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General Nichols,

Recommend Deep Attack article which, I believe, tells our story in no uncertain terms. It also deals with Soviet responses in about the same manner as I have outlined in a draft TOR. This article is right on target; how it is unclassified is a mystery!

Hank

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DEEP ATTACK IN DEFENSE OF CENTRAL EUROPE: IMPLICATIONS FOR STRATEGY AND DOCTRINE

by

John R. Landry
Colonel, US Army

Malcolm B. Armstrong
Colonel, US Air Force

Howell M. Estes III
Colonel, US Air Force

Wesley K. Clark
Lieutenant Colonel, US Army

Boyd D. Sutton
Central Intelligence Agency

Colonel John R. Landry, US Army, has command and staff experience in Europe, including an assignment as Special Assistant to the Supreme Allied Commander, Europe. Colonel Malcolm B. Armstrong, US Air Force, has served primarily in Europe with forces committed to NATO. Colonel Howell M. Estes III, US Air Force, has extensive experience in Europe, including a tour at HQ US Air Forces Europe. Lieutenant Colonel Wesley K. Clark, US Army, has served in various locations, including Germany, and as Assistant Executive Officer to the Supreme Allied Commander, Europe. Boyd D. Sutton, Central Intelligence Agency, has specialized in Soviet and European military subjects for most of his career. All five authors are 1983 graduates of the National War College.

INTRODUCTION

In 1967, NATO's nations formally adopted the Flexible Response strategy and thus acceded to a long-held US view that deterring Soviet aggression requires strong conventional forces. Notwithstanding the bitterness and divisiveness of that decision, Alliance nations committed themselves to a series of ambitious defense programs to implement it. Execution of those programs has been neither uniform nor complete. But they have yielded a remarkable improvement in NATO's conventional forward defenses. In an absolute sense, Alliance forces are stronger today than at any time in their history.

But although Alliance forces have never been stronger, concern for NATO's ability to deter aggression has never been greater. The relentless pace of the Soviet buildup, both in terms of added force structure and improved armaments, outmatched Alliance defense efforts throughout the seventies. By the end of the decade, many analysts questioned whether existing defense programs were likely to produce a conventional defense equal to the needs of the Flexible Response. At the same time, few suggested that increased reliance on nuclear weapons made any sense, particularly in view of substantial Soviet strategic and theater nuclear force gains.

Even so, many Western defense analysts and government officials are optimistic that the Alliance can yet provide for a conventional defense sufficiently strong to make credible the Alliance's deterrent strategy. The source of this optimism is what are generally labeled Deep Attack concepts. These concepts reflect a renewed faith in the superiority of Western technology and the ability of NATO's forces to adapt technology to their tactical and strategic advantage. Emerging Deep Attack technologies—capabilities to locate, target, and destroy or delay enemy forces well forward of the line of contact—are believed to offer NATO an opportunity to offset quantitative superiority of Warsaw Treaty Organization (WTO) conventional forces.* Armed with such

*Integration of doctrine, technology, and force structure are discussed under "Doctrinal Implications of Deep Attack Concepts." The key weapon development programs and the timelines for their availability are discussed in appendix A; cost implications are treated in appendix B.

capabilities—some of which exist now—and employing appropriate doctrinal and procedural modifications, NATO's forces are thought to be capable of preventing the Soviets from breaking through Alliance forward defenses.

While generating optimism and intense interest in various technologies, Deep Attack concepts have also raised a number of issues. Many analysts, especially in Europe, question whether and how Deep Attack concepts will restore credibility to NATO's Flexible Response strategy. Some also question the wisdom of strengthening conventional capabilities; they see it as a move away from reliance on the nuclear deterrent that has provided for peace in Europe. In addition, whether potential Soviet responses to NATO's adoption of Deep Attack could enable the WTO to offset the new doctrine and weapons capabilities is not at all clear.

Deep Attack concepts have also raised doctrinal issues. The most fundamental question concerns the relationship between the objectives of Deep Attack and the scheme of ground maneuver. Another question concerns US and Allied views on allocation of airpower and procedures for air-ground coordination.

This essay addresses those issues by attempting to answer three questions. First, how can Deep Attack concepts be used to reinforce NATO's ability to deter aggression in Europe, or to improve NATO's chances for successfully implementing its strategy should deterrence fail? Second, how should US and NATO planners address the doctrinal and procedural issues that must be resolved if Deep Attack concepts are to be implemented? Finally, how will the Soviets respond to Deep Attack concepts, and how will their response affect the concepts' viability?

WHAT IS DEEP ATTACK?

Deep Attack concepts emerged from the interaction of three related but distinctly different influences: NATO concerns with the unrelenting buildup of WTO conventional forces in Central Europe since the late sixties; dissatisfaction with a defense doctrine widely regarded within the US Army as excessively reactive; and emergence of technologies that offer the potential for substantially better target acquisition and more lethal conventional weapons.

The outline of Soviet operational strategy in Central Europe has been clear for at least a decade. That strategy seeks a quick penetration of NATO's forward defenses and a rapid advance into the strategic depths of Alliance territory. The Soviet goal is to forestall full mobilization and reinforcement from the United States and to bring about early military and political collapse of NATO.

On the ground, the Soviets pursue this strategy by concentrating overwhelming force and by committing forces in succeeding echelons to maintain the momentum of combat operations. First echelon forces fix NATO's forward forces in position or destroy them. Second echelon forces complete the destruction of NATO's forward forces and flow through lines of least resistance to penetrate deeply into NATO's rear and disrupt the Alliance's ability to reinforce. WTO follow-on forces are thus critical to the overall strategy.

Meanwhile, WTO air forces hope to neutralize NATO's airpower. They will concentrate virtually the entire Western Theater of Military Operations' air capabilities against NATO airfields, ground based air defenses, nuclear storage sites, and command and control systems in a series of theater-wide strategic air operations. The WTO anticipates heavy losses but expects to cripple NATO airpower and to be able to deny NATO air superiority.

By the mid seventies, the WTO strategy and Soviet improvements in conventional doctrine, armaments, and force structure converged to create severe doubts about whether NATO could mount a credible direct defense. Two aspects of the Soviet buildup were particularly threatening. First, the Soviets appeared to be aiming for a short-warning attack capability by reducing their reliance on early reinforcement from the western military districts of the Soviet Union. Larger divisions armed with greater numbers of more advanced weapons, improved logistics support, and increased readiness were all part of this effort. These improvements threatened to reduce substantially both strategic and tactical warning. Thus, they would reduce NATO's ability to countermobilize, deploy forces forward, and prepare defensive positions.

Second, the Soviets launched an ambitious effort to achieve and maintain rapid attack advance rates. The Soviets concentrated on systems to exploit a high-speed attack. These systems included infantry combat vehicles, mechanized artillery, increased tactical aviation and helicopter gunships to provide continuous close support, and more effective antiaircraft weapons to suppress enemy airpower. Additionally, the Soviets emphasized development of more rapid and flexible command

and control procedures for ground, air, and air defense forces. Specific efforts focused on improving their capability to commit follow-on forces where and when they would achieve the greatest effect; to shift combat effort from one axis to another, depending on rapidly changing circumstances; and to coordinate the efforts of adjacent combat formations.[1]

Together, these trends attacked the credibility of NATO's Flexible Response strategy. They threatened to force an early political collapse of the Alliance before NATO could decide to escalate to the use of nuclear weapons. NATO must have a strong direct defense, capable of providing time for Alliance leaders to reach a nuclear decision, and confidence that continued resistance is militarily and politically feasible. Without such a direct defense, the very basis of Flexible Response is seriously eroded.

While US Army commanders in Europe were concerned with these trends, they were also disturbed by the Army's existing land force doctrine—the Active Defense. Many believed this doctrine was inappropriate to the nature of the Soviet challenge. They indicted Active Defense on three counts. First, it was excessively reactive; it ceded the initiative to the attacker by discouraging maneuver of forces against enemy vulnerabilities. Second, it focused too much on massing firepower at the point of an attempted Soviet breakthrough, where the enemy's strength was concentrated. Lateral movement of friendly forces in the face of WTO massed formations presents problems, and combat force ratios in these areas continuously and overwhelmingly favored the attacker. Finally, the doctrine seemed to endorse an attrition oriented defense. Therefore, it seemed to risk early exhaustion of forward forces by subjecting them to continuous operations against fresh, fully structured enemy units fed into the forward battle from reinforcing echelons. In short, Army commanders doubted the success of a doctrine that confronted wave after wave of echeloned WTO forces with a linear, positional defense.

As Army commanders wrestled with this problem, technological developments converged to offer some promise of offsetting Soviet quantitative superiority. Developments in a number of areas—particularly in sensors, data processing, terminal guidance, and conventional munitions effects—offered a potential for more effective engagement of mobile targets at extended ranges.

As the potential of these technologies became more apparent, proposals for their strategic and tactical application proliferated. Some spoke of strategically isolating the forward battlefield by destroying the enemy's capability to reinforce; others envisioned attacking key WTO command and control capabilities to deny the aggressor an ability to

employ his echeloned formations effectively. Virtually all proposals suggested that emerging capabilities would reduce—some even said eliminate—NATO's reliance on nuclear weapons, both by stiffening the forward defense and by making conventional arms nearly as lethal as low-yield nuclear weapons.[2]

By the late seventies, these factors converged to produce doctrinal change, which incorporated emerging Deep Attack technologies. Two doctrinal concepts emerged in short order: the US Army's AirLand Battle doctrine and SHAPE's Follow-on Force Attack (FOFA) concept. Both of these concepts incorporated attacks on WTO follow-on forces to meet the increasing challenge of Soviet conventional force improvements.

The key assumption behind all Deep Attack concepts is that NATO and WTO forces *in the first echelon* are relatively evenly matched; therefore, NATO can provide a credible forward defense at the conventional level *if* it can keep WTO reinforcing echelons out of the forward battle, or at least allow them into it when and where most advantageous to NATO. This essential equivalence in the first echelon exists because NATO's forward defense policy requires placement of virtually all its ground combat power forward in the "first echelon." And while the WTO has more units and weapons theater-wide, terrain limitations, the need to operate somewhat dispersed because of the potential for use of nuclear weapons, and the basic WTO doctrine of operating from deeply echeloned formations all but preclude the WTO from using its theater-wide advantage at the line of contact. Using the inherent advantages of defense, and so long as the WTO's large follow-on forces can be held out of the forward battle, NATO's chances for a succesful forward defense are improved.

We now turn to the specific proposals and the issues they raise.

AirLand Battle Doctrine

The US Army began reevaluating its tactical doctrine during the late seventies. By early 1983, the Army's Training and Doctrine Command, working closely with the US Air Force's Tactical Air Command, had developed and gained the two Service Chiefs' approval for a new doctrine called AirLand Battle.* AirLand Battle doctrine focuses on combat operations of the corps and subordinate elements. It seeks to win battles,

*AirLand Battle doctrine was published in a revised US Army Field Manual, FM 100-5, on 20 August 1982. By early 1983, the Chief of Staff, US Air Force, expressed his support for the new doctrine.

not wars, recognizing that successful military operations are indispensable but are insufficient to guarantee victory.[3] Finally, it seeks to employ existing weapons and forces more effectively rather than prescribing development of new ones.[4] Thus, while recognizing that it would benefit from technologies that should be fielded in the next several years, it does not depend on them.

Within the limits noted above, AirLand Battle doctrine attempts to deny success to an aggressor's attack by seizing and maintaining the initiative.[5] To do this, the doctrine specifies the need to break the momentum of the enemy's attack, to destroy synchronization among the elements of attacking forces, and to defeat those forces piecemeal. Two battles must be fought simultaneously and in close coordination: a forward battle against committed units; and a deep battle against uncommitted forces, both to delay and disrupt their commitment to the forward battle and to create opportunities for subsequent maneuver against them. While the doctrine seeks a balance between maneuver and firepower, it particularly emphasizes maneuver. Maneuver is the way to concentrate strength against enemy weaknesses and gain a position of operational advantage from which to mass effective fires against enemy vulnerabilities.[6]

At the outset, AirLand Battle recognizes that Deep Attack—or the deep battle, as it is termed—is a prerequisite to successful execution of the doctrine. Because the doctrine focuses on corps operations, it envisions the conduct of the deep battle out to 100–150 kilometers—the limit of the corps commander's area of influence. US Army Field Manual 100-5 specifies that the corps commander's area of influence extends far enough beyond the Forward Line of Own Troops (FLOT) to "engage enemy forces which can join or support the main battle within 72 hours." The geographical extension represented will vary according to the commander's mission, the enemy, the terrain, and friendly forces available. In general, the geographic limits of the corps commander's area of influence will not exceed 100–150 kilometers.

Deep Attack delays and disrupts the reinforcement of uncommited enemy forces and limits their availability for commitment to a time and place in the defender's advantage. Thus, Deep Attack both creates the opportunities for maneuver and permits its execution. All capabilities under the control of or provided in support to the ground commander (such as artillery, air support, electronic warfare, and deception), as well as the maneuver of friendly ground forces, are available to execute the deep battle. Of these, the Army recognizes that "battlefield air interdiction"—a NATO term not yet accepted into US joint doctrine—is the primary means of fighting the deep battle at extended ranges.[7]

The SHAPE Follow-on Force Attack Concept

Shortly after assuming responsibilities as Supreme Allied Commander, Europe (SACEUR) in 1979, General Rogers tasked the SHAPE staff to develop a concept for holding Soviet follow-on forces at risk with deep conventional fire. The SHAPE concept seeks to locate and track WTO forces during their entire process of deployment—from garrison to battlefield commitment—and to attack them when and where they are most vulnerable. The concept aims to exploit particularly critical enemy vulnerabilities in the reinforcement process: the rigidity of planning for an echeloned offense, the density of forces along limited attack routes, and critical transportation facilities.

Like the AirLand Battle doctrine, SHAPE's Follow-on Force Attack concept seeks to link the deep battle with the combat operations of forces in contact. But the means of doing so are vastly different. The SHAPE concept, unlike AirLand Battle, does not seek to synchronize the deep battle with the ground commander's scheme of maneuver. Instead, the SHAPE concept focuses on the centralized application of all Deep Attack assets to separate first echelon and second echelon forces. Success in this task will maintain NATO-WTO combat force ratios in the first echelon at a manageable level.

Issues Surrounding Deep Attack

Deep Attack concepts have received enthusiastic support from many quarters in NATO. But two major issues have caused continuing, often heated debates: the ambiguity of the concepts' implications for strategy and the persistence of doctrinal disagreements regarding the relationship of Deep Attack to the forward battle, including the allocation and control of airpower. Moreover, questions have arisen regarding the accuracy of underlying assumptions about Soviet doctrine and measures the Soviets might take to counter AirLand Battle, the SHAPE concept, or Deep Attack in general.

The strategic issue in this debate derives from European suspicion about American planning. The Europeans fear that strategic nuclear parity has driven American planners toward either a conventional or a limited nuclear defense option to escape the risks of a strategic nuclear exchange inherent in NATO's Flexible Response strategy. Either option is

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abhorrent to Europeans. The first raises the specter of a conventional Central European conflict every bit as devastating for Europeans as a nuclear conflict. The second threatens to confine a nuclear conflict to Europe. Regardless of the outcome of such a conflict, NATO Europe would emerge a strategic loser due to the devastation. Today, as in the past, US strategic nuclear guarantees are viewed by West Europeans as indispensable to a workable deterrent strategy.

Understandably then, any defense initiative that even remotely suggests a modification of Flexible Response will draw immediate fire in NATO. Deep Attack concepts have been caught in this fire, not because they challenge Flexible Response but because they have not been recognized as prerequisite to it. In short, Deep Attack concepts must be securely linked to NATO's current strategy if they are to receive Alliance support.

Doctrinal issues are multiple. First, where on the battlefield should NATO focus the brunt of its Deep Attack capabilities? (This question addresses both existing capabilities and those to be developed in the future.) By its very nature, AirLand Battle generally favors attacking enemy follow-on echelons located within the corps commander's area of influence (that is, within 100–150 kilometers of the FLOT). Other doctrinal proposals seemingly favor attacking enemy forces at much greater depths. The SHAPE concept seems to favor neither, although staffs at both SHAPE and AFCENT appear to favor deeper interdiction. For now, however, they recognize that the range of most current Alliance air and missile systems precludes concentrating efforts in a deep interdiction battle. This issue affects both decisions on the evolution of air-ground procedures and, more importantly, the design of future area surveillance, target acquisition, and Deep Attack systems.

Second, where in the command structure should NATO integrate air and ground operations? AirLand Battle seeks integration at the corps level; the SHAPE concept favors integration at the army group and region levels. Current procedures for allocating air support to and coordinating air interdiction operations with the ground battle generally support the SHAPE concept; they are inadequate to support AirLand Battle.

Finally, Soviet strategy for conventional operations in Europe clearly requires a consistently high tempo of attack leading to early, decisive breakthrough of NATO's forward defense. Although Soviet doctrine leads to the echeloning of forces—from the battalions in contact to second echelon regiments, divisions, armies, and even *fronts* moving

forward from the western USSR—the bulk of Soviet combat power is forward with the first echelon divisions; that is where they believe the decisive battle will be fought. Recent weapons developments and changes in force structure have already added to the combat power of forward forces. And the Central European terrain would allow the WTO to put even more divisions in the first echelon. These developments and a wide range of options available to the Soviets raise questions about the underlying assumptions and the durability of AirLand Battle and the SHAPE concept.

These strategic, doctrinal, and enemy force issues combine to pose severe obstacles to the implementation of Deep Attack concepts. We now turn to those issues.

DEEP ATTACK AND NATO'S FLEXIBLE RESPONSE STRATEGY

Alliance deliberations regarding the political acceptability and military utility of Deep Attack concepts will turn first and foremost on their implications for NATO's strategy. To some extent, this is true because various US authorities have emphasized the concepts' strategic value. But more importantly, Europeans are concerned that new doctrinal designs indicate possible shifts in the agreed strategy of Flexible Response.

The reluctance of US and NATO officials to state publicly the strategic implications of SHAPE's Follow-on Force Attack concept and the Army's AirLand Battle doctrine has contributed to this unease.* In the absence of such a statement, misconceptions have dominated the debate, often in ways that cause many allies to suspect the worst. Consequently, European suspicions threaten to derail valuable adjustments to NATO's tactical doctrines—adjustments that could make NATO's Flexible Response strategy more credible—and to slow the exploitation of promising new conventional technologies.

We will now identify the sources of European concern; demonstrate how Deep Attack concepts can be consistent with and essential components of NATO's Flexible Response strategy; and recommend a way to

*This seems to be changing. For example, an article on the subject by General Rogers appeared in the February–March 1983 edition of *NATO's Sixteen Nations*.

strengthen Flexible Response through adaptation of various elements of Deep Attack concepts.

European Concerns

At the outset, we must recognize that influential segments of the European NATO community have supported Deep Attack concepts as potentially productive in strengthening the Alliance's conventional capabilities. For example, Sir Julian Critchley, the British Conservative Party's Defense Committee Vice Chairman, has given a strong endorsement. In an article written for the *Daily Telegraph* in November of 1982, Critchley supported both Senator Sam Nunn's call for NATO to adopt AirLand Battle concepts and General Rogers' outline of the need for a Deep Attack capability.[8] Similarly, Manfred Woerner, Defense Minister of the Federal Republic of Germany (FRG), has urged the exploitation of emerging technologies.[9] And General Meinhard Glanz, Inspector General of the Bundeswehr, has stated explicitly the need to prevent the reinforcement of Soviet follow-on forces to assure a strong forward defense.[10] Despite these endorsements, however, major concerns remain.

Europeans are primarily suspicious that the new doctrinal concepts will either provide the basis for a conventional deterrent capability independent of nuclear escalation or lay the foundation for warfighting in which the use of nuclear weapons is confined to the European theater. The French explicitly communicated concern over the first of those possibilities in response to a 30 September 1982 speech by SACEUR in Brussels. In that speech, General Rogers noted the significant advantages to be gained by exploiting technology to attack WTO follow-on forces. He also observed that NATO's technological edge permitted development of such a capability and commented that a 4 percent gross national product (GNP) allocation to defense by all NATO nations would suffice to procure it.[11] The French newspaper *Le Monde* charged that the concept was a move toward a "no early use" policy for nuclear weapons—believed to be no better than a "no first use" pledge. It also decried the apparent shift in American perceptions of the role of nuclear weapons to deterring destruction rather than invasion. *Le Monde* also questioned how firmly the United States would continue to support Intermediate Range Nuclear Force (INF) deployments if longer range nuclear systems became secondary to conventional Deep Attack capabilities.[12]

The French have been the most vocal and explicit in their critique of Deep Attack concepts. Indeed, they have been the most critical of any defense initiative that appears to erode the credibility of Alliance nuclear

deterrence. But other European nations share the concerns from which those criticisms arise. Many Europeans, particularly the West Germans, share the French concern that the decoupling of US strategic nuclear guarantees from the defense of Europe is one of the greatest dangers facing the Alliance today. While most Europeans—not the French—recognize the need for improved conventional forces to make credible Flexible Response, many suspect the US intention in pushing hard for such improvements. They believe the US proposals are driven more by a desire to avoid a nuclear decision altogether than by a desire to make credible NATO's threat to escalate a conflict if necessary. Those who hold this view point to the "no first use" advocacy of former US officials as confirmation of their position.[13] Europeans fear this development because it would eliminate the incalculability of risks confronting the Soviet Union. Thus, it would lower the threshold of conventional aggression.

We should not be surprised, then, that Europeans are distressed when various Deep Attack advocates suggest that emerging conventional technologies "may provide a conventional military power so formidable as to rival in the tactical arena the deterrent effect nuclear weapons have had on strategic war."[14] Such views focus on what many Europeans believe is a dangerous conception—that a successful conventional option by itself is capable of deterring Soviet aggression.

On the other hand, some Europeans believe that the new US concepts of Deep Attack may call for both nuclear and conventional capability, and that this could lead to plans for the use of nuclear weapons in a warfighting role. They find such a strategy even more frightening than the drive for a conventional-only option. During the Enhanced Radiation Weapon debate in Europe, Manfred Woerner, then a leading West German CDU/CSU defense spokesman, made clear the rejection of a theater nuclear warfighting doctrine confined to Central Europe.

> It is equally clear that a separation of tactical nuclear weapons from the strategic nuclear level is absolutely unacceptable for us Europeans.
>
> The territory of the USSR cannot be allowed, in theory or practice, to become a sanctuary in the nuclear phase of a conflict in Europe. The Soviet Union cannot be invited to contemplate a war limited to Western Europe, or even to German territory. Moscow must at all times be forced to reckon with the full ladder of escalation.[15]

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Some Europeans have noted with concern several briefings of AirLand Battle. These briefings reportedly discussed nuclear targeting decisions that might imply the need for early, perhaps even preconditional, release authority for NATO commanders to use nuclear weapons.[16] And of course, since AirLand Battle doctrine remains focused at corps operations or below, discussions of nuclear use are generally confined to warfighting implications. This fact is understandable, but it has disturbing implications for Europeans nonetheless.

Some NATO nations, particularly West Germany, are also sensitive to assertions that AirLand Battle doctrine envisions the conduct of strategically offensive ground operations. The FRG has accepted Deep Attack concepts in general. But the Bundeswehr's Inspector General has been extremely careful to reject any notion that German forces are, or will be, structured logistically to attack deep into WTO territory.[17] In part, rejection of such capabilities reflects NATO's defensive orientation. But it also acknowledges that the specter of an offensively capable Bundeswehr is acceptable neither to the Soviets nor to the FRG's continental allies.

Finally, the European media have suggested occasionally that the maneuver oriented AirLand Battle doctrine constitutes a retreat from the Alliance's concept of a forward defense.

These concerns may be erroneous and inconsistent. But they reflect considerable confusion regarding strategic versus tactical purposes of Deep Attack concepts and the doctrinal context to which the concepts are related. This confusion highlights the need for a militarily sound and politically acceptable justification for Deep Attack concepts if we are to continue the considerable progress attained to date.

Strategic Rationale for Deep Attack

The litmus test for determining the political acceptability of Deep Attack concepts is to see how well they support and reinforce Flexible Response. For the Europeans, doctrinal conformance to the Alliance's agreed strategy is a measure of continued US commitment to the defense of Europe and US willingness to share the risks as well as the benefits of Alliance membership.

To be consistent with Flexible Response, Deep Attack concepts must be clearly portrayed and understood as part of a strong direct defense. As such, their purpose must be expressed as defeat of less than full-scale conventional attacks and deterrence of massive conventional aggression

by making credible Alliance threats of deliberate escalation. This suggests that Deep Attack concepts must satisfy at least three conditions.

First, they must contribute to an effective forward defense of Alliance territory. Pact forces must be unable to force a political collapse of NATO, either by a limited attack or by seizure of significant territory early in a large-scale conflict. Deep Attack must contribute to a direct defense capable of providing time for Alliance authorities to reach and execute a nuclear decision. Reaching such a decision would be anguishing for all NATO nations; each will seek to assure that all alternatives short of escalation have been exhausted. Without time afforded by strong conventional forces, such a decision probably could not be reached, and the credibility of Flexible Response would be correspondingly eroded.

Second, conventional Deep Attack must not conflict significantly with NATO execution systems or procedures for deliberate nuclear escalations. In addition, it must not alter perceptions concerning NATO's means and capabilities for nuclear escalation.

Third, insofar as Deep Attack vies with NATO's nuclear systems for its development resources or political commitment, Deep Attack concepts must be seen as inextricably integrated with NATO nuclear plans and systems. Deep Attack must not be viewed as an alternative to nuclear escalation, either in war plans or in forces developed for their execution.

As concepts for Deep Attack continue to unfold, clearly they can, but not necessarily will, meet these conditions. Surely all advocates intend that their concepts strengthen NATO's conventional direct defense. But the precise contribution of any Deep Attack concept to this purpose will depend not only on funding levels, but also on the situation and conditions extant at the outbreak of hostilities. Nor need the execution of Deep Attack in a period of hostilities conflict with NATO's means and capabilities for deliberate escalation. Separate attack systems can be developed, different control procedures can be employed, and different targets can be struck.

In this regard, however, we must note that efforts to portray second- and third-generation improved conventional munitions as having effects equivalent to those of low-yield nuclear weapons constitute a two-edged sword. These portrayals support, on the one hand, the feasibility of conventional Deep Attack. On the other hand, they suggest Deep Attack's availability as a substitute for nuclear weapons. Careful examination of the characteristics of these conventional weapons suggests that they are substitutable for only the very lowest-yield nuclear

systems—the systems that, for reasons of collateral damage restraint, would tend to be employed relatively near friendly positions. By no means can such conventional systems substitute for the effect of the medium size nuclear weapons that might be contemplated for use against deeper enemy targets.

This consideration also suggests that, properly articulated and understood, conventional Deep Attack concepts cannot stand as an independent strategy for two reasons. First, the deterrent effects of the risks attending escalation to nuclear weaponry would be absent. Conventional weapons, no matter how destructive, do not convey a threat of escalation to strategic nuclear warfare. Therefore, they cannot substitute for the deterrent effect of tactical nuclear weapons. Second, the strictly military (warfighting) impact of improved conventional munitions could not foreseeably compensate for the absence of these risks. However, the improvements in reconnaissance and attack means attendant to Deep Attack have immediate application for more militarily significant deeper strikes with nuclear systems.

Strategic Pitfalls

Several pitfalls remain in developing and articulating the rationale of Deep Attack. First, we must properly describe the effect of a Deep Attack policy on the nuclear threshold. To suggest that Deep Attack will raise the nuclear threshold is to imply to some that the ultimate aim is a conventional defense. To focus on the other alternative—a lowered nuclear threshold—seems to suggest some sort of nuclear warfighting, which also raises concerns. The purpose of NATO's strategy is to deter aggression, not simply to prevent the conflict's escalation to the nuclear level. To the extent that improvements in NATO's defenses contribute to the former, they will most effectively assure the latter. Deep Attack must be viewed and addressed in precisely this perspective.

A second pitfall associated with emerging Deep Attack concepts is that they complicate the establishment of priorities. NATO's capacity to defend against a short-warning attack is eroding, and Alliance-WTO balances in the forward echelons of the battlefield are becoming more disparate. Even so, some Deep Attack advocates urge the Alliance to devote significant resources toward development of a technological capability to attack deep into WTO territory. If economic constraints did not exist, that capability, combined with greater capabilities in the first echelon, would be most welcome. But constraints do exist, and the Alliance must ask where it would most profitably apply marginal increments in resources.

Strategically, first priority must be accorded to the most dangerous threat to NATO. Currently, and for the foreseeable future, this is the capability of WTO forces to quickly break through NATO's forward defenses. As explained earlier, development of this capability has received priority in WTO defense improvements and is believed to be a prerequisite to Soviet operational strategy in Central Europe. So current and projected Alliance initiatives must aim toward denying such a capability.

The Alliance must direct its priority efforts toward blunting the attack of first and second tactical echelons of WTO forces and those operational follow-on echelons close to the forward battle. Interdiction of strategic follow-on echelons moving forward from the USSR must take a lower priority. The forward forces are already located in Eastern Europe during peacetime. They are the ones to be committed in the very early days of a conflict and the ones that pose the most immediate danger of a breakthrough. To focus too much on a more distant threat when one closer at hand is already arguably overwhelming would be sheer folly. We must take great care not to incur a strategic deficit by building for the desirable at the expense of the essential.

A third, and at least equally dangerous, strategic pitfall to the current evolution of Deep Attack concepts exists. This is the tendency of some to speak as if emerging technologies offer an opportunity to substitute deep conventional capabilities for theater nuclear forces. Technologists, in particular, favor such an approach by noting the growing accuracy of delivery systems and the increased lethality and area coverage of conventional munitions. Moreover, many defense analysts are growing disenchanted with the utility and survivability of battlefield nuclear weapons and insisting that they be eliminated wholly or in part from Alliance inventories. Together, these trends, whether intended or not, appear to argue for some level of substitution of conventional munitions for theater nuclear weapons.

Unfortunately, such a change fails to address the broader strategic requirements of Flexible Response. Conventional munitions have and will continue to become more militarily effective against many targets that were formerly vulnerable only to nuclear weapons. But the fact is, theater nuclear weapons have always had a greater purpose than military effects on the battlefield; they have been a means for achieving political results. Theater nuclear weapons threaten escalation of the conflict to a level where the costs and risks of continued aggression are clearly disproportionate to perceived gains. No matter how military effective

conventional munitions may become—and they are not yet nearly so effective as nuclear weapons—they simply cannot convey those risks.

On the other hand, the utility of battlefield nuclear systems is clearly suspect. But this is not because conventional weapons are able to replace them. The problem with battlefield nuclear systems is that they are not a credible means of threatening a NATO "first use." First, given the tactical circumstances likely to provoke an Alliance resort to nuclear weapons, battlefield systems will likely prove more devastating to territory and values of the Alliance than to those of the WTO. The FRG, in particular, has been adamant that the destructive consequences of nuclear escalation not be confined to NATO's territory. For that reason Germany has supported an improvement in longer range nuclear systems. Second, given the necessity for continuing political control of nuclear weapons, in war and peace, and the consequent restrictive release procedures, doubt has increased over whether battlefield systems are sufficiently responsive to threaten the mobile target arrays against which they are aimed. Finally, NATO's political authorities have long recognized that the use of battlefield nuclear weapons alone may not achieve either the military or the political ends sought in an Alliance "first use" of nuclear weapons.

However, we must recognize that, whatever the inherent difficulties, battlefield nuclear systems have performed a critical function. They have forced WTO forces to operate dispersed in a "nuclear scared" posture. Despite the promised development of drastically improved conventional munitions, nuclear systems still offer greater damage capabilities. Without the threat of short range battlefield systems, opposing forces would be able to concentrate with far less vulnerability, thus aggravating NATO's conventional defense problem. Moreover, these tactical nuclear systems constitute NATO's last remaining (though now dwindling) measure of nuclear superiority. They serve a vital role in deterring the Soviets from using their expanding nuclear arsenal.

Implications for NATO Strategy

Several implications emerge. First, NATO's conventional and nuclear capabilities are not separate entities but synergistic components of an effective defense posture. They are not substitutable, and deficiencies in one cannot be compensated for by improvements in the other. For that reason, conventional Deep Attack operations must be recognized as complementary, rather than as an alternative, to proposed nuclear "first use" options that rely on similar emerging weapons developments.

One such "first use" option is to direct NATO's longer range nuclear systems toward the disruption and destruction of Soviet operational and strategic follow-on echelons in transit deep in Pact territory before commitment to the forward battle. Such an option is politically useful because it would convey clearly to the Soviets NATO's ability to deny the WTO its war aims; it would also threaten subsequent and more dangerous escalation of the conflict should hostilities continue. Further, such an option meets the demanding criteria for a NATO "first use": it yields a potentially significant military return to communicate the seriousness of NATO's purpose; it signals a willingness to escalate further; and it provides for both central political control and military responsiveness of nuclear options. Finally, given Alliance deployment of Pershing II and ground launched cruise missiles (GLCM) and completion of program improvements to C^3I, NATO can achieve such a capability relatively soon.

The second implication is that NATO cannot afford to dispense with the capability to target with nuclear means the forward attacking echelons of WTO forces. This does not mean that obsolescent weapons could not be removed from Alliance inventories, or that artillery-fired atomic projectiles are necessarily the most effective means of accomplishing the objective. It does mean, however, that NATO must retain a full spectrum of nuclear capabilities to hold at risk the entire depth of attacking forces in order to assure their dispersal.

DOCTRINAL IMPLICATIONS OF DEEP ATTACK CONCEPTS

The two specific proposals for Deep Attack under discussion in the Alliance, the US Army's AirLand Battle doctrine and the SHAPE Follow-on Force Attack concept, are similar in several respects. Both recognize the significance of the Soviet forces echeloned in depth; both recognize the importance of seeing and attacking in depth; both recognize that airpower is critical for this purpose; and both recognize that this air interdiction must be more closely orchestrated to affect the ground battle. Despite these similarities, however, the two approaches are surprisingly different, both in their underlying assumptions and in their implications.

Distinctions Between the Two Concepts

Origins and purposes. The two approaches reflect their differing origins, the differing concerns of their originators, and the differing

parameters within which they were developed. AirLand Battle was developed by the US Army, with Air Force participation, for corps level and below; its purpose is to enable US forces to defeat in battle a technologically equal, numerically superior opponent anywhere in the world. Implicit in AirLand Battle doctrine is the concern that, to defeat even first echelon opposing forces, US forces must alter their approach to warfare by stressing maneuver and fighting in depth. The SHAPE concept, on the other hand, was prepared by an integrated Alliance headquarters. It deals solely with the problem of the opposing forces' reinforcing echelons theater-wide, recognizing that corps will fight according to their various national doctrines.

Allocation of airpower. AirLand Battle doctrine recognizes that a commander must be able to detect and delay or disrupt opposing forces echeloned in depth that could interfere with his operations against the enemy's first echelon. The doctrine requires that a corps strive to maintain surveillance of an area large enough to give 96 hours notice of approaching significant enemy forces; the corps must be able to influence those opposing forces up to 72 hours away from the main battle.[18] With these capabilities, the corps commander is to plan and execute battle actions to wrest the initiative from the attacking enemy force. As this planning-execution window is compressed, the difficulties and risks associated with seizing the initiative will increase accordingly. In the European theater, this 72-hour window, plotted on a map as the corps area of influence, could extend as much as 150 kilometers forward of the main battle.[19]

Some of the key procedural problems for implementing AirLand Battle in NATO are allocation of battlefield interdiction sorties down to corps and below; recognition of an area of influence beyond the Fire Support Coordination Line (FSCL), in which these sorties would be available to supplement organic corps Deep Attack systems; and early allocation of numbers of sorties to enable full integration of airpower into the planning of the ground force.

Current procedures allow for the first and are beginning to take cognizance of the second, but have made little progress in the third area. This notion of early commitment of significant air interdiction forces runs counter to the notion of centralized control of airpower and its dispatch *en masse* to the most crucial portion of the theater. Indeed, this conflict poses a key difficulty in the full implementation of AirLand Battle as it was originally conceived.

Offensive air support, including close air support, battlefield air interdiction, and reconnaissance, can be allocated down to corps level.

The ground commander's area of responsibility forward of the close battle normally ends at the Fire Support Coordination Line, approximately 25 kilometers forward. Beyond this distance, targets are the responsibility of the air component commander, though some measures are now in process to assure that air interdiction of targets to depths of 70–100 kilometers beyond the front line of engaged forces will be coordinated with the ground commander. However, procedures for planning centralized daily apportionment and allocation of air resources at the air component command and subordinate air operations centers are time-consuming. Therefore, procedures have not been developed to allocate the critical battlefield air interdiction sorties far enough in advance. This means that commanders at corps level and below have not been able to adequately integrate the principal means of deep attack—airpower—into their plans. Instead, they have been able to do little more than request air reconnaissance and air attack of certain targets. The commander generally does not know if he will receive such support until a few hours before the battle.

The SHAPE concept, on the other hand, requires no new allocation procedures. It was designed to take advantage of the very centralized air allocation procedures that cause difficulty for AirLand Battle.

Thus, there is this disjunction between AirLand Battle and the SHAPE concept: AirLand Battle thrives on the early allocation of airpower to support the ground commander, a process that reduces the extent of centralized control and application; the SHAPE concept, however, plans for more traditional use of airpower through centralized air allocation and application theater-wide. This disjunction has profound implications for how the ground war can be fought.

Contrasting Implications

Maneuver versus attrition. AirLand Battle posits maneuver by forces up to division size to seize the initiative and defeat forward enemy forces. To do this, however, the corps must have some assurance that the enemy's echeloned follow-on forces will be prevented from interfering with that maneuver long enough to allow a reasonable prospect of defeating the enemy's first echelon. Without some increased confidence that required air assets will be available to support the ground battle, it will be even more difficult and risky for the corps to assume the initiative. In this context then, the disjunction between AirLand Battle and the SHAPE concept in the allocation and application of airpower reflects the tension between a doctrine that recognizes a need to maneuver and

one that takes a more traditional (firepower and attrition) approach to the battlefield.

Warfighting versus deterrence. Alternatively, the disjunction may be viewed as a conflict of focus. At corps level and below, the focus is necessarily on warfighting; the foremost consideration must be to prevail in battle against attacking Pact forces. At NATO and region levels, the focus has been on deterrence; the Alliance must "persuade" the Soviets to call off the attack, either because they cannot win or because they cannot afford the costs of winning.

The Army's doctrine is based on the conclusion that maneuver is essential to defeat the Pact's first tactical echelon, and that this will require greater synchronization of air interdiction with ground forces than current procedures envision. But at the strategic level, air interdiction is necessarily the primary means short of nuclear exchange for attacking the Pact rear; therefore, it is an essential element of intrawar deterrence, whose contribution exceeds any materiel damage inflicted. While this deterrent perspective does not rule out greater synchronization of air and ground forces, it does constrain the amount of air resources that can be allocated to the support of ground forces. It also argues for the preservation of the centralized allocation of air resources so that airpower can be massed more easily to support theater requirements and priorities.

Immediate versus delayed impact. A third difference between these two Deep Attack concepts is the time each requires to have significant military (vice political) effect. In this context, the AirLand Battle implies a near term impact through the synchronization of air and ground forces against relatively close opposing formations. Conversely, the SHAPE concept, though currently limited by the combat radii of some NATO attack aircraft, may portend greater weight of attack at greater depths to achieve, perhaps, more significant effects at a somewhat later time.

During an acute crisis, more immediate military needs would tend to receive priority. Faced with the choice between the interdiction of opposing forces still more than 3 days from the battle or the staving off of a breakthrough in the Central Region, the commander would presumably opt to trade future security for present survival. This consideration does not negate the desirability of possessing the capability to strike very deep. But it argues for the necessity of developing the most effective procedures and systems for applying airpower to influence the close battle.

Preconflict deterrence. Examination of the preconflict deterrent implications of the two concepts reinforces the foregoing consideration. To be sure, virtually all improvements in NATO capabilities will tend to strengthen the overall deterrent. But the two concepts have somewhat different impacts on what might be called the crisis stability of the deterrent. Insofar as the capability for deep interdiction is improved, Pact risks in a "bolt from the blue" or limited mobilization attack will be increased. Presumably, this will reduce Pact incentives to attack. But the reduction in Pact incentives may not be as strong in the case of a full mobilization attack. For such an attack, the Pact could bring forward its major formations before the onset of hostilities, negating the full impact of a Deep Attack concept. AirLand Battle, however, would be significant against either a limited or a full mobilization attack because it threatens the destruction of the opposing force echelon in contact.

Impact on NATO doctrine. Finally, we must note that since AirLand Battle doctrine was not designed specifically for the NATO context of separate national corps, its implementation within the Central Region poses unique problems. These problems are distinct from those of implementing the SHAPE concept. For example, if other nations do not employ the concept of an area of influence forward of the main battle, then the development of deep intelligence may be asymmetrical despite the best efforts at inter-Allied intelligence sharing.* Also, the air allocation system may find itself in the dilemma of either taking special cognizance of interdiction requests from US corps—normally viewed as a suboptimization of airpower—or frustrating the very procedures most likely to employ airpower to its fullest effect. Together, these considerations suggest that AirLand Battle may constitute a form of doctrinal encroachment on the procedures of the other national corps unlike that previously experienced.

*The development of intelligence is a function not only of raw data, but also of the will and desires of the commander. Despite increased quantities of raw information as a consequence of new technology and centralized distribution systems, intelligence staffs at all echelons still must analyze, refine, and interpret the data. If some corps concentrate on detailed interpretation of data out to depths of 100–150 kilometers while others focus only on the opposing forces in contact, then the clarity with which second echelon enemy units are detected and tracked will vary significantly among the various corps. This means that Army Group must work to compensate for the lack of attention-in-depth by some corps, or else those corps must change the focus of their intelligence efforts to "see" deeper. Without these compensating measures, commanders at Army Group level and above will receive relatively detailed information on enemy second echelon forces opposite US corps but sparse information on second echelon forces opposite some other national corps. This "asymmetrical" intelligence would inevitably be harmful to effective coordinated operations above corps level.

Reconciling the Two Approaches

Must we choose between these distinct approaches? Should both proceed independently? Can they in some way be combined? The AirLand Battle and SHAPE concepts seem to have both complementary and competitive aspects. Certainly their differing implications with regard to warfighting versus deterrence, the time periods required for military impact during conflict, and preconflict deterrence appear mainly complementary. But the actual wartime allocation of resources for their various purposes might be competitive. And the difference in the implied locus of control of air assets implies alternative approaches to warfighting that are definitely competitive. The tendency of the AirLand Battle doctrine to infringe on other national corps-level doctrines also requires careful consideration.

These complementary and competitive aspects may be examined against three obvious standards. First, can the two different approaches be made procedurally compatible, so that the theater commander may employ either or both simultaneously? Second, can AirLand Battle be fitted into the NATO national corps approach as one nation's battle doctrine? Third, is the military hardware to implement these approaches similar and compatible, or will the theater commander's flexibility in wartime be curtailed by procurements underway today?

Procedures. At present, the centralized daily air allocation procedures clearly restrict the employment of AirLand Battle in Europe. Fortunately, efforts appear to be underway in US circles to deal in part with the air allocation issue. Army and Air Force authorities coordinated a modification of existing air allocation procedures, entitled "Joint Air Attack of the Second Echelon," in December 1982. Under these modified procedures, a Battlefield Coordination Element would operate at the Tactical Air Control Center to prioritize the Army air interdiction requests and insure Air Force appreciation of ground maneuver requirements.

This modification and the recent Air Force decision to endorse AirLand Battle doctrine represent very positive steps. But we still must transform these agreements into operating procedures within the theater and demonstrate their adequacy, especially their timeliness. In particular, various types of early allocation systems need to be explored carefully. These systems should aim at providing the flexibility to balance US doctrinal requirements at corps level and below with Alliance operational necessities at Army Group level and above.

Doctrine. Only initial measures have been taken to examine the significance of the doctrinal encroachment problem within NATO. The continuing discussions of doctrine at various national, service, and field command levels, should carefully explore the area of influence concept and revised air allocation procedures in the context of European exercises and follow-on discussions. In particular, US corps initial areas of influence should be developed based on both general guidelines and specific terrain features, road nets, and enemy capabilities; how these areas will affect other national corps should be examined.

Another area for attention is the development of intelligence forward of the FLOT in the sectors of non-US corps. Compensatory efforts at Army Group or ATAF level may be required to assure a balanced interpretation of the battlefield beyond the Fire Support Coordination Line.

Finally, we should analyze representative ground maneuver plans with regard to available air interdiction support. We must strike the right balance between providing adequate air interdiction to support the ground commander's scheme of maneuver and assuring that air allocation achieves the most decisive effects theater-wide. As yet, it is too early to determine whether the SHAPE and AirLand Battle approaches can be harmonized to achieve this balance.

Materiel. The two approaches diverge somewhat in their implications for development and acquisition of materiel. Both are somewhat ambivalent with respect to the extent of their reliance on anticipated technological advancement and future procurement. The SHAPE approach requires area surveillance, target acquisition, and attack systems of somewhat greater range while AirLand Battle does not require systems capable of the longer ranges. But AirLand Battle might entail greater attention to tactical C^3, ground mobility, and logistic preparation of the battlefield to support more maneuver oriented warfare and greater air-ground synchronization.

Although both AirLand Battle and the SHAPE concept claim to be viable with current weapons and technologies, official and press discussions of them constantly refer to the opportunities afforded by enhanced technologies. Most of these references are to area surveillance, target acquisition, and attack systems still in development and not expected to be available in significant numbers for another 5 to 10 years. Moreover, very complex developments in all functions—surveillance, information processing and dissemination, munitions, and weapon systems integration—must come on line successfully before their synergistic effect

provides the anticipated quantum leap in operational capability. And this increased capability is required for some of the advanced concepts of Deep Attack (especially those involving attacks against units as opposed to fixed facilities) to work to full effect. Given the procurement costs, technological uncertainties, time lines, and interservice issues involved, it is a high-risk force development process.

One of the greatest dangers is becoming too enchanted with the future potential of emerging technology. We must continue procurement of proven systems and incremental upgrades necessary to carry us through until new systems are available; and we must not build current plans, strategy, and tactics as though potential capability already exists.*

The materiel and force development implications of AirLand Battle and the SHAPE concept are competitive but not necessarily incompatible. While no choice between these two doctrinal approaches seems otherwise required yet, we must, at this early stage in the development of Deep Attack systems, consider the problem of doctrine and its relationship to force structure and materiel development. We must directly confront the desirability of attacking very deep with non-nuclear systems. Otherwise, we may inadvertently set our sights on capabilities whose expenses and technical difficulties compound rather than ease the more immediate challenge of strengthening NATO's forward defense.

In any event, assuring that systems developed for deep interdiction are capable of addressing immediate crises of the close battle is critical. At the same time, having the capability to see and attack strategic follow-on echelons will be useful. And we will always need intelligence and command and control capabilities to allow timely choices between battlefield needs. What we must avoid at this stage are procedures or procurements that lock us into either approach. Much additional analysis and careful consideration of the strategic and doctrinal implications of the concepts must precede firm choices.

As this review of the implications of the two Deep Attack concepts has shown, the SHAPE and AirLand Battle approaches are at least as distinctive as they are similar. A choice between the two at this juncture would obviously be premature. However, the most careful consideration of their differing implications, and consequent measures to harmonize these approaches, is warranted now. Otherwise, NATO may find itself less interoperable and rationalized a decade hence than it is today, with

*Key technology and development programs are treated in some detail in appendix A.

enormous resources having been invested in measures lacking the flexibility to meet the most urgent problems of the Alliance in crisis or conflict.

THE SOVIET DIMENSION

The open press here and abroad has given AirLand Battle, the SHAPE concept, and Deep Attack technologies prominent treatment. Undoubtedly, the concepts will have excited considerable attention among Soviet defense planners. This chapter examines these developments from the point of view of a Soviet planner assessing their implications for his own forces and doctrine. It identifies current Soviet force development trends and possible future countermeasures relevant to the two concepts, evaluates their potential effects, and reaches conclusions regarding likely Soviet actions and their consequences for the WTO.

Soviet Perception and Assessment

The Soviets are likely to see the AirLand Battle doctrine as a US attempt to move away from an essentially linear, attrition oriented defense. They will see it as emphasizing offensive action and maneuver warfare, and as an attempt to move the focus of combat action into East European (Warsaw Pact) territory. They may see little new, however, in the concept of deep attacks by air and missile forces—something that has characterized NATO operational planning for many years. AirLand Battle's emphasis on offensive maneuver and Western debate over its role in an essentially defensive alliance could heighten Soviet concerns about the possibility of NATO ground maneuver forces attacking through gaps in Pact lines to engage second echelon forces moving in more vulnerable formations.

The Soviets almost always credit the United States and NATO with capabilities that actually are only in some early stage of consideration or development. They also credit the United States with far greater capability to work its will in NATO than it usually has. Therefore, although Soviet analysts probably will recognize important limitations in US and NATO capability to implement Deep Attack concepts fully in the near term, they will probably take AirLand Battle doctrine and Deep Attack seriously and, in some cases, exaggerate both the intent and the capabilities involved.

In terms of its immediate impact, the Soviets probably will see a substantial gap between the newly published US doctrine and current theater-wide Alliance capability. The Soviets could reach the following conclusions:

- Because the ability to seriously delay or degrade Pact second echelon forces (as opposed to damaging fixed targets) using conventional weapons is based substantially on target acquisition, command and control, and weapon systems that have not yet entered US inventories, it is a doctrine that, for the present, even US forces have only limited capability to carry out. In addition, differences among the capabilities and doctrines of NATO air forces will further impede implementation of Deep Attack concepts aimed at integrating the interdiction campaign and the close battle.
- Because NATO forces have few operational reserves and are thinly spread along the entire front, NATO will not have the forces necessary to conduct large-scale maneuver attacks into the Pact rear areas. Pact forces, given their size and depth, probably can deal effectively with the smaller-scale attacks that NATO could mount.
- Because AirLand Battle is, for the present, a unilateral US doctrine applicable to corps level and below, it could not radically alter the character of battle along the entire front, which is manned predominantly by forces of other nations, for some time.

Nonetheless, the Soviet response will likely be ambivalent. Just as others do, the Soviets tend to interpret US and NATO military developments from the perspective of "worst case" assessment. Whether this is because they believe the worst case may occur or because the approach offers them leverage in extracting the maximum share of resources from their own leadership and from their WTO allies is not known. We are likely, therefore, to see public Soviet expressions of concern and, at the same time, expressions of confidence in their continuing ability to deal NATO "aggression" a "crushing defeat." We will have to discern the real impact of these new US and NATO initiatives from changes, or lack of changes, in ongoing WTO force development efforts.

The Soviets likely will conclude that they still, for the present, possess decisive advantages on the battlefield. These advantages stem from the considerable numerical superiority they continue to enjoy, coupled with recent advancements in the technology and structure of their fielded forces and what they regard as the superior moral and fighting qualities

of their troops. Thus, they probably will not see any urgent need to alter radically their ongoing efforts to modernize equipment and improve their force structure.

In the long run, however, the WTO probably sees AirLand Battle, Deep Attack concepts, and especially several important new Western technologies as very threatening developments. And they are likely to adjust operational planning, force development, and preparation of the battlefield to meet the challenge of evolving Western doctrine and technology. The Soviets are likely to be particularly concerned about the potential for new doctrine using new technology to destroy large armored formations anywhere on the battlefield, shallow or deep. This would defeat the mainstay of their strategy: the powerful armored columns essential to a high tempo of attack, quick breakthrough, and deep exploitation.

The Soviets are likely to mount a major political-propaganda campaign. They will aim to gain time and perhaps forestall general NATO acceptance of the new doctrine and acquisition of at least some of the new weapons technology. They will also try to create opportunities to exploit politically the inevitable dissension within NATO that attends even modest reexamination of programs, plans, or strategy. This effort probably will fall within the overall context of the Soviets' continuing campaign to forestall deployment of new NATO intermediate range nuclear forces. It will focus on what the Soviets will characterize as a renewed and expensive arms race, the destabilizing effects of the doctrine and the new technology, and the potential—according to the Soviets—for raising (rather than lowering) the potential for war and its ultimate escalation to the nuclear level.

Current Trends and Possible Countermeasures

Both AirLand Battle and the SHAPE concept depend considerably on attacks against deeply echeloned WTO forces in order to gain battlefield advantage. Both also seek advantage through closer integration of this interdiction effort with the close battle involving first echelon forces. And both recognize that for the foreseeable future NATO air forces will constitute the principal means for such attacks.

Both approaches seek to achieve their effect principally by isolating first echelon enemy forces on the battlefield. This will maintain a combat ratio between engaged forces that will not allow the WTO to maintain the high tempo of attack and the early decisive breakthrough that its strategy demands. With this in mind, there are four generic categories of

response, any one or combination of which would work against both AirLand Battle and the SHAPE concept.

Add combat power to the first echelon. The Soviets could increase the combat power of their first echelon in one of three ways. They could reallocate units from the second echelon (i.e., place more divisions forward); they could increase the strength of existing units across the board through changes to organization and equipment; or they could place more Soviet, vice East European, divisions in the first echelon.

Considering current WTO organization and operational doctrine, 20–25 divisions probably would be in the first echelon of an attack against NATO's Central Region.[20] Almost half of these divisions are likely to be East European. Analysis of the terrain in Western Europe, however, suggests that this region would support well over 30 divisions in the first echelon. To increase the combat power of their first echelon by at least 20 percent, therefore, the WTO need do little more than change operational plans. This option is a relatively quick fix. The forces are available in the more than 50 WTO divisions already located in Eastern Europe in peacetime; so no more forces from the USSR would necessarily be required, and the WTO would suffer no substantial mobilization or movement time penalty.

Alternatively, the Soviets could put more of their own divisions in the first echelon. Soviet divisions are substantially more powerful than those of their East European allies; they have more modern equipment and heavier tables of organization and equipment. This option, however, would necessitate some advance movement of divisions from the western USSR.

Adding combat power to the first echelon would impose some penalties on the WTO. It would require greater concentration of forces than current Soviet doctrine regards as prudent when faced with the prospect of nuclear escalation. It would put more WTO forces within range of the bulk of NATO's weapons. It would boost NATO's aircraft sortie generation capability due to reduced turn-around time, and would enhance NATO's ability to avoid WTO air defenses by using stand-off weapons. It also would complicate the WTO logistic problem and probably would force the Soviets to revise their existing efforts to make advance battlefield preparations for routes of advance, logistic stocks, and so forth. Finally, it would require substantial reworking of plans for employment of second echelon forces—in essence, a fairly fundamental review of operational concepts.

Another way to increase the first echelon's combat power is to field more capable weapon systems or make organizational changes that add more weapons to existing units. Indeed, the WTO has been doing both in the past few years and might be able to increase their efforts in this regard.

The Soviets have a continuing, dynamic program to modernize their ground forces, and they give priority to their forces in Central Europe. In the past few years, the Soviets have added a new generation of tanks and have substantially modified earlier generations. They also have fielded new towed and self-propelled artillery (much of which is likely to be nuclear-capable), substantial numbers of infantry combat vehicles, a new generation of antitank weapons, and close support aircraft and helicopter gunships.[21] The Soviets' East European allies, however, are modernizing much more slowly. This could cause significant weaknesses in the WTO combat forces opposite NATO's Central Region, especially if—as seems likely—the Soviets rely on Polish and Czech forces for the bulk of the combat power in the north and south, respectively.

The Soviets also have been modifying the organization of their ground forces in Central Europe. For example, the Soviets have recently increased the infantry and artillery components in armored units; and they appear to be increasing the number of tubes in at least some artillery batteries.[22]

Decrease time required to commit second echelon. A second way for the WTO to respond is to decrease the time required to commit second echelon forces. One development in this regard may be the creation of what the WTO calls an Operational Maneuver Group (OMG). The OMG appears to be a direct descendant of what in World War II was called an "operational group." Tank and mechanized "corps"—in reality, reinforced divisions—were assigned top commanders and given the best equipment; then they were used to strike quickly and deeply into the enemy rear.

Today's OMG appears to be a tailored combat formation of division or corps size, created out of the existing order-of-battle. It is intended to be highly mobile and more survivable and self-sustaining than other units. An OMG would be a heavily armored force reinforced with artillery, air assault elements, and aviation. It would follow closely on the heels of the first echelon and would be committed early, either to assist the first echelon or to get into the NATO rear area. Once in the NATO rear, the OMG's mission would be to seize important objectives, destroy operational reserves, interfere with command and control, and interrupt

whatever NATO mobilization and reinforcement efforts were underway.[23]

Improve counter-air capabilities. Counter-air improvements, or the ability to interrupt air-ground coordination through physical and electronic attacks on C³I systems, would also affect either AirLand Battle or the SHAPE concept because both depend on NATO's offensive air capability. As noted earlier, the WTO hopes to neutralize NATO airpower by conducting a series of theater-wide strategic air operations against NATO airfields, air defenses, nuclear storage, and command and control. Although anticipating heavy losses, they expect to cripple NATO airpower. And with the air reserves available from the USSR, they expect to be able to deny NATO the air superiority it requires to compensate for insufficient ground forces.

The Soviets are likely to continue, and could even increase, their recent emphasis on improving ground attack and close support fighters. In addition, the Soviets have a large and currently modernizing force of tactical ballistic missiles capable of attacks against NATO airfields and defensive missile sites, and the command and control centers so essential to planning and synchronization in both the AirLand Battle and SHAPE concepts. With both the improved fighters and the ballistic missile force, the Soviets could challenge NATO's ability to muster the number of interdiction strikes envisioned by either concept. This would be especially critical if the bulk of NATO aircraft capable of interdiction are tied up for several days trying to gain air superiority.

The Soviets have broadly reorganized their theater air defense structure. The reorganization more closely integrates the forces and operations of their strategic and tactical air defense units. They have an airborne warning and control system (AWACS) aircraft in advanced development, are fielding true look-down/shoot-down radars on some interceptors, have begun to field a new generation of surface-to-air missiles (SAMs), and are assigning more SAMs to protect their maneuver units. They also have an anti-tactical ballistic missile system in development. All of these will make penetration—especially deep penetration—of WTO airspace more difficult and costly.

Prepare the battlefield. The WTO also could do several things to facilitate rapid movement forward, support of forward echelons, defense of the rear area, and quick recovery from interdiction damage. For example, additional engineer units and prepositioned bridging and road construction and repair equipment and supplies would facilitate rapid and more dispersed movement and recovery from damage. Other measures could include advance preparation of road or rail nets to bypass choke points; advance preparation of river banks to accept rapid construction of alternate bridge crossings, perhaps in conjunction with nearby concealed stocks of bridging equipment; preparation of fords to facilitate crossing by vehicles with amphibious capability; and preparation of buried tactical pipelines to move high volumes of petroleum, oil, and lubricants (POL).

Effect of Trends and Countermeasures

Most US analyses of conventional combat with the WTO in NATO's Central Region have consistently shown outcomes unfavorable to NATO. Conventional WTO assaults lead to early reverses. The reverses require NATO to use nuclear weapons to redress tactical losses, prevent decisive breakthroughs, and demonstrate Alliance resolve to use all necessary means to defend against WTO aggression.

The early reverses seen by these analyses, and the subsequent escalation to use of nuclear weapons, are brought on by the inability of NATO's forward defense. That defense cannot match the combat power of the WTO first echelon divisions and their rapid reinforcement by closely following second echelon divisions and armies. Lacking large operational reserves of its own, NATO's quick loss of the first echelon battle is potentially catastrophic and requires immediate escalation. This conventional force inadequacy weakened the conventional leg of the triad of Flexible Response. Coupled with an increasingly unfavorable balance of theater nuclear forces and parity in US and Soviet strategic nuclear forces, this inadequacy threatened the very fabric of NATO's deterrent strategy.

Analyses of this sort led US and NATO planners to seek improvements at all levels, including some means to avoid such early losses requiring escalation. The analyses showed that WTO second echelon forces must be prevented from quickly reinforcing the first echelon. If this could be done, recent NATO gains in weaponry, command and control, air defense, and sustainability, coupled with good leadership and tactics, might enable NATO to hold its own *against the first echelon* and establish a coherent defense. New analyses incorporating AirLand Battle doctrine showed a *decent prospect* for success in the first echelon, but by no means *certain* success. It remained a dicey battle.

Thus, any WTO trends or countermeasures that increase the combat power of the WTO first echelon, unless matched by equivalent improvements in NATO's first echelon, will likely diminish the efficacy of

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either the AirLand Battle doctrine or the SHAPE concept. NATO must view with concern the recent changes in the organization and equipment of Soviet divisions and combat support units in Eastern Europe. These developments are leading to substantial increases in the combat potential of these divisions. And these divisions are opposite what will likely be the decisive theater of combat—NATO Central Region. Further, if the WTO were to increase the number of divisions committed to the first tactical echelon—which, as shown above, could be done by reallocating *existing* forces before reinforcement from the western USSR—NATO's forces could be quickly overwhelmed. Neither AirLand Battle nor the SHAPE concept would be effective.

Other countermeasures could be equally damaging to the new concepts. The Operational Maneuver Group's location close to the battle area, its considerable combat power, and its ability to move forward rapidly, make timely interdiction more difficult. This calls into question some of the underlying assumptions of time and distance in both AirLand Battle and the SHAPE concept.

Soviet counter-air capability, as well as offensive air capability, has grown in the past several years. As a result, NATO air forces will be tied up and used up in the counter-air battle, especially in the first critical days of the theater campaign. The very likely continuation of this trend is another matter of considerable concern. US and NATO aircraft modernization, deployment of the AWACS system, and improved air-to-air munitions capabilities and stockpiles have relieved NATO somewhat. But all of these have been factored into assessments that showed the near term value of AirLand Battle and the SHAPE concept. NATO hopes for more improvements through more effective reinforcement from the United States, better air-to-ground munitions, improved stand-off capability, and better battlefield surveillance and target acquisition capabilities. These hopes, however, depend on programs that either are far short of effective implementation (such as reinforcement aircraft bed-down and cross-servicing capabilities) or will not come to fruition for several more years (such as advanced target acquisition and second generation "smart" weapons). This is a highly dynamic area of competition, and the efficacy of either of the new concepts depends on the state of the competition when combat begins.

Finally, WTO measures to prepare the battlefield can have a decisive effect on what is otherwise a close calculation. NATO needs the ability to isolate the first echelon battle. Given the large WTO second echelon forces involved and the rigors of the air battle noted above, this ability is by no means certain. Additional WTO measures to facilitate

forward movement, support, and rapid recovery from interdiction damage will further stress NATO's capability to make either AirLand Battle or the SHAPE concept militarily effective. Moreover, most of these preparations are especially difficult intelligence targets. If the WTO is particularly thorough in such preparations, they may derive added confidence from this "ace in the hole."

Probabilities for the Future

The Soviets are unlikely to take any dramatic new directions in response to either AirLand Battle or the SHAPE concept for three reasons. First, most of the possible WTO countermeasures against both concepts represent a continuation of trends established over the past decade or more. Second, the Soviets probably do not regard either new concept as an urgent, near term threat. And third, the Soviets seldom make radical changes in the development of their defense programs or doctrine.

What we are likely to see are steady and determined efforts by the Soviets along established lines to improve the combat potential of their weapons and units across the board. This greater combat potential will improve their chances in the first echelon battle and their residual capability after direct combat or interdiction damage. The Soviets also are likely to focus on more offensive counter-air capabilities; improved theater air defenses, probably including accelerated development of defenses against cruise and tactical ballistic missiles; and improved theater infrastructure to facilitate movement and damage recovery.

This is not to say that the overall results of their programs will not be dramatic. A look at the cumulative effect of Soviet military achievements in the past decade shows clearly what a determined, consistent effort can accomplish. The USSR was already ahead of the United States in *numbers* of most weapon systems. In recent years the Soviets have overtaken us in the *technology level* of several fielded weapons and equaled us in many more. Now they are beginning to threaten the former strong US lead in three generic systems critical to both AirLand Battle and the SHAPE concept: fighter-attack aircraft, precision guided munitions, and surveillance and reconnaissance.[24] And the Soviets will continue to strive for and achieve advances in new technologies. They have been substantially outspending the United States in military research, development, test, and evaluation (RDT&E) for many years and are now at double US levels.[25]

Many of the countermeasures discussed here would, however, impose some serious difficulties on the Soviets and their WTO partners. All

exact money and manpower from economies that cannot spare either. During the past two decades, the Soviets have achieved a position of considerable strength relative to NATO; they have done this at the cost of economic well-being and consumer needs at home. Therefore, the Soviets probably were looking forward to relatively less need for massive military investments in the next decade. With the notable exception of planning modifications—which, in addition to their relatively low costs, might be the most effective—most of the countermeasures to either AirLand Battle or the SHAPE concept would seem to cost the WTO more than implementation of the concepts would cost NATO. Nonetheless, the past record indicates that the Soviets would pay the price rather than lose a hard-won advantage.

Indeed, the added investment burden on the WTO may prove to be a side benefit of either concept. More pressure by the Soviets on their WTO allies for increased defense spending would further strain an already reluctant alliance. This fact, and the fact of additional costs to the Soviets themselves, could provide added incentives for them to seek relief through arms limitation agreements of mutual benefit. If not, then at least the added strains on the Soviet economy, society, and political system may prove beneficial in limiting the Soviets in some other way, such as reducing their willingness to exploit opportunities that might have large resource costs.

To the extent that either AirLand Battle or the SHAPE concept diminishes the WTO's chances for a quick and decisive breakthrough of NATO's forward defense, deterrence is improved. The Soviets realize that general nuclear war would devastate their homeland as well as all of Europe. They have based their strategy for a war in Europe—a war they probably don't want any more than we do—on three objectives: deter NATO's use of nuclear weapons, overwhelm NATO's forward defense quickly, and bring about the early political collapse of the Alliance. The three are completely interdependent. The first allows the second, the second facilitates the first and the third, the third may preclude the first, and so on. But the key is the second: overwhelm NATO's forward defense quickly.

If the Soviets do not achieve the quick breakthrough that this strategy demands, then they face a serious dilemma. Nuclear weapons offer them no panacea under these conditions; the Soviets would face the same prospect of escalation and consequent devastation that guides their strategy and deters use of nuclear weapons at the outset. A prolonged war of attrition would bring to bear the superior economic, industrial, and manpower potential of the West, open severe cracks in an already

reluctant WTO alliance, and invite "periphery pecking" by other powers that have had to endure Soviet arrogance for much of the 20th century.

The Soviets are likely, therefore, to calculate that they must be able to achieve quick victory with conventional weapons if the attempt is to be worth the risk. So long as they cannot be confident of gaining a quick victory, NATO's deterrence efforts remain effective.

CONCLUSIONS

In the past several years, a number of initiatives aimed at strengthening NATO's defenses have emerged, grouped under the heading of Deep Attack concepts. These concepts focus on improving conventional defense by attacking in the enemy's rear to disrupt or delay his follow-on forces, thereby controlling the flow of enemy forces into the battle. Two concepts—SHAPE's Follow-on Force Attack concept and the US Army's AirLand Battle doctrine—have received particular attention.

Strategic Concerns

Alliance deliberations on the political acceptability and military utility of Deep Attack concepts will hinge on their strategic implications. Both the SHAPE concept and AirLand Battle doctrine have come under attack because no strategic rationale has been developed to show how each fits into the existing framework. For NATO, the strategic rationale must be centered on support and reinforcement of the existing Flexible Response strategy. Pursuing Deep Attack concepts that significantly reduce reliance on nuclear weapons creates severe problems for NATO because such a move is viewed as an attempt to "decouple," thereby undermining Flexible Response.

Support for Deep Attack concepts should not be based on the argument that emerging technology offers an opportunity to substitute Deep Attack conventional capabilities for theater nuclear forces. NATO's conventional and nuclear capabilities are not separate entities; they are synergistic components of an effective defense posture. One is not substitutable for the other, and improvements in one cannot compensate for deficiencies in the other.

In the competition for limited resources, first priority must be given to the most dangerous threat to NATO. Currently, that threat is the ability of forward-deployed WTO forces to achieve a quick

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breakthrough of NATO's forward defenses. Deep Attack concepts, then, must be directed as follows: first, against engaged forces and follow-on forces close to the forward battle; second, against more deeply echeloned forces and targets that become significant somewhat later in the battle; and last, against targets that become significant only in a war of attrition.

Tactical Deep Attack and strategic Deep Attack should be differentiated. Tactical Deep Attack—done with conventional weapons—should concentrate on enemy forces that can support a breakthrough attack and targets key to fighting the ground and air wars. These are generally up to about 150 kilometers behind the line of battle. *It would focus on warfighting,* although it would also enhance the conventional leg of deterrence. Strategic Deep Attack, on the other hand, could be accomplished using theater nuclear weapons. (Strategic Deep Attack can be at closer or longer ranges.) It should be directed principally against key transshipment points and those strategic reinforcing echelons deep in Pact territory. *It would focus on deterrence and, should deterrence fail, limiting war.*

Tactical Deep Attack, then, provides a fertile area for the key linkage between conventional and nuclear strategy. Threatening the area approximately 150 kilometers behind the line of battle and beyond with nuclear weapons will hold strategic reinforcements from the USSR at risk, and it will free conventional resources to concentrate on those WTO forces which are the most serious and immediate threat to NATO's defenses. Limiting conventional Deep Attack to tactical uses adds credibility to NATO's stated objective should deterrence fail: to reestablish NATO boundaries, not to carry the war deep into WTO territory and threaten the Soviet homeland. It provides for intrawar deterrence by denying the WTO its military objectives at the conventional level. And it also, by clearly limiting the operational depth of the war, avoids ambiguous signals and weapons employment that might either give the Soviets cause for deliberate escalation or lead them into use of nuclear weapons under the impression that they were under nuclear attack themselves.

Doctrinal Concerns

There are a number of doctrinal and procedural issues that must be resolved before Deep Attack concepts could be implemented in NATO. The theater commander's need for flexibility to allocate Deep Attack systems, primarily airpower, is most important. The commander must be able either to reinforce the battle at corps level or below (through the mechanism of AirLand Battle) or to destroy massed enemy reinforcing echelons (concentrating Deep Attack systems at theater level).

In practical application, AirLand Battle thrives on early allocation of airpower to support the ground battle; this process reduces the extent of centralized control and application. The SHAPE concept, however, plans for more traditional use of airpower through centralized allocation and application theater-wide; this reduces the corps commanders' planning window and, therefore, their ability to fully synchronize air attack and ground maneuver. This implies that the more closely Deep Attack concepts are tied to the ground forces battle plan, the earlier airpower must be allocated to a specific ground commander.

Although there are obvious differences, AirLand Battle and the SHAPE concept can be complementary. AirLand Battle seeks to integrate airpower with the ground commander's battle plan more closely than does the SHAPE concept. But that should be expected because AirLand Battle is a corps-level doctrine while the SHAPE concept applies more explicitly to theater and region levels. Since they can be highly complementary, we must avoid temptations to choose between the two. Therefore, we must avoid early commitment to procedures or procurements that lock us into either approach to the exclusion of the other.

Soviet Responses

Deep Attack concepts are designed to strengthen NATO's conventional defenses, thereby denying the WTO the quick breakthrough and deep exploitation that its strategy demands. Therefore, these concepts will undoubtedly demand considerable attention from Soviet planners. The Soviets will perceive a substantial gap between Deep Attack concepts and current NATO capabilities to carry out the concepts fully. But they will see both AirLand Battle and the SHAPE concept as potentially threatening in the long run.

The Soviets are likely to orchestrate a public campaign against the new concepts and technology to gain time; to possibly forestall NATO's early acceptance of some aspects of the concepts, and its acquisition of at least some of the technology; and to show dissension in an Alliance that shudders at the mere thought of modifying doctrine or strategy. They probably will do this within the overall context of their existing campaign against NATO's INF initiatives.

The WTO goal will continue to be a rapid breakthrough attack deep into NATO territory, forcing a political collapse of NATO before it can decide to use nuclear weapons. The Soviets will not alter this strategy because of AirLand Battle or the SHAPE concept but will continue efforts to structure their forces to achieve rapid advance rates in combat. WTO

members, particularly the Soviets, have made significant conventional force improvements in the past decade; and we are more likely to see continuing efforts in this regard than to see any substantial departure from established trends.

However, the WTO does have some options that could offset the advantages of the new concepts and compensate to some extent for the new technology. The WTO could increase the combat potential of its forward echelons by adding divisions (the terrain could support at least a 20 percent increase), by assigning more Soviet (vice East European) divisions to the first echelon, or by adding more and better equipment to existing divisions. The WTO also could increase the speed and ease with which follow-on forces could move forward and recover from interdiction damage. Some examination of all of these options should be expected, and the WTO likely will adopt at least some of these measures.

WTO strategy is to achieve a quick conventional breakthrough of NATO's defenses and inhibit NATO's first use of nuclear weapons. Any decrease in the WTO's confidence in its ability to carry out this strategy increases the risks to the WTO of a conventional attack against NATO. Thus, unless the Soviets are confident that AirLand Battle and the SHAPE concept will not work, that the new technology will not prove out or will not be acquired in significant numbers, or that they can overwhelmingly compensate for the concepts' combined effects, these developments will enhance deterrence. The Soviets, inclined in any case to be conservative planners, are unlikely to have such confidence.

APPENDIX A
WEAPON SYSTEMS CHARACTERISTICS

The destruction of enemy targets in war involves a complex sequence of events that must be conducted with timeliness and precision. As timeliness and precision improve, lethality becomes great enough to significantly reduce the enemy's ability to fight.

These sequential events may occur in a few short seconds, as in close combat; or they may take hours, even days, with variations in distances and in military and political circumstances. But the basic requirements remain the same.

1. **Detection.** Determining that something of interest is within the area of concern.
2. **Recognition.** Determining what is out there, to include as many characteristics as possible, such as location, movement, size, and vulnerabilities.
3. **Decision to attack.** Determining if and when the target is important enough to warrant expenditure of resources, based primarily on a combination of the threat it poses and target vulnerabilities.
4. **Weapons choice.** Determining which weapons to use, based on weapons availability and capability combined with target vulnerabilities.
5. **Weapons allocation.** Determining source of weapons, based on location, inventories, condition, and comparative capabilities of possessing units.
6. **Weapons transport.** Determining whether the strike will be conducted by surface or air, aircraft or missiles, etc., to put weapons in position to engage the target.
7. **Target acquisition.** Once in the target area, the delivery vehicle must acquire the target to release weapons within their effective envelopes.
8. **Weapons delivery.** The weapons must be released under parameters which allow them to engage the target.
9. **Target destruction.** The weapons must have sufficient lethality, through a combination of accuracy and power, to effectively remove the target as a threat.

Overlaying this sequence of events is the necessity for a command, control, and communication (C^3) system to distribute information vertically and laterally among the actors. Because C^3 takes place at every event in the chain, it is simultaneously the area of greatest potential payoff and greatest potential vulnerability. More than any other factor, C^3 can be responsible for enormous success when conducted well, or disastrous failure when conducted poorly. Ultimately, C^3 is the line through which leadership is exercised, and wars are won through leadership.

Research and development efforts in target detection and destruction requirements are wide-ranging but can generally be grouped into three broad categories: surveillance, information processing and dissemination, and weapons systems and munitions. Most current efforts in the first two categories are being conducted under the auspices of major joint service programs. Weapons systems and munitions are being developed in support of the major joint programs in some cases and independently in others.

The Joint Surveillance and Target Attack Radar System (JSTARS) has combined a number of service-directed efforts. The program aims to meet the Army requirement to find moving targets within the corps area of interest and the Air Force requirement to find moving and fixed targets of enemy second echelon forces.[26]

A common multimode radar system will combine moving target indication, fixed target indicating synthetic aperture radar, and real time weapon guidance capabilities. The high altitude Lockheed TR-1 aircraft will carry the system for the Air Force-wide area surveillance mission. The Grumman OV-1 Mohawk aircraft will carry a less complex version for the Army corps area mission. In addition to the image intelligence gathering mission, both aircraft can be equipped to gather and exploit signal intelligence.[27]

The initial JSTARS is not fully autonomous, but transmits data via data link to automatic data processing (ADP) and tracking hardware in several large vans at corps and theater levels. Decisionmakers in the vans then relay target assignment information via data link to the platform aircraft and to strike aircraft or surface-to-surface missiles. The radar system then continues to provide guidance information to the strikers until they acquire and strike their respective targets.[28]

Later in the decade, when microcircuits with better ADP are developed under DOD's Very High Speed Integrated Circuit and Very Large Scale Integrated Circuit programs, the decisionmaking and targeting processes may be collocated in-flight in a large "command center" aircraft. Such a system would greatly reduce vulnerability to communications monitoring or interference, but at the possible cost of greater exposure of decisionmakers to enemy force.

The Army's primary OV-1 collection platform extends the eyes of the corps. In addition, the Remotely Piloted Vehicle with Target Acquisition/Designated Aerial Reconnaissance System can be cued by JSTARS to extend the eyes

of the division and brigade beyond ground line of sight to the full range of division direct support artillery weapons.

The primary attack systems to be cued by JSTARS will be the Air Force Stand-off Attack Weapon and the Army Corps Support Weapons System. These weapons will be powered, guided dispensers, designed to carry a full range of submunitions against armor, personnel, or fixed targets. They will give targeting flexibility, and the "fire and forget" concept will reduce exposure to enemy defenses during delivery.[29]

Weapons under consideration for the Army surface-to-surface mission include the Vought T-22 Improved Lance and the Martin Marietta T-16 Patriot missiles. The Air Force is considering modified forms of these two missiles for the air-to-surface mission, as well as the Brunswick Low Altitude Dispenser and a modified form of the General Dynamics Tomahawk cruise missile. All of these would initially provide a stand-off range of 10 to 20 miles by flying a rocket boosted profile to release terminally guided submunitions over the target with appropriate kill characteristics.[30]

DOD is using an incremental preplanned product improvement (P^3I) approach to developing these weapons. They will start with pure inertial navigation system guidance and advance to more sophisticated systems like the Global Positioning System and JSTARS as conditions allow. The weapons will have modular guidance and control units, separate propulsion units, and a variety of modular payloads. This approach should allow rapid integration of improvements.[31]

Initially, these attack systems will serve a specialized role, concentrating on soft, emitting targets, such as enemy high-threat terminal and battlefield defenses like the SA-6, SA-8, and follow-on surface-to-air missile sites. The Joint Suppression of Enemy Air Defense (JSEAD) program is managing this specialized mission. In the defense suppression role, these weapons will augment the air delivered, long range High Speed Anti-Radiation Missile (HARM) and the short range Sidewinder with Anti-Radiation Missile seeker (SIDEARM), currently under late development and early procurement.[32]

Information processing and dissemination to the right places at the right times ultimately ties the sequential steps together for target destruction, thereby determining the effectiveness of combat power. Two major joint programs and numerous minor joint and service programs pursue these ends.

The Joint Tactical Fusion Program is developing automatic data processing assistance for a common service requirement to reduce/correlate available sensor data into single meaningful events, which can help decisionmakers or intelligence users to reduce tactical uncertainty.[33] The computer science goal is to develop artificial intelligence to the point that "thinking" computers will sort the glut of incoming information, evaluate the data, suggest probable actions by enemy forces, and list the best responses.[34]

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After the information is fused, it must be disseminated with necessary decisions, instructions, and amplifications to various users for differing functional applications. The Joint Tactical Information Data System (JTIDS) is the largest development program for this requirement. Information can be transmitted, using verbal, written, and graphic means that are secure and jam-resistant, to receiver terminals small enough for use by fighter aircraft and soldiers in the field. This C³I development will allow users at all levels to monitor enemy positions as well as the positions and conditions (such as fuel and ammunition state) of other friendly forces in the area. The user can selectively screen his monitoring to eliminate undesired information during critical activities. Included with JTIDS is the Army and Marine Corps Position Location Reporting System (PLRS). This system will automatically provide commanders with near real-time, precise locations of their forces on the battlefield, regardless of terrain, weather, or geographical location.[35]

The Joint Interoperability of Tactical Command and Control Systems (JINTACCS) program is developing standards and testing selected joint service tactical data systems to ensure that they are interoperable and compatible.[36]

The Joint Tactical Communications Program (TRI-TAC) is managing the joint transition of the services from their current tactical analog equipment to a modern digital communication system providing voice, data, and facsimile.[37]

Two major Air Force weapons systems under development are not being managed in direct consonance with the broad-based joint programs but will greatly enhance weapons delivery capability. They are the Surface-to-Surface Airfield Attack Missile (SSAAM) and the Low Altitude Navigation & Targeting Infra-Red System for Night (LANTIRN).

The SSAAM would be used to close enemy runways either before aircraft could launch for attacks on friendlies or while they are airborne, forcing dispersal to much more vulnerable alternate recovery airfields. Candidate ballistic missiles include variants of the US Pershing II, the French M-4, and the Lockheed Axe, which uses the Trident C-4 booster for propulsion. Range would be approximately 350 nautical miles with a 14,000-pound payload. The warhead would contain over 350 kinetic energy penetrator submunitions to be dispensed in a pattern along a runway target. Each submunition would penetrate a runway before detonation to cause an upheaval of the surface, making it time-consuming and difficult to repair. One such submunition has completed the development process by the Air Force under the name "clustered airfield defeat" munition and is being further refined as the "boosted kinetic energy penetration." Circular error probable for the submunitions is 100–150 feet, depending on target range. Dispersal pattern width is 200–500 feet, depending on dispensing altitude.[38] Assuming use of off-the-shelf hardware, development costs are estimated at $500 million, and production could begin within 4 years.[39]

This concept is believed capable of closing all hardened airfields in Warsaw Pact nations within 10 minutes. NATO would gain immediate air superiority

while conserving aircraft for other critical missions. It would require no data link and, therefore, would be unjammable. It could be retargeted before launch in less than 10 seconds.[40]

The LANTIRN system, or a Forward Looking Infra-Red system like it, will add a day/night, adverse weather attack capability to single seat aircraft by performing three basic functions:

1. Perform low-level day or night navigation and automatic terrain following, using a Texas Instruments terrain following radar and a Martin Marietta or Ford Aerospace wide field of view imaging infrared sensor.
2. Acquire, identify, and prioritize land targets, based on preprogrammed recognition criteria. Target data is then transferred to the aircraft fire control system, which will launch multiple Maverick missiles against several targets on the same pass.
3. Acquire, automatically track, and laser-designate fixed ground targets, using either FLIR imagery or visual techniques.

The terrain-following radar, FLIR, and tracking/laser-designating technology have been proven in previous systems. But DOD views the target recognizer system as a technically challenging, high-risk item, and it has been classified as an advanced development program. The recognizer has been under competitive development since early in the program, and both systems seem on track. Combined development and initial operational test and evaluation programs in late 1984 could lead to rapid production startup at that time.[41]

In the munitions category, general-purpose bombs will continue to be important and will benefit from more precise fuses plus more sturdy retarding devices, such as the air-inflatable assembly, for low-altitude releases. Glide bomb units will continue in sizes up to 2,000 pounds, with TV, imaging IR, and laser guidance. They will include low-level configurations that climb after release to acquire the target and then dive onto it. Better guidance and shaped-charge explosives will upgrade the AGM-65 Maverick in reliability and lethality.

Various tactical munitions dispensers are under development to deliver submunitions:

1. GATOR Mine disperses mixed antiarmor and antipersonnel devices to wait in the target area.
2. Cluster Bomb Units have combined-effects munitions for real-time attacks against combined armor and personnel targets.
3. Extended Range Antiarmor Munition will dispense "smart" antiarmor submunitions in the target area. When the submunition's acoustic sensor detects an approaching vehicle, it hurls an explosive above the vehicle. An infrared sensor in the explosive detects when it is exactly overhead and fires a shaped charge to create a self-forging projectile aimed at the

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heat source. If the IR sensor fails to detect a hot target against which to fire a self-forging projectile, then late in its trajectory the charge detonates in a different manner, producing a shotgun effect useful against personnel and lightly armored targets.[42]

This exploration shows clearly that emerging technology holds great promise for the future in dealing with enemy assaults. But we need to follow this path with prudence.

While the least complex surveillance systems and limited smart munitions are coming on line now, the more complex systems like sophisticated IMINT, weapons system guidance, information processing, and information dissemination are not projected to complete development until the mid-eighties; meaningful deployment will not be until the late eighties. Given the normal failures and time-consuming solutions, plus our track record of delay in search of a more perfect capability, fielding of these systems is doubtful before 1990. An even later date is likely because this modernization, unlike others, requires that all functions—surveillance, information processing/dissemination, and weapons systems/munitions—come on line successfully. Only then will their synergistic effect allow our capability to do anything more than creep ahead at the routine rates of the past.

There is a great danger in this modernization process: we may become too enchanted with the *potential* of emerging technology. First, this may make us fail to continue procurement of proven weapons systems and C^3 upgrades to carry us through any war in the meantime. And second, we may build current strategy, plans, and tactics as though the potential capability already exists. We must commit to the new systems today, but only in terms of funds for development and procurement setup. We must not commit *away* from our old systems until the new systems are truly proven capable and reliable, and are fully deployed to all using agencies.

APPENDIX B
COST IMPLICATIONS

Any attempt by NATO to upgrade its defensive posture, whether through modernization or increased force structure, will require economic sacrifices from all nations involved. Such has been the case ever since the Alliance was formed. But in the past, the European NATO countries relied heavily on US leadership and dollars to provide a credible deterrent.

Following World War II, NATO's deterrent posture was based almost exclusively on the US nuclear arsenal, with modest conventional contributions made by NATO countries. At the time this arrangement made good sense since Europeans generally were concerned with domestic economic recovery.

In the 1960s, the picture began to change substantially, at least from the US perspective. Europe had recovered economically and could start sharing more of the burden for its defense. WTO conventional forces became viewed as more of a threat, primarily because of the buildup of forces in the GDR, Poland, and Czechoslovakia. Soviet nuclear forces were expanding and, in the early 1960s, were perceived to be stronger than they actually were. This in turn raised questions about the credibility of the US nuclear forces acting as a deterrent against a WTO attack in Central Europe.

US leadership pushed for a NATO strategy that relied more on conventional defense while still retaining "flexible" options, up to and including a strategic nuclear attack by US forces on the Soviet Union should the WTO attack Western Europe. NATO adopted the Flexible Response strategy (MC 1473) in 1967. The cost of implementing the strategy still fell in large part on the United States. Efforts to coax the Europeans into paying a larger share for their own defense resulted in burden sharing arrangements, particularly with the FRG. The West Germans agreed to offset part of the costs for stationing US forces in the FRG. Another tactic used by the US government was to threaten to withdraw substantial US forces from Europe. The return of limited air and ground forces to the United States in 1968, with the promise of their rapid return to Europe in a crisis, partially carried out this threat.

While these tactics had some effect on the Europeans, they did not cause the Europeans to assume the bulk of the responsibility for their own defense. In the 1970s, the United States continued efforts to reduce its costs for European defense by establishing a series of force goals for all NATO partners. Specific areas

of modernization or force building were specified for each NATO country over each of the succeeding 5 years. The primary purpose was to give each nation a series of challenging force goals early enough so they could be included in long term budgeting processes. Some progress was made, but all of the nations continually fell short of the planned force goals. In practice, although nations agreed to the force goals, domestic politics and economics prevented them from meeting those goals.

The conventional force buildup in the early 1970s provided a shell for conventional defense. However, NATO's forward defense lacked credibility because of clearly identified maldeployment of forces and severe shortages in manpower and equipment. In 1977, NATO initiated the Long Term Defense Program to put some teeth into its forward defense posture.

One could argue that all the US initiatives ultimately were designed to force European NATO countries to bear more of the burden for their own defense. But even with these efforts, the United States was successful only in coaxing the Europeans to hold the line in defense spending during the 1970s. This was a victory of sorts because during the same period US defense spending as a percent of the gross national product (GNP) was decreasing.[43]

Generally speaking, during the 1970s, economic conditions were reasonably good for the primary NATO countries. Real GNP growth, while not as high as during the 1960s, was substantial. Unemployment and interest rates were down, and only inflation was considered high by most countries.[44] During relatively good economic times then, the United States was not successful in gaining support from the European NATO countries for any substantial real increase in defense spending as a percent of GNP.[45]

Today the United States has tabled a new initiative to strengthen conventional defenses in Europe. The efforts during the 1970s were deemed insufficient to build a credible forward defense for the 1980s. SHAPE's Follow-on Force Attack concept, according to the United States, will significantly improve conventional defenses and enhance deterrence, making war less likely. Estimates of the concept's cost vary but are roughly $9.5 billion.[46] This amounts to $1 billion for development and $8.5 billion to field and man the systems for 10 years.[47] General Bernard Rogers, SACEUR, has suggested that the concept could be paid for if NATO nations would increase their annual real growth in defense spending from 3 percent to 4 percent for each of the next 5 years.[48]

While spending on defense has been a difficult issue for the West Europeans, it is more acute now because of the prevailing economic conditions in Europe. While the rate of of inflation is decreasing in all nations, interest rates and unemployment have not yet decreased.[49] In fact, most nations, particularly the United States, are running large budget deficits; money continues to be tight and interest rates high, stifling economic growth.

The future does not look much brighter. Predictions are that interest rates will remain high and unemployment will continue to rise, peaking sometime in

1983.[50] Under the circumstances we can expect European NATO countries to attend to domestic economic problems more than defense spending against the Warsaw Pact threat.

The following table shows selected NATO countries' past performance in trying to meet the 3 percent target established in 1979 for annual real increases in defense spending. These figures give further evidence that the Europeans will have great difficulty meeting the 4 percent target.

NATO Defense Spending
Percent Change From Previous Year in Constant Dollars

Country	*1979*	*1980*	*1981*
FRG	1.8	1.9	1.9
Italy	2.6	4.9	−1.2
UK	3.0	2.7	2.1
US	3.4	4.9	5.4

Source: OSD, *Report on Allied Contributions to the Common Defense*, March 1982.

In summary, when economic conditions in Western Europe were reasonably good, European NATO countries had difficulty just holding the line on defense spending. The industrialized West is now in the middle of a deep recession. Major NATO countries are experiencing high unemployment and economic stagnation. Additional revenues are difficult to generate under current economic conditions. European NATO countries are focusing on real domestic issues, not on defense against a Warsaw Pact threat that, as viewed by the Europeans, was never as strong as portrayed by the United States and is weaker today than in previous decades. For the most part, NATO nations have not met their 3 percent goal in real growth for defense spending agreed to in 1979. They do not appear to be in a position to meet the 4 percent goal required to fund the SHAPE concept.

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