the two schools both see as a key potential threat to Russian security interests. The recent Russian proposal of a cooperative defence involving Europe and Russia should not be dismissed entirely: there is a pro-European group in Moscow who see greater co-operation with Europe as the key foundation of Russian stability.[52] Moreover, Russian TMD technology is in circulation in the NATO area: S-300 missiles have found their way to Greece.[53]

If a cooperative EBMD is not forthcoming, that need not mean a breakdown in relations, but some form of Russian military response is highly likely. The previous section highlighted the ABM Treaty issues, and that the most likely Russian response to the abrogation of this Treaty will be an asymmetric one, probably involving qualitative changes in the Russian strategic triad. Most current sources suggest that the most likely course is a limited MIRVing of the Topol M missile, and the strengthening of sea-based capabilities such as the SS-N-23 SLBM.[54] Such an arrangement might also have the added benefit of drawing the political sting of the more hawkish elements in Moscow, who have consistently criticised START as generally inimical to Russian strategic stability.

Policy Implications: Nuclear Weapons and Arms Control

The fact that territorial shield EBMD would not exert immediate effect on Russia's standing missile forces means that its consequences would be found in the future evolution of Russian forces and in Russian perceptions of the intentions of those states to be protected by it. Again, the marked differences in the impact of the boost phase and territorial shield models are worth highlighting. The latter is defined by who is behind it, the former by who it is aimed at. To put it another way, it is politically far easier to see both sides of the defence equation (defence of whom against whom) with the boost phase system. Since a territorial shield EBMD would almost inevitably be paralleled with a US NMD along the same lines, it is reasonable to suppose that the two would exert a joint influence on Russian strategic perception. Russian responses would be driven by long-standing Russian views on nuclear weapons and the integration of warfighting capacities. BMD has an inherent capacity for forcing upwards the scale of warfare and the preparations for it, since overwhelming the system is arguably the most effective way to circumvent it. This being the case, a territorial shield EBMD would have the potential to make Russian nuclear strategy considerably more difficult to implement, as well as changing political perceptions of the relationship with the European states protected by it.

However, these effects are related to developments in a 7-15 year technical time-scale; Russia's current ability to increase its arsenal is very limited. It is also unlikely to wish to see the START regime abrogated, since the US could easily match its build-up, and Russia might see abrogation as playing into the hands of a more hawkish Republican administration. One possible option could be for Russia to pursue the deep cuts it has advocated for the START III treaty (1500 warheads each, as against the 2-2500 proposed by the US) but also negotiate a limited amount of re-MIRVing as part of the agreement. This would allow Russia to pursue mutual reductions in missile and warhead numbers whilst still maintaining some capacity to overwhelm a territorial shield missile defence. At the same time, MIRVing would reduce the number of required missiles and hence be financially very appealing.

This is not necessarily a retrograde step for Europeans. The dangers of land-based MIRVs were always thought to lie in their effect on crisis stability, but reMIRVing in the context of arms control and deep cuts ought to significantly reduce the likelihood of crises occurring. Moreover, this would not degrade British and French nuclear capabilities in the way a Russian NMD would. However, reMIRVing is a likely response to US NMD rather than EBMD, a response designed to maintain Russian capabilities vis-à-vis the US. In order to maintain these capabilities vis-à-vis Europe — and missiles are almost Russia's sole strategic currency in this post-Warsaw Pact era — it may become necessary for Russia to abrogate or amend the INF Treaty. This appears to be a genuine possibility: a prominent Moscow-based analyst has stated that "a decision by the United States to unilaterally abrogate the ABM Treaty will trigger a Russian response to not only withdraw from START II but also the MTCR and the INF Treaty".[55] Even more ominously, research analysts at the Duma recently concluded that, in the event of US withdrawal from the ABM Treaty, Russia would lose its "political instruments to influence US [nuclear policy]", and in this eventuality ought to "abrogate START II, suspend elimination of heavy MIRVed missiles, prevent access of US inspectors to missile sites, prohibit to release information [*sic*] about launches of Russian missiles".[56]

Unlike the reMIRVing possibility, even a partial return to INF deployments does not have an obvious arms control framework. Unregulated breakout from the Treaty would be a significant shift in the strategic balance between NATO and Russia, especially for states such as Turkey that lie very close to Russia's sensitive southern tier. Moreover, breakout could mean deployment of cruise missiles, which are not vulnerable to BMD. In this way, EBMD might generate a military response that it is unequipped to deal with. Unregulated breakout would clearly not be in Europe's interest, and they

have even more reason than Washington to hope for a Russian response that is compatible with arms control regimes.

It is likely that such a response would require some concessions on the part of European NATO members. Since it has to assumed that EBMD would not have the aim of degrading Russian deterrent capabilities or damaging arms control regimes, such a compromise may well be on the cards. There are a number of options, but the underlying purpose will be to simultaneously allow EBMD deployment and protect the integrity of Russia's deterrent capabilities. It may well be that Russia will demand some limited INF capability to compensate for EBMD, or possibly Russian participation within EBMD. The former would probably be a difficult pill for Europeans to swallow, but perhaps not an impossible one.

Policy Implications: Non-proliferation

The principal and most immediate effect of EBMD, however, would be political rather than military or material: the shift in relative military capabilities that are likely to be wrought by EBMD would feed through into Russia's security outlook, which itself means that the impact of a territorial shield EBMD may not be confined to the direct relationship between Russia and Europe. The changes in Russian national security doctrine over 1999-2000 were clearly driven by a conviction that the emergent post-Cold War order was characterised by a clash between the multipolar concept, advocated by Russia and states such as China, and a world of unipolar hegemony imposed by the US and its allies. Whether Russia has the capacity to create this multipolar world is open to serious doubt, but the fear that the US and its allies are prepared to assert their interests by the use of military power is real enough.

The effect of EBMD on regional proliferators is discussed in the following section, but a secondary effect may become visible on Russian policy towards these states. Russian MTCR policy towards Iran and the DPRK is already regarded with suspicion, especially in the United States. For example, the Iranian Shahab-3 ballistic missile programme is believed by US intelligence to be using Russian technology to develop an intermediate-range capability, which would put southern and eastern parts of NATO within reach. It has also been alleged that the DPRK's NoDong (the basis for the Taepondong and also the Iranian Shahab) is in fact a non-deployed Russian missile whose proven design and components had been exported to Pyongyang.[57]

This has been a recurrent source of friction between the US and Russia, and was raised once again by President Clinton during his meeting with President Putin at the Millennium Summit in New York. It is possible, therefore, that in the absence of the economic or technical means to match US military capabilities, Russia may feel compelled to resist US policy by assistance to regional powers, and by bolstering anti-US states. The negative effects of this on the MTCR (which is already struggling to keep pace with missile proliferation) are easy to imagine. It would also significantly strengthen potential threats to NATO states.

Such export policies will be due to political-economic necessity as well as enmity: the collapse of the ABM Treaty regime with the US would simultaneously weaken the position of the pro-arms control liberals in Moscow and create pressures to use arms sales as a means to generate revenue to replace that lost as a consequence of the changed strategic relationship with the US.[58] Moreover, as there is evidence that some missile programmes in states such as Iran are driven as much by 'dabbling', or opportunistic acquisition of available technology, as by identifiable strategic priorities, Russia is likely to find a ready market in these areas for exports.[59]

PART FOUR
EBMD AND 'STATES OF CONCERN'

There are no institutionalised or formal deterrent relationships between European states and those potential proliferant states that, under current circumstances, would constitute the principal strategic rationale for EBMD: they are highly non-established. This is for three reasons. First, a very limited number of EBMD states have a strategic presence outside the NATO area, and only two — Britain and France — have a substantial history of force projection. Second, the regional states in question are relatively new to the field of WMD weaponry, and very new to long-range delivery systems. Their WMD missile capabilities are still future developments rather than existent facts. Third, as noted earlier, European states have generally preferred dialogue and trade as ways of dealing with recalcitrant regimes. These factors — limited and piecemeal military involvement and a preference for non-military options — mean that the impact of EBMD will be intrinsically linked to the extent to which European states have direct military involvement. The dominant strategic motive of regional states will thus not be to intervene in European affairs, but to prevent NATO states intervening in their own activities.

Targeting Strategies for 'States of Concern'

Military Targeting

Ballistic missiles can be attractive deep strike weapons if their range is adequate for targeting adversaries. For example, as early as 1989, Syrian ballistic missiles (SS-21s and SCUDs) had the capacity to strike military targets inside Israel, such as troop concentrations and air bases. A pre-emptive counterforce attack would have severely impaired Israeli strategy, which relied upon large-scale troop mobilisation and deep air strikes, and thus could have assisted an attempt to make limited gains in the Golan Heights.[60] Moreover, Iraq used chemical weapons as part of an 'area denial' strategy during the Iran-Iraq War, and Syria has reportedly developed chemical bomblets for use with SCUD-Cs. These types of weapons can be effective against larger targets such as airfields, or fixed troop concentrations, and thereby can disrupt offensive preparations. Such threats would be theatre-based ones, and an effective TMD capability such as Patriot, the S-300, or THAAD would be required, rather than an EBMD.

Political Targeting

Poor accuracy means that regional ballistic missiles are better suited to large targets, which, when coupled with the psychological effects attributed to them, tends to make them more political instruments than military ones. For example, Iraq attempted such a tactic with its missile attacks on Saudi Arabia and Israel during the Gulf War. These attacks had different objectives (the former was to force a state out of the anti-Iraq coalition, the latter precisely the opposite), but involved similar strategic thinking. They had little military value, but the political consequences of success would have been considerable. Alliances and coalitions, especially involving extra-regional states, are particularly susceptible to such strategies.

Deterrent Strategies for 'States of Concern'

There are three concentric circles at work here: the deterrence of intervention by threatening ICBM attack on long-range countervalue targets; deterrence of intervention by threatening medium or intermediate-range countervalue and counter-force attack on nearby allies (perhaps those supplying basing facilities etc); and central deterrence in order to force a halt in fighting and protect the regional state from complete defeat. It is unlikely that NATO members would mount an assault on a regional power with the aim of total defeat, since all are fundamentally status quo powers, and so it is the first two of these which are of direct consequence for Alliance members. This also means that, above the theatre level, the aim of missile attacks upon NATO members will almost certainly be to affect the political, rather than military, shape of the conflict.

ICBM Attack on Long-Range Countervalue Targets

The principal long-range target is almost certain to be the United States, since it has the most substantial extra-regional military presence in regions such as the Middle East. To be sure, Britain and France also have a deployment, but the chances

of military action by them without the lead of the US are currently remote. This type of attack is the prime driver of US NMD policy, despite the fact that Europeans generally regard it as overstated. However, deterrence of US intervention, not to mention Washington's overwhelming superiority in other weaponry, is usually cited as one of the main drivers of Iran's Shahab programme and Iraq's stalled (for now) missile ambitions.[61] ICBM programmes, in this sense, are based on two questions that Europeans ought to recognise from their own Cold War days: would the US risk an attack on one of its own cities in order to respond to an attack on a faraway country? And is it possible to neutralise a heavy conventional inferiority with missile-borne WMD?

If these questions are answered, respectively, in the negative and the positive, then the US has an interest in negating the leverage this strategy offers to 'states of concern'. In that event, it is likely that those states will develop counter- measure technology, adopt an asymmetric response, such as alternative delivery vehicles, or switch to targeting of US allies as substitute targets. As we noted earlier, it is probable that NMD deployment, and responses to it that affected Europe, that would be the single most instrumental factor in stimulating debate over deployment of an EBMD.

Countervalue and Counterforce Attack on Nearby Allies

A threat to European states is likely to result from the fact that 'states of concern' view long-range missiles primarily as a way to dealing with Washington. That said, discouraging European allies from participating in US-led coalitions has been seen as having at least some motivating power behind the missile programmes of states such as Iraq and Iran.[62] The European states have a diplomatic and economic presence in the Middle East of a different nature to that of the US and, moreover, some are known to be highly sceptical about Washington's punitive policies. The 'critical engagement' policy has been founded on the principle that behaviour can be influenced by communication, incentive and dialogue rather than the dual containment strategy of the US.[63]

Thus European policies towards Middle Eastern states such as Iran are qualitatively different to that of the 'Great Satan', Washington, and are not currently dominated by relationships of military power. Moreover, Iran has explicitly acknowledged that a European political role in the Middle East acts as an important counter to what it sees as US hegemony.[64] This highlights the fact that an assertive US policy towards these states can mean that their links with European states become correspondingly important, while the differences of approach by the Europeans generates strains in the relationships between the NATO states.

It is difficult to say whether the links between European states and potential proliferators would be severed or endangered by US NMD, but it is likely that, for Iran at least, targeting of European states would be a result of European involvement in a military coalition, rather than their value as proxy targets. Libya has been described by one (Italian) analyst as having capabilities that "can be defined more accurately in terms of their scare value than of their military value", and Italy's favouring of political dealings with Libya has already been noted.[65]

However, it is likely that this would all change in the event of EBMD being deployed before a serious breakdown in relations between European NATO members and 'states of concern'. It was suggested earlier that EBMD could be configured so as not to limit Russian deterrent capabilities, but it would be not only difficult, but positively dishonest, to claim to be doing the same for Middle East states, since EBMD would be designed for exactly that purpose. What is the likely response? The prime effect would be a perceived shift in European strategic posture towards a potential compellance strategy, rather than a deterrent one. This would be especially the case in the Middle East states, where the Gulf War was dramatic and conclusive evidence of the superior weaponry of the United States and its allies, and generated a consequent desire for compensatory measures such as ballistic missiles and WMD (this is particularly true in Iran and Iraq). Without this compensatory capability, the ability of Western states to intervene in the Gulf region in pursuit of their interests will be relatively unrestrained, and the ability of states like Iran to defend their own interests correspondingly degraded.

For this reason, the most likely consequences of EBMD upon potential proliferators will be twofold. The first is a heightened desire to develop either countermeasure technology, or asymmetric responses such as alternative delivery systems.[66] Both are likely to be considerably easier for 'rogue states' to acquire if EBMD rides roughshod over Russian and Chinese sensibilities, while asymmetric responses are a particular danger for Europe, given its comparative geographical proximity to the Middle East. The second consequence is likely to be a marked deterioration in the political-economic dimension of relations until such time as these states feel they are acquiring anti-BMD capabilities. In this way it may well mean an increase in threats to Europe, and thereby a startling paradox: EBMD may become a necessity as a consequence of its own existence. To put it another way, deploying EBMD specifically to defend against potential proliferation may generate the response it was designed to combat.

PART FIVE
EBMD AND CHINA

The direct effects of European states upon Chinese strategic doctrine and deployments are currently limited, if not non-existent, but this will perhaps change if the US-European relationship expands beyond the US guarantee to Europe to embrace a common BMD, with all the political symbolism that this would be perceived to imply. There are, however, two indirect conduits by which European states regulate their military relations with China. In the first place, China's nuclear posture is heavily regulated by the US-Russian axis, in which the European states also have a substantial stake, and over which they have an influence. Second, although there is no NATO-style organisation to contextualise military forces vis-à-vis China, the US has a substantial stake in the North East Asian region, and so again the European states have an indirect effect via their own relationship with the US. Thus, Russia is unlikely to be alone in its sense that the US and its allies are increasingly dominating world politics.

China's strategic doctrine focuses on limited warfighting and the ability to maintain local conflicts as local. For the past fourteen years, the limited deterrent strategy has aimed at deterring the escalation of local conflicts and particularly the intervention of outside powers, such as the US, in issues like the future of Taiwan. The Chinese doctrine of Active Defence describes three categories of war in which China might become engaged: a global conflict, a border conflict, or a limited war. The latter two are of principal current concern.

Nuclear doctrine, like much of Chinese military strategy, is concerned to prevent the escalation of conflict. It has, however, been circumscribed in this by quantitative and qualitative shortcomings in Chinese nuclear and missile capabilities, and by domestic political decisions to divert resources to other priorities. This has meant that China has opted for a minimum deterrence policy of limited countervalue strikes, though it has refused to recognise or articulate this officially. The strategy is based on the military grounds that it can deter similar attacks but little more, and the political ones that it favours global missile disarmament. This has led to China placing great store by the continued effectiveness of the ABM Treaty: as long as the Treaty is preserved and the vulnerability of the US and Russia is thereby maintained, small and medium nuclear powers such as China have the ability to inflict significant and probably unacceptable damage even with a small nuclear arsenal. Moreover, China regards the ABM Treaty and its own nuclear arsenal as crucial checks and balances against what it sees as US pretensions to hegemony, and its propensity to intervene in China's dealings with Taiwan.

Nonetheless, dissatisfaction with minimum deterrence has produced something of a dichotomy between declaratory policy and operational strategy in Chinese military doctrine. China has publicly favoured a limited deterrent strategy, but lacks the capability to properly put this into practice. "Limited deterrence" is a loose term, but it appears to be a sort of scaled-back Flexible Response, deploying a limited capacity for counterforce targeting at a range of theatre and strategic targets. The future direction of Chinese capabilities is contingent on a number of factors, but technological developments may mean that Chinese operational strategy will have to continue to rely on minimum deterrence (i.e., a countervalue strategy with a limited number of targets). The prospects for an indigenous MIRV capability without abrogating the Comprehensive Test Ban Treaty are restricted, but China already possesses a MRV capability and may develop this.[67] Abrogating the CTBT would be a serious step, and one authoritative study concludes that China would be more likely to wait and see how the global non-proliferation fabric responds to missile defences before taking it.[68] Other advanced missile capabilities may also be developed to enhance a warfighting capacity.

China's deterrent policy is thus predicated largely upon the ability to fight and prevail in limited regional conflicts, which requires the means to deter intervention by outside powers against whom China's military shortcomings might be exposed. The outside power with the greatest likelihood of intervention is of course the US, and China has regarded the wars in the Gulf and Kosovo as irrefutable evidence that Washington has the capability and will to intervene where and when it chooses. In particular, the use of highly accurate, conventionally-armed precision-guided munitions has increased fears about the survivability of China's small nuclear force: there is a possibility that these weapons could be used to destroy most if not all of the retaliatory capability, with a NMD to defend against those that were not affected. This would remove one of the principal planks of China's entire strategic policy.

Together with the emergence of India's status as a NWS (especially given the possible Indian development of a limited counterforce warfighting strategy[69]), and the permanent presence of Russia, these are the principle influences on Chinese deterrent doctrine. As things stand, the response is geared towards continued development of its advanced nuclear capabilities: improvements in range, payload, accuracy, survivability, countermeasures against BMD (MIRVs), and, in particular, capabilities to destroy space and land-based command and control systems.

EBMD and China

EBMD's impact on China would consist largely of indirect secondary effects rather than primary ones, as European states have little direct involvement in China's periphery. The principal consequence of EBMD would be the knock-on effects of its impact on Russia. China's deterrent relationship with Russia is ambiguous, despite shared concerns about US NMD. It has been argued that the bottom line for China is that Russian weakness will deepen and that therefore Russia cannot be counted upon as a strategic partner. Beyond this, the nature of the Sino–Russian deterrent relationship is not fully understood, but a Russian response to EBMD such as re-MIRVing could generate responses from China. For the shape and nature of Russia's deterrent posture would have to be taken into account in any future Chinese decisions on their nuclear doctrine and arsenal. US NMD would create a common concern for Russia and China, and perhaps a common adversary. But its strategic implications are radically different (there is no Russian equivalent of Taiwan or the Korean issue, nor does China face a NATO), as are the range of possible responses (Russia might extract some START III concessions as a price for an amended ABM Treaty, but any amendment of the Treaty which allowed a US NMD would damage the credibility of the current Chinese nuclear deterrent).

The direct impact of EBMD on China would be more political than military or material, however. China has interpreted US NMD as indicative of the high salience placed on nuclear weapons by the US. An EBMD, protecting two more of the NWS states, would leave China as the only NPT NWS without defences. It would also reinforce the impression that a creditable nuclear weapon delivery system is the ultimate political and strategic currency when dealing with the US and its major allies, and signal a shift in NWS strategic postures towards a mixed deterrence-defence posture with a corresponding emphasis on high-end military technology.

This would be the key place where EBMD would have a direct impact on Chinese policy. As Roberts *et al* put it, the question for the architects of such a shield would be whether they wish to regard China as a state whose missile capabilities should be respected and preserved (as with Russia) or nullified as much as possible (as with Iraq). If Chinese weapons modernisation continues, as seems highly likely, and does so in the new context of deployed missile defences, it is certain that the reported research into anti-BMD technology will also continue and probably grow. This research has apparently involved countermeasure technology such as decoy warheads, radar jamming, and manoeuvrable warheads.[70] The significance is not for NATO or its European members since none has significant force presence on China's periphery, but in the possibility of the transfer of such technology. China is known to supply the Pakistani missile programme, and is strongly suspected of aid to the Iranian one. If the latter were to be aided in countermeasure technology by China, then EBMD may, by its knock-on effects on China, have stimulated its own undoing.

PART SIX
CONCLUSIONS

The material offered in this study demonstrates just how different the current BMD debate in the European NATO states is from its predecessor in the 1980s. While European states may agree with many of the technical evaluations of the WMD threat, they differ in their judgements of its timing, significance and the methods of dealing with it. At the same time, they are inclined to place a greater emphasis than the United States on negotiated arms control regimes and traditional diplomacy as a means of dealing with such threats and sustaining their security. One consequence of this is that for many of these European states, the issue of acquiring a similar type of missile defence to that proposed for the United States, what we have called EBMD, namely one covering all their territory, is just not on their security agenda, nor do they want it to be. They have no position on it. As a consequence, it is difficult to translate their current resistance to a US NMD into a judgement on whether they would be more or less inclined to support an EBMD if the issue were to be raised.

The majority of NATO Europeans now regard themselves as more secure than at any time since 1945. They perceive no imminent threat to their homelands from missile proliferation. In addition, different levels of vulnerability to the missile potentials of "states of concern" have not translated into differential demands or levels of support for an EBMD. One explanation for this is the European emphasis on political intent, as well as technical capabilities, in assessing threats. This also makes them more likely to favour diplomatic responses to the threats that do exist and to those that may exist in future.

Yet it remains possible that a debate on an EBMD may arise, though its most likely trigger will not be a change in threat perceptions. Rather it will be a US proposal to push ahead with an NMD, and to offer to share the technology with NATO Europe. Such an offer would be unwelcome from a budgetary perspective, something not explored in detail above. It would force the Europeans to make hard choices concerning their defence expenditure priorities, at a time when they appeared relatively settled and there was considerable consensus around them. It would also be seen to threaten the current arms control structure that underpins European security and, through threatened Russian reactions affecting the INF and MTCR, leave Europe exposed to new direct and indirect missile threats. At the same time, many European would see such a debate as being linked, symbolically if not directly, to the future of NATO in the manner of earlier debates over the deployment of new nuclear-related technologies. They may thus feel pressured to go along with considering an EBMD even if they see no pressing need for it and have concerns that it will generate a self-fulfilling prophecy, through the deployment of defences against specific states generating an action-reaction arms race.

Such considerations would inevitably open up politically significant gaps between the European NATO states — and some EU non-NATO ones. Fault lines seem likely to occur in four areas. One is that while some of the states in the south and east are already facing a technical threat from short and medium range missiles, it will be many years, if not decades, before the states to the north and west will be subject to similar threats from long-range missiles deployed by "states of concern". A second is that two European states, France and the United Kingdom, are not only nuclear-weapon states, but also have the capabilities to engage in power-projection outside of the European NATO area. They regard their nuclear forces as capable of deterring threats upon their own territory, but see a possible need for a TMD for their own forces when operating in an intervention role. Other European NATO states, however, may be concerned that they will be subject to missile counter-threats against their own territory to put pressure on France and the United Kingdom, and any other alliance partners involved in such interventions, to desist from such interventions.

A third fault line is that while Britain and France and other western NATO states may now regard the missile threat from Russia as negligible, and capable of being countered by their nuclear capabilities in the context of a well-established set of nuclear deterrence relationships, the more easterly NATO states may regard these threats as more significant, and necessitating a defensive response. Finally, while the more industrially advanced states of NATO-Europe may regard missile defence as an area where they can advance their technical capabilities and where their industries can acquire lucrative development and production contracts in partnership with US firms, those elsewhere will not be able to share in these benefits, and thus be less inclined to support work in this area.

Once the United States makes a decision to proceed with NMD, the European states, both within and outside NATO, will be subject to conflicting demands from the United States and Russia. These would probably be in the form of accepting US arguments for its need of an NMD, or developing a closer and more direct political relationship with Russia to neutralised the threatened political effects of an NMD for European security. Concerns in the latter area would focus in particular upon the INF Treaty and the MTCR, for Russian withdrawal from the INF Treaty would put all of Europe potentially at risk from such missiles. Deploying an EBMD seems unlikely to figure large in discussions with Russia, however, unless it involved a role for Russia as a provider of technology and other assistance in building such a system, rather than being one of the targets for it. It is in the context of these conflicting demands that the threats, direct and symbolic, to the future of NATO as an institution may become focused.

One characteristic of any current debate on EBMD, and also the post 2000 US debate on NMD, is that it is taking place against a background of little discussion about the architectures of the defence systems that may be developed and deployed. In the European context this would be dependent upon which states wished to be defended (though some states would automatically be defended if their neighbours joined the system); the type of system adopted; and the availability of technology from either the United States or Russia. Who chose to participate in the system would determine where its facilities, such as radars, interceptors, command and control systems and other architecture elements would be situated. This in turn would generate additional vulnerabilities to pre-emptive strikes and debris from interceptions. All of these issues are likely to be very sensitive politically.

The choice of architecture, territorial shield or boost-phase intercept, would also be highly significant, both in terms of the availability of the technical building blocks for each type of system, and for its political implications. Boost-phase has considerable political attractions as it is capable of being targeted against specific states, and being seen to be so. It also has the potential to be a joint European NATO/US system, by contrast to a non-space based territorial shield. However, it would have to be near-automatic in operation, thus opening the possibility of inadvertent destruction of satellite launch vehicles and missiles aimed at regional opponents, while the political decision to deploy such a system might prove difficult to take. Territorial shield suffers from the problem of generating concerns over its ability to move from a thin to a thick system, which would threaten the deterrent capabilities of existing nuclear-weapon states.

Technically, the key characteristic of any land or sea-based territorial shield EBMD system would be that it would need to be designed to address a range of ballistic missile threats, and thus would need to consist of several different systems integrated together [short, medium and long-range], a problem that would not confront either a US land-based NMD or a space-based system. Moreover, such a system would only be common with that of the United States in terms of some of its technology, not in the majority of its components and functioning, unlike the concepts advanced for the SDI of the 1980s. Above all, however, it would have to have a single European command and control system. Yet it is at this point where the most intractable problems seem likely to occur. It is difficult to imagine how the countries of Europe could reach a political consensus on acquiring such a common system, when what is required to defend Turkey or Italy (and when) is quite different to what is required to defend the United Kingdom and Norway (and when), even if the alternative was piecemeal and uncoordinated investment in systems that provided limited, local and flawed defences for those that saw a need for them. In short, Europe is not a single state and, without that political context, the necessary infrastructure, procurement and command and control decisions that would be needed to create an integrated NATO EBMD along US NMD lines appear near-impossible to contemplate. This also implies that any US offer of technological partnership in an EBMD would be highly problematic.

What may be possible, however, is to work on a concept for an EBMD system that would facilitate adaptation (to take account of evolving threats); that is layered (giving the best defences for all); and which might be affordable (by procuring common assets such as sensors, launchers, interceptors and command and control systems). Above all this would need a modern, open architecture, and require member states to subsume some national interests for the benefit of the whole. Such a system could then form the basis for an effective EBMD if, at some future point in time, the political processes of Europe have proceeded to the point where such a completely integrated EBMD was possible.

Despite this negative political and technical assessment of the possibilities for an integrated EBMD, it remains useful to evaluate its possible political consequences upon states outside the NATO region. The impact upon Russia appears to be heavily dependent upon the evolution of the US-Russia-NATO Alliance nexus, and whether Russia can be assimilated into this nexus or will regard the US-NATO alignment as the major threat to world peace and security, and thus something which has to be consistently opposed. For the combination of NMD and EBMD are likely to be regarded internationally as devices to give the US and their European allies unfettered freedom to use their advanced conventional weaponry to intervene in the affairs of other regions. In this latter context, Russia's reaction to EBMD is likely to be an extension to that to the US NMD, though this might be modified, if Russian technology and facilities were to be incorporated into the system.

For the states of concern, regional conflict appears to be the driver of missile proliferation, and thus its response to EBMD is unlikely to be the

abandonment of missiles with increasing range. Moreover, while EBMD might serve as a tool in managing such proliferation, it could also serve to justify and accelerate it. This problem would be even more significant if a boost-phase system was deployed, as the identification of the target states would them become transparent, as would the associated threat to intervene in regional conflict.

China seems unlikely to be a driver for EBMD, but at the same time it is difficult to see how EBMD would be a driver for Chinese nuclear or other defence policies, except through perceptions that it was a political and military extension of a US NMD. China lacks any formalised deterrence relationship with the European NATO states, and there is no longer any overt reason why it should regard them as likely to intervene militarily on its periphery, other than in association with the United States.

This study has focused upon NATO Europe, rather than EU Europe. The distinction is significant, as NATO-Europe implies a Europe of individual nation states, while EU Europe is already seeking to move forward with a common security and defence policy, and can be seen as developing certain of the attributes of a federal state. As one conclusion of the study is that without the further development of those attributes, an integrated EBMD may not be politically feasible, an EBMD linked to the EU may be regarded as more feasible than one linked to NATO. Yet at the same time, as is becoming increasingly apparent after the EU summit in Nice, an EU Europe incorporating the former European neutrals is likely to pursue different policies from a NATO Europe, both in terms of its relationship with the US and with Russia, China and states in the Middle East. Thus while on the one hand an EU-Europe might offer a more permissive political infrastructure for the development and deployment of an EBMD, its nature, technological base and motivations might be significantly different from a NATO-based EBMD.

What this study has perhaps demonstrated more than anything else is that beneath assertions that a US NMD would enhance the security of the NATO European states lurk many specific political and technical issues that have yet to be examined in any detail. This suggests that a core element in any future NATO debate on US NMD and EBMD must be to recognise the unique geographical, technical and political challenges of extending US missile defence technology to its European NATO allies. Only if these are explored fully and effectively is a consensus on whether and how to move forward going to be possible. This suggests that NATO will need to explore the detailed operational requirements for such a system, in a similar way to the process it has just initiated for a TMD. Through this process, areas where co-operation, common industrial development, technological development and a possible role for Russia could be identified; options for its architecture and operational processes discussed; and all of its consequences and budgetary consequences analysed. This intra-NATO process could also be complemented by a NATO-Russian co-operative threat reduction initiative, and by moving forward with the MTCR Code of Conduct Against Missile Proliferation/ Russian GCS discussions, to create an alternative, politically driven path to address the problem of opaque missile proliferation, and by extension opaque intentions.

References and Notes

1. Denmark could overrule the Greenland parliament if it wished, but this is described as "unlikely". See Joergen Dragsdahl, 'Danish Opposition May Impede US National Missile Defense', BASIC Nuclear Futures Paper [British American Security Information Council], 7 March 2000.
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