Theater Nuclear Weapons and the NATO Strategy of Flexible Response

J. Michael Legge

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Theater Nuclear Weapons and the NATO Strategy of Flexible Response

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PREFACE

In late 1978, The Ford Foundation provided grants to The Rand Corporation and several university centers for research and training in international security and arms control. At Rand, the grant is supporting a diverse program. In the Rand Graduate Institute, which offers a doctorate in policy analysis, the grant is contributing to student fellowships for dissertation preparation, curriculum development, workshops and tutorials, and a series of visiting lecturers. In Rand's National Security Research Division, the Ford-sponsored projects are designed to extend beyond the immediate needs of government sponsors of research by investigating long-term or emerging problems and by developing and assessing new research methodologies. The grant also is being used to fund the publication of relevant sponsored research that would otherwise not be disseminated to the general public.

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J. Michael Legge is on the staff of the British Ministry of Defence in London. He spent a sabbatical leave at Rand in 1982, at which time he prepared this analysis for publication.

FOREWORD

In writing any paper dealing with nuclear strategy, it is all too easy to become absorbed in the complex intellectual arguments involved, and to lose sight of two crucial factors: firstly, that the strategy of the NATO Alliance (and the possession of nuclear weapons as part of that strategy) has always been to prevent war by deterring aggression, and secondly that the consequences of the failure of that strategy could be devastation on a horrifying scale. But as the 1981 United Kingdom Defence White Paper put it: "The scale of that horror makes it all the more necessary that revulsion be partnered by clear thinking; if it is not, we may find ourselves having to learn again, in the appalling school of practical experience, that abhorrence of war is no substitute for realistic plans to prevent it." Inevitably, this report discusses what might happen in a nuclear war in terms which, taken out of context, might be taken to imply that such a war is probable or even inevitable. Those who oppose the possession of nuclear weapons by the West sometimes claim that merely having plans for the use of nuclear weapons makes nuclear war more likely. Indeed, some go so far as to allege that there are those in the West whose aim is to fight such a war. Nothing could be further from the truth. The so-called "peace movements" have no monopoly of moral concern or of the will to preserve peace. The overriding aim of all those involved in planning NATO strategy is to reduce the risk of war, both conventional and nuclear, to a minimum. There is no disagreement with the unilateral nuclear disarmers over this fundamental aim, only over the best means to achieve it.

SUMMARY

After more than a decade of comparatively little public interest in matters of nuclear strategy, the last few years have seen a resurgence of concern about the policy of nuclear deterrence that the North Atlantic Alliance has followed since the early 1950s. In Europe in particular, this concern has centered on the role of theater nuclear weapons in NATO strategy.

This report briefly examines the way in which that strategy evolved from the foundation of the Alliance in 1949 to the formal adoption of the current "flexible response" strategy in 1967, with particular reference to the role of theater nuclear weapons. It then traces the development within the NATO Nuclear Planning Group of the more detailed doctrine concerning the role of theater nuclear weapons within the overall strategy, which led *inter alia* to the decision taken by NATO in 1979 to modernize the long-range component of the theater nuclear forces.

The current flexible response strategy—a compromise between European and American interests—has been the subject of a good deal of criticism over recent years. The report examines the main arguments that have been advanced against the strategy, and considers the merits of various alternative strategies, including the proposals that NATO should adopt a "no-first-use" policy and that attempts should be made to establish a "battlefield nuclear free zone" in Europe. Particular attention is paid to the growing importance of public opinion as an influence on the future development of Alliance strategy. The conclusion is reached that, despite certain limitations, NATO is likely to adhere to its present strategy for at least the next decade.

On the basis of this conclusion, the report finally considers ways in which the Alliance's theater nuclear stockpile might be adapted to meet the political and strategic needs of the 1980s. Having examined the various political and military factors bearing on possible modifications to the stockpile, it is suggested that there is an urgent need to review the number of types of nuclear weapons based in Europe, particularly systems with a range of less than 1000 km. Improvements in the survivability of both weapon systems and of support functions (notably command, control, and communications systems) should be given a high priority, and consideration should be given to the possibility of reducing the number of warheads required for battlefield and nuclear defensive systems.

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ACRONYMS

ADM	Atomic Demolition Munition
ALCM	Air-Launched Cruise Missile
ANF	Atlantic Nuclear Force
C^3I	Command, Control, Communications, and Intelligence
CND	Campaign for Nuclear Disarmament (UK)
DPC	Defence Planning Committee (NATO)
ER/RB	Enhanced Radiation/Reduced Blast
ERW	Enhanced Radiation Weapon
FRG	Federal Republic of Germany
GLCM	Ground-Launched Cruise Missile
GSP	General Strike Plan (NATO)
HLG	High Level Group (NATO)
ICBM	Intercontinental Ballistic Missile
INF	Intermediate Range Nuclear Forces
IRBM	Intermediate Range Ballistic Missile
JSTPS	Joint Strategic Target Planning Staff (U.S.)
LRTNF	Long-Range Theater Nuclear Forces
LTDP	Long-Term Defence Programme (NATO)
MBFR	Mutual and Balanced Force Reductions
MC	Military Committee (NATO)
MIT	Military Implications Team (NATO New Technology Study)
MLF	Multilateral Force
MNC	Major NATO Commander
MRBM	Medium-Range Ballistic Missile
MRTNF	Medium-Range Theater Nuclear Forces
NDAC	Nuclear Defence Affairs Committee (NATO)
NPG	Nuclear Planning Group (NATO)
NPT	Non-Proliferation Treaty
PAL	Permissive Action Link

PGM	Precision Guided Munitions
PIT	Political Implications Team (NATO New Technology Study)
POC	Program of Cooperation (U.S.)
PPG	Provisional Political Guidelines (NATO)
QRA	Quick Reaction Alert
RV	Re-entry Vehicle
SAC	Strategic Air Command (U.S.)
SACEUR	Supreme Allied Commander, Europe (NATO)
SACLANT	Supreme Allied Commander, Atlantic (NATO)
SALT	Strategic Arms Limitation Talks
SCG	Special Consultative Group (NATO)
SEP	Selective Employment Plan
SIOP	Single Integrated Operations Plan
SLCM	Submarine Launched Cruise Missile
SRTNF	Short-Range Theater Nuclear Forces
START	Strategic Arms Reduction Talks
TNF	Theater Nuclear Forces

CONTENTS

I. THE BACKGROUND

INTRODUCTION

In December 1967, after a prolonged debate both within the Alliance and in public, NATO adopted the strategy of flexible response (or, more accurately, "forward defense and flexibility in response") to replace its former doctrine of massive retaliation with nuclear weapons in response to any major aggression—the so-called "tripwire" strategy. This change in strategy had the effect of giving theater nuclear weapons (TNW)[1] a much more central role. Although TNW had first been deployed in Western Europe in 1953, this was at a time when the United States still retained an unquestioned nuclear superiority over the Soviet Union, and theater weapons were seen essentially as a useful reinforcement of the deterrent provided primarily by U.S. strategic forces. The adoption of flexible response involved a recognition by the Alliance as a whole that, if the strategy failed in its principal purpose of deterring aggression, then nuclear weapons might be used on a limited scale to try to bring the conflict to an end without an automatic escalation to all-out nuclear war.

Also in 1967, the Alliance set up the Nuclear Planning Group (NPG), principally to involve the European members more directly in the development of NATO nuclear doctrine. Over the next ten years, the NPG undertook a series of studies aimed at defining more precisely the role of theater nuclear forces (TNF) within the framework of flexible response. However, public interest in nuclear issues had declined since the late 1950s and early 1960s, and given the NPG's natural inclination not to publicize its activities, its work attracted little attention. But the last five years have seen a remarkable resurgence of public interest in nuclear weapons in general and TNW in particular; it started with the controversy in 1977 over the enhanced-radiation/reduced-blast (ER/RB) weapon—the so-called "neutron bomb"—and subsequently focused on the Alliance's decision in December 1979 to modernize its long-range theater nuclear forces

[1]The use of the terms "theater" and "tactical" to describe nuclear weapons frequently gives rise to confusion. For the purpose of this report, strategic systems are taken as those defined as such in Article II of the SALT II Treaty; all remaining systems are regarded as theater weapons. The report deals primarily with land-based systems in the European theater. See App. A for a detailed explanation of nuclear weapon terminology.

(LRTNF) by deploying Ground-Launched Cruise Missiles (GLCMs) and Pershing II ballistic missiles in Europe from 1983 onwards.

The resultant public debate has renewed many of the controversies that had been given much attention some twenty years previously—for example, over the concepts of "limited nuclear war" and "demonstrative use." But the debate has taken place against the background of a very incomplete understanding of the way in which the NPG has sought, over the last fifteen years, to define the role of TNF in flexible response. The first objective of this report is therefore to describe the principal elements of the NPG's work to develop political guidelines and consultation procedures for the possible employment of theater forces as part of NATO's deterrent strategy, and to describe the subsequent (and as yet far from complete) attempts to modify existing forces to meet the requirements of these guidelines. To set the NPG's work in context, the report includes a brief account of the way in which NATO strategy developed in the 1950s and 1960s, leading up to the adoption of flexible response, with particular reference to the role of TNW, and also of the way in which the concerns about European participation in controlling NATO's nuclear weapons led to the formation of the NPG. This account is necessarily superficial; it is based on published material and not intended as a definitive history of this period, and it omits many important events (not least, The Rand Corporation's influential contribution to the development of U.S. policy on TNW). It should be regarded only as an attempt to assist the reader who is unfamiliar with this early period in setting the scene for the more recent work that is the main concern of the report.

The second objective of the report is to consider the possible directions in that NATO strategy might develop over the next decade, including an examination of the criticisms that have been leveled at the strategy of flexible response, possible alternative strategies, and current ideas such as the introduction of nuclear free zones and the adoption of a "no-first-use" policy. Finally, against this background, the report examines the directions in which the NATO theater nuclear stockpile might be modified, both to meet the requirements of the guidelines developed by the NPG since 1967 and to take account of possible future developments in doctrine and technology.

NATO STRATEGY: THE EARLY YEARS

When NATO was founded in 1949, the centerpiece of the Treaty was contained in Article V, in which the parties agreed "that an armed attack against one or more of them in Europe or North America shall be considered an attack against them all," and that if such

an attack took place, each party would "assist the Party or Parties so attacked by taking forthwith, individually and in concert with the other Parties, such action as it deems necessary, including the use of armed force, to restore and maintain the security of the North Atlantic Area."[2] However, the only significant military strength then based in Western Europe consisted of the occupation forces in Germany and Austria; moreover, the Soviet Union had broken the United States monopoly of atomic power in September 1949. Consequently, the Alliance had neither the forces nor any agreed operational doctrine to give substance to the pledge of Article V.

Within a matter of months, moving with remarkable speed, the Allies agreed (in January 1950) on a strategic concept based on the maintenance of a substantial conventional force structure capable of providing an effective defense against an attack by the Soviet Union. The Allies also established (in September 1950) the principle of an integrated military force to be set up under centralized command. An important component of this original strategic concept, which has survived through all the subsequent changes, was the principle of "forward defense"—that is the defense of NATO territory as far eastward as possible. Nevertheless, only 12 Western divisions were then immediately available on the central front, facing about 100 Soviet divisions. The outbreak of the Korean War in June 1950 temporarily distracted the West's attention from the problem of how to resolve this disparity between strategy and the means to implement it. But in February 1952, the Korean War having reached a virtual stalemate, the Allies agreed, at a crucial North Atlantic Council meeting in Lisbon, to adopt a "force goal" of about 100 divisions[3] to be achieved by 1954 in order to give substance and credibility to the strategic concept.

Almost all the Allies duly announced ambitious rearmament programs including increased defense budgets, formation of new divisions, and lengthening of periods of compulsory military service. But by 1954, even taking account of the accession of Greece, Turkey (1952),[4] and the Federal Republic of Germany (1954), it was clear that the Alliance had neither the economic strength nor the political will to come anywhere near meeting the Lisbon goals. At the same time, the United States was rapidly expanding its nuclear capability beyond the modest stockpile of Hiroshima-type bombs available when

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[2]See *NATO Facts and Figures*, App. 2, NATO Information Service, Brussels, 1978.

[3]The goals were actually 50 divisions in 1952, 75 by 1953, and 96 by 1954, of which about half were to be immediately available (25 to 30 on the Central Front) and the remainder in reserve.

[4]The original strategic concept was updated in December 1952 to take account of the accession of Greece and Turkey.

the Alliance was formed. The availability of smaller, more efficient nuclear weapons, the explosion of the first fusion (hydrogen) bomb in 1952, and the existence of long-range bombers capable of delivering these weapons deep into Soviet territory all contributed to the Eisenhower administration's reexamination of U.S. defense policy in 1953, known as the "New Look." The consequences for Alliance strategy were laid out by Secretary of State Dulles in a statement to the Council on Foreign Relations on January 12, 1954, when he formally unveiled the doctrine of "massive retaliation."

Dulles made it clear that in the future the United States would follow a policy of *nuclear deterrence:* It would seek to deter Soviet aggression by having "a great capacity to retaliate instantly, by means and at places of our own choosing." Although it was not made clear precisely what form of aggression would trigger this massive retaliation, it was implied that a wide variety of attacks could be expected to meet with a very severe response. A Presidential Directive to the U.S. Joint Chiefs of Staff (NSC-162/2) informed them that they should plan to use nuclear armaments of all types whenever this would work to the advantage of the United States. While conventional forces would still be maintained in substantial numbers in Europe to respond to local acts of aggression (the "shield"), their primary function was to contain the attack until the nuclear "sword" wielded by the United States struck down the aggressor.

Under this policy, the first nuclear weapons intended for a tactical rather than a strategic role were deployed to Europe in the autumn of 1953, although it would appear this was done on the initiative of the United States rather than as a result of a collective Alliance decision. The North Atlantic Communique of December 14-16, 1953, refers to "the continuing provisions of modern weapons of the latest types to support the NATO defense system."[5] However, the deployment of these weapons would seem to have been regarded only as a reinforcement of the deterrent, which depended essentially on the threat of massive response at the strategic level, and not as central to the strategy itself.

The Dulles speech provoked something of a stormy reaction and the policy he proposed subsequently underwent some refinement and modification, but its essential character remained. Despite the apparent disincentive provided by a massive response strategy to the maintenance of substantial conventional forces, the Allies (including

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[5]The first direct reference in NATO Communiques to the deployment of nuclear weapons as such does not appear until the Paris communique of December 16-19, 1957. However, it is clear from the synopses provided in the collected "Texts of Final Communiques, 1949-70," published by the NATO Information Service. that the phrase "the most modern weapons" is a coded reference to nuclear weapons.

the U.S.) continued to strive to improve these forces, albeit at a level considerably below the Lisbon goals. These reached a peak, prior to the withdrawal of substantial French forces for service in Algeria, of about 25 combat-ready divisions with a further 25 in reserve. But by the end of 1954 the Alliance, by switching the emphasis of its force goals from numerical increases to qualitative improvements in equipment and training, had effectively embraced the new U.S. doctrine. Indeed, it was a doctrine that had considerable attractions for the Europeans; the American nuclear sword offered the prospect of deterring Soviet attacks on Western Europe without the need for maintaining conventional forces at a level that was seen as politically and economically unrealistic.

Nevertheless, the Alliance moved more slowly than in its early days; although Ministers accepted in December 1954 that the future security of the Alliance would depend on nuclear weapons (at the same time reducing the requirement for first-line divisions down to 30) and agreed that military planning should take account of the possible use of TNW, it was not until December 1956 that NATO agreed to change its original strategy. By the endorsement of Military Committee Document 14/2 (known as MC 14/2),[6] it then formally adopted the doctrine of massive retaliation. Under the new strategy, the role of NATO's limited ground forces in Europe was viewed as a means of compelling an aggressor to mobilize for an attack, thereby giving NATO advance warning, and if he did attack, holding him as far forward as possible until nuclear retaliation could take place. The strategy thus became widely known as the so-called "trip-wire," although the term was officially repudiated at the time. It was embraced with particular enthusiasm by the United Kingdom, where thinking had independently been moving in the same direction as in the United States and for essentially the same reason—to save money. The high point of U.K. support for the strategy was seen in the 1957 Defence White Paper of Defence Minister Sandys, although Sir John Slessor had advocated such a policy several years earlier.

But even by the time MC 14/2 was formally adopted, events were conspiring to undermine its credibility. The Soviet Union had tested hydrogen bombs in August 1953 and was known to be developing both long- and medium-range bombers comparable to the B-47 and B-52 (the Bear, Bison, and Badger) and a growing intermediate range ballistic missile (IRBM) capability. Then, in October 1957, the launch of

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[6]The fact that the key documents on NATO strategy have been issued in the Military Committee series rather than as North Atlantic Council documents is a historical anomaly, dating back to the original strategic concept paper of 1950. In practice MC 14/3 (the current strategy) is an essentially political document that did not become effective until subjected to Ministerial scrutiny and endorsement.

the Sputnik earth satellite made it clear that the Russians were well on the way to acquiring intercontinental ballistic missiles (ICBMs). Such missiles could deliver devastating nuclear strikes against the United States, and there was no known defense against them. Once this capability had been realized, any threat of massive retaliation against Soviet aggression could be met by a counterthreat to destroy American cities. Moreover, it had already been recognized within the Alliance that massive retaliation, because of its lack of flexibility, was inherently unsuitable to deal with lower level threats of aggression.

One effect of these developments was to turn the spotlight on the Alliance's theater nuclear weapons. These weapons had originally become possible as a "spin-off" from the development of fusion weapons, and to NATO's military commanders they represented a means of offsetting Soviet military superiority and, indeed, of achieving military victory. Field-Marshal Montgomery as Deputy SACEUR, in a lecture to the Royal United Services Institute, was quite specific about the plans for the use of nuclear weapons: "It is no longer: 'They may possibly be used.' It is very definitely: 'They will be used, if we are attacked.'"[7] General Gruenther, SACEUR, made it clear that the weapons were seen as a substitute for conventional forces: "If 70 divisions, for example, are needed to establish a conventional line of defense between the Alps and the Baltic, then 70 minus x divisions equipped with atomic weapons would be needed."[8] (It is worth noting here that the pronouncements of the NATO military authorities at that time carried much more weight in shaping Alliance policies than they do today; the first four holders of the post of SACEUR—Generals Eisenhower, Ridgway, Gruenther, and Norstad—were not seriously challenged by the civil authorities.) The European Allies appeared to be content to accept such a policy, on the basis of three assumptions: that it represented an underpinning of the primary deterrent threat of use of U.S. strategic nuclear weapons against the Soviet homeland; that the weapons would be available for use against massed Soviet forces before they reached NATO territory; and that there was no prospect of a response in kind against Allied forces.

But the progress of the Soviet Union in equipping its own forces with nuclear weapons had put these assumptions into question, and European concerns about the possible consequences of a nuclear war in Europe were growing. Two "war games" conducted in 1955, "Sagebrush" set in Louisiana and "Carte Blanche" in Western Europe, only served to increase this concern. Carte Blanche in particular had a major impact on the European public and above all, the West Ger-

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[7] *Journal of the RUSI*, November 1954.
[8] Reported in *The New York Times*, January 18, 1954.

mans. Its purpose was partly to reassure public opinion of NATO's determination to maintain the integrity of Alliance territory, and for this reason the results were made public. In a somewhat artificial scenario, some 355 weapons were "used" against military targets, mostly on German territory, with the result that civilian casualties were estimated at about 1½ million dead and 3½ million wounded. Not surprisingly, publication of these figures aroused widespread fears about the consequences of NATO nuclear strategy, and stimulated European desires to have a greater say in developing that strategy. The stage was set for two interrelated debates that were to preoccupy the Alliance for the next ten years: How should NATO strategy, and in particular the place of nuclear weapons within it, be modified to take account of the new force relationship between East and West; and what voice should the European Allies have in the control over nuclear weapons?

THE DEVELOPMENT OF FLEXIBLE RESPONSE

As with massive retaliation, the origins of the flexible response strategy lay in the United States. Under the Eisenhower administration the immediate concern about the rising Soviet nuclear capability centered on the consequences for U.S. strategic nuclear forces. The problems involved were highlighted in the "Gaither Report" on the nation's defenses commissioned by the President in 1956, and in Wohlstetter's classic article on "The Delicate Balance of Terror," which appeared in *Foreign Affairs* in January 1958. The result was general agreement, supported by both Kennedy and Nixon in the 1960 Presidential election campaign, on the need for developing a survivable strategic retaliatory capability.

This did not, however, solve the problem of how to maintain Alliance security in the European theater in the face of the continuing Soviet conventional threat. As early as 1959, U.S. Secretary of State Herter had said in testimony to the House Committee on Foreign Affairs that the President would not involve the United States in an all-out nuclear war "unless the facts showed we were in danger of devastation ourselves." The only alternative therefore appeared to be to adopt a limited war strategy—but should such a strategy be planned on the basis of a limited nuclear war or a limited conventional war? Schools of thought in favor of both options emerged; the most notable advocate of limited nuclear war was Kissinger in his *Nuclear Weapons and Foreign Policy*, published in 1957. But neither extreme, even if militarily feasible, was politically acceptable. The reaction to

"Carte Blanche" had shown that the Europeans were not prepared to contemplate large-scale tactical use of nuclear weapons, while the Alliance collectively was not willing to fund the forces needed for a credible conventional deterrent. A strategy was needed that would provide a compromise between local conventional resistance, graduated nuclear response, and massive strategic retaliation.

The first steps towards developing such a strategy had already been taken in the last years of the Eisenhower administration. In 1957, General Norstad (then SACEUR) had argued for the adoption of a limited-war capability.[9] Then, in a book published in 1959, General Maxwell Taylor, the retiring U.S. Army Chief of Staff, proposed a "strategy of flexible response" to provide "a capability to react across the entire spectrum of possible challenge, for coping with anything from general atomic war to [local] infiltrations and aggressions."[10] But it was left to the Kennedy administration to put forward the specific proposals that were eventually to lead to the modification of Alliance strategy.

President Kennedy himself foreshadowed these proposals in a special message to Congress on the Defense Budget on March 28, 1961, but they were set out in more detail by Defense Secretary McNamara, firstly to the Allies at the NATO Council meeting in Athens on May 4-6, 1962, and then publicly unveiled in an address at the University of Michigan, Ann Arbor, the following June. Like the Dulles "massive retaliation" statement eight years earlier, this latter speech caused something of an uproar, not least because it included a sharp attack on the independent nuclear capabilities of the United Kingdom and France. But it also clearly indicated a move away from the concept of massive retaliation: "The combination of our nuclear strength and a strategy of controlled response gives us some hope of minimizing damage . . . but we do not regard this as a desirable prospect, nor do we believe that the Alliance should depend solely on our nuclear power to deter actions not involving a massive commitment of any hostile force."[11] The initial reaction of the Europeans was not enthusiastic; the risk of conflict, should one occur, escalating to nuclear exchanges in Europe was clear and, as Kissinger pointed out much later, they would prefer to have a nuclear war, if one occurred, to be fought between the U.S. and the Soviet Union over their heads.[12]

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[9]See M. W. Hoag, Chap. 5 in K. Knorr (ed.), *NATO and American Security*, Princeton University Press, 1959.

[10]Gen. M. D. Taylor, *The Uncertain Trumpet*, Harper & Brothers, New York, 1960.

[11]R. S. McNamara, speech at the University of Michigan, June 16, 1962, reprinted in *Survival*, July/August 1962, p. 194.

[12]H. A. Kissinger, *The White House Years*, Little, Brown and Company, Boston, 1979, p. 219.

Nevertheless, the handwriting was on the wall; as De Gaulle was reputed to have said, "No U.S. President will exchange Chicago for Lyon." But McNamara had a difficult struggle to convince not only the Allies but also the NATO military authorities, particularly SACEUR, General Lemnitzer, who argued for the retention of 14/2. (McNamara's eventual victory was an important turning point in asserting political control over the military authorities.) It took a furthur five years and—crucially—the withdrawal of the French from the NATO Integrated Military Structure, before the Alliance finally adopted the flexible response strategy in December 1967, when the Council endorsed document MC 14/3.

The strategy set out in MC 14/3 seeks to deter aggression by the maintenance of conventional, theater nuclear and strategic nuclear forces that would enable the Alliance to respond to any attack at an appropriate level. The initial response would be direct defense, seeking to defeat the aggression on the level at which the enemy has chosen to fight. If the aggression could not be contained, the Alliance would be prepared to conduct a deliberate escalation, raising but where possible controlling the scope and intensity of combat, with the aim of making the cost and risk disproportionate to the aggressor's objectives and the threat of nuclear response more imminent. The ultimate objective, if deterrence failed, would be to convince the aggressor of the unacceptable degree of risk involved, thus causing him to cease his attack and withdraw. Finally, in the event of a major nuclear attack, NATO would maintain a capability for a massive strategic nuclear response.

Thus described, the operational implications of flexible response are obscure, in that it does not specify the precise nature of NATO's reaction to any particular attack. It has been argued that this ambiguity enhances deterrence by complicating Warsaw Pact planning. But a degree of ambiguity was also necessary in order to allow the American and European Allies sufficient scope to interpret the strategy in accordance with their own preoccupations and perspectives. Essentially, the divergence of views centered on the role of theater nuclear weapons. Under MC 14/2, TNW had been primarily an adjunct to the U.S. strategic forces (and since the late 1950s a deterrent to the use of the Soviet Union's rapidly expanding theater nuclear armory). But in MC 14/3 they now had a central role: The strategy formally recognized the possibility that if deterrence failed to prevent a conflict and conventional defense was also unsuccessful, NATO might have to resort to using TNW, quite possibly on Allied territory, in a further attempt to end the conflict by convincing the Soviet leadership that

they had miscalculated both the Alliance's will to resist and the dangers of further escalation.

Such a policy clearly entailed risk; there was widespread agreement that if deterrence failed, deliberate escalation would be extremely difficult to control once it reached the nuclear level. But both the American and the European Allies were prepared to accept this, although for essentially contradictory reasons: the Europeans because the threat to use TNW represented the best way of "coupling" the U.S. strategic deterrent to the defense of Europe, and the Americans because it offered the best hope of preventing a major land battle in Europe from escalating to an all-out strategic exchange. Nevertheless, the ambiguities of MC 14/3 needed to be resolved in at least one respect: While the forces to implement the strategy were already in being (albeit needing, as always, some improvement and strengthening), the detailed doctrine and planning to give substance to the broad strategic guidance did not exist. The means of meeting this need turned out to be closely linked with the resolution of the second problem facing the Alliance: the question of European participation in political control over nuclear weapons.

NUCLEAR PARTICIPATION WITHIN THE ALLIANCE

By the late 1950s, the Federal Republic of Germany was beginning to emerge as a significant political voice within the Alliance. Among the major European Allies the Germans, because of their geographic position and their commitment not to become a nuclear power, were most prone to nagging doubts about the robustness of the American strategic guarantee and to fears of a large-scale nuclear war limited to the European theater. Should such a war take place, the Germans could expect to bear the brunt. These concerns were also shared by some of the smaller Allies, such as Belgium and the Netherlands. The Bonn Government therefore led in seeking a voice in shaping the way NATO would plan to use nuclear weapons in such an eventuality. Similar doubts had already played a part in the British and French decisions to acquire an independent nuclear capability, but this was an option that for legal, political, and strategic reasons was not open to the Germans—nor did they want it. Nevertheless, the Americans were worried by the specter of further nuclear proliferation and therefore were receptive to the European approaches.

European concerns were heightened, and public interest was further aroused, by the emergence of a Soviet IR/MRBM capability through the development of the SS4 and SS5 missiles. The initial

NATO response to the threat posed by the deployment of these missiles was to agree in December 1957 "to establish stocks of nuclear warheads, which will be readily available for the defense of the Alliance in case of need," and "that intermediate range ballistic missiles will have to be put at the disposal of the Supreme Allied Commander Europe."[13] This may not have appeared to be a major step forward, since U.S. TNW had been based in Europe, presumably for the defense of the Alliance, for almost five years. But late in 1958 it led to the deployment of U.S. Thor missiles in the United Kingdom under so-called "dual-key" arrangements, whereby the U.S. provided the nuclear warheads, but the European host nation manned and operated the delivery systems. The positive decision to fire still lay with the U.S. President, but the host nation had an effective power of veto over the use of the missiles.[14] Although the Thors (and the Jupiter missiles deployed shortly thereafter in Italy and Turkey) were withdrawn in 1963, they were the forerunners of several other "dual-key" theater systems that were deployed in increasing numbers in the 1960s.

However the Thors and Jupiters were not deployed specifically to meet the control problem, and indeed the German Government, although it had strongly advocated the IRBM deployment as a response to the SS4/5 threat, did not wish to have the missiles based on FRG territory. This was because the FRG was sensitive to possible Soviet concerns over a German "finger on the trigger" of a system that could reach Soviet territory, and because an uproar had been created earlier by a proposal to introduce the shorter-range Matador cruise missile into the Bundeswehr. (Interestingly, the Matador was eventually introduced into service with the German forces in the early 1960s—it had been based on German soil with U.S. forces since the mid 1950s—but its replacement, the longer-range Mace, which could reach Soviet territory, was deployed only with U.S. forces until Mace and the remaining Matadors were replaced by the ballistic Pershing I.)

For these reasons, then, European concerns persisted despite deployment of "dual-key" systems. Accordingly, after three years of inconclusive debate on ways to improve European involvement in the nuclear decisionmaking process, U.S. Secretary of State Herter

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[13]NATO Council Communique, December 19, 1957, paragraph 20.

[14]Strictly speaking, the term "dual-key" is misleading. Although some of the early systems (including Thor) did actually depend on the simultaneous operation of two "keys," one held by a U.S. officer and one by an officer of the host nation, this is no longer the case with modern weapons. Under present arrangements, the U.S. deploys warheads for delivery systems owned and operated by the European allies under a Program of Cooperation (POC). However, the term "dual key" has become widely used to describe such systems and has therefore been used in this report.

proposed to the NATO Council at its meeting on December 16-18, 1960, what he described as a "new concept for the operation of medium range ballistic missiles."[15] The U.S. would commit to NATO five Polaris submarines, each armed with 16 missiles. The rest of the Allies were expected to purchase from the U.S. a further 100 missiles, either land- or sea-based, to be controlled and operated on a multilateral basis. The two elements would then be combined in a NATO deterrent force. The communique records that Ministers noted the proposal "with great interest" and instructed Permanent Representatives to study it further; the failure to "welcome" the proposal suggests that the initial European reaction was cautious if not lukewarm.

Nor was the subsequent more considered response any more enthusiastic. After two years of deliberation, the Alliance was no nearer agreement on a system for joint control. The U.S. therefore announced at a Council meeting in Athens on May 4-6, 1962, that it would indeed commit the five Polaris submarines to NATO. In some respects this was a paper transaction; control passed from the Commander of the U.S. Atlantic Fleet to SACLANT—the same officer wearing two hats —but it did affect targeting arrangements. (U.S. Poseidon missiles are still committed to NATO as a direct consequence of this decision, although the numbers involved are calculated on the basis of reentry vehicles (RVs), not submarines, and they are assigned to SACEUR instead of SACLANT.) In December 1962, as part of the Nassau Agreement, under which the U.S. agreed to supply the U.K. with Polaris missiles following the cancellation of the Skybolt program; the British Government agreed similarly to assign its strategic nuclear V-bomber force to NATO, and also the Polaris force when it became operational, save when "supreme national interests" were at stake. The Alliance endorsed the assignment of these forces, and the transfer of the U.S. Polaris submarines to SACEUR, at the Council meeting on May 22-24, 1963.

The problems lay, however, with the second element of the original U.S. proposal: the creation of a multilateral force. By 1963 this had been refined into the so-called Multilateral Nuclear Force (MLF) proposal, which called for the formation of a NATO-assigned fleet of 25 surface ships equipped with 200 Polaris missiles and manned by crews of several nationalities. Any decision to fire the missiles was to be made jointly by the U.S. and the other participants in the force. The MLF represented the culmination of a series of ideas for nuclear sharing within the Alliance that had been developed over the previ-

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[15]A comprehensive account of the debate leading up to this proposal is given in by T. C. Wiegele, "The Origins of the MLF Concept, 1957-1960," *Orbis*, Summer 1968.

ous five years, including the Gallois Plan, the European Deterrent Group, and the Atlantic Nuclear Force.[16]

The reasons for the failure of the MLF proposal have been extensively chronicled.[17] There were several practical objections to the idea; for example, it was alleged that mixed manning was impossible in practice; that the stationing of missiles on vulnerable surface ships was militarily unsound; that the force would simply duplicate the role of the U.S. Polaris force; and that the practical command and control arrangements would be unworkable. There were also concerns about the cost of the scheme. However, the crucial objection was that the proposal failed to meet the political purpose for which it was intended. It was never entirely clear whether the Europeans wanted a finger on the nuclear trigger or on the safety catch. The British and French, by developing their independent forces, had already achieved the former; the Germans, whose concerns were paramount, were probably more concerned with the latter. But the MLF would clearly provide neither. The force could only be used by some form of joint decision, and it was clear that all parties would be able to exercise a veto. The U.S. President therefore could refuse to fire the missiles if he so wished. On the other hand, the MLF (and indeed the "dual-key" systems already being deployed in Europe in increasing numbers) would represent only a small fraction of the total U.S. nuclear arsenal; even if the Europeans vetoed its use, the Americans would still have ample means to initiate nuclear conflict if they so wished.[18] After a series of bilateral discussions between the U.S. and the major European Allies, it became clear that the MLF had little support; only the Germans, whose position had been the original catalyst for the proposal, remained broadly in favor. Moreover, there was a risk that the Soviet reaction to the "German finger on the trigger" implied by the MLF could have put the Non-Proliferation Treaty (NPT) at risk, and that would have been very unwelcome in Washington. Finally, by December 1964, President Johnson decided to drop the proposal,[19] although it was not formally abandoned until the meeting between

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[16]A good summary of the main ideas current during this period is given in R. E. Osgood, *NATO: The Entangling Alliance,* University of Chicago Press, 1962, Chaps. 8 and 9.

[17]Perhaps the best account of the rise and subsequent fall of the MLF is given in J. D. Steinbruner, *The Cybernetic Theory of Decision*, Princeton University Press, 1974, Chaps. 8 and 9.

[18]The problems inherent in jointly controlled nuclear forces had been clearly set out by Wohlstetter in his "Nuclear Sharing: NATO and the N + 1 Country," *Foreign Affairs*, April 1961—well before the MLF emerged in its final form.

[19]Ironically, just before an article by the German Defense Minister, von Hassel, appeared in the January 1965 issue of *Foreign Affairs* strongly supporting the MLF (it had, in fact, been drafted the previous November).

Johnson and Chancellor Erhard a year later. All attempts to achieve a primarily operational solution to the problem of European participation in Alliance nuclear strategy having failed, attention then moved toward the possibility of a more political answer.

ALLIANCE NUCLEAR CONSULTATION: THE FORMATION OF THE NUCLEAR PLANNING GROUP

The first significant step toward giving the non-nuclear Allies a consultative role in decisions over the use of nuclear weapons had been taken at the Athens Council meeting in May 1962, when both the U.S. and the U.K. undertook not only to continue to make available to the Alliance adequate numbers of those weapons to meet the needs of NATO defense, but to consult their Allies, time and circumstances permitting, before initiating the use of nuclear weapons. To give practical effect to these undertakings, the Council agreed "to set up special procedures to enable all members of the Alliance to exchange information concerning the role of nuclear weapons in NATO defense." A year later, together with the assignment of U.S. and U.K. nuclear forces to SACEUR, the Council approved the establishment of a nuclear deputy to SACEUR, supported by a team drawn from all NATO member countries, and the participation of European officers in the U.S. Joint Strategic Target Planning Staff (JSTPS) at the U.S. Strategic Air Command Headquarters, Omaha.

With the demise of the MLF proposal, U.S. Secretary of Defense McNamara decided to build on these initial moves towards a formal Alliance consultative machinery. Even as late as the mid-1960s, the U.S. had done very little about informing the Alliance collectively about the details of the U.S. weapon stockpile, even though the weapons were by then based in six European countries and seven Allies operated "dual-key" systems. Indeed, one of the flaws of the MLF proposal was that it would have done little to involve the Europeans in the central decisions on nuclear strategy and the plans for the possible use of the weapons. McNamara, who had never been enthusiastic about the MLF (it was a State Department proposal that was widely opposed within the Department of Defense), decided that rather than mixed manning of the hardware, it would be better to "mix-man" the policy. In May 1965 he therefore proposed at a meeting of NATO Defense Ministers that, in order to give practical substance to the Athens Guidelines, a "select committee" of Alliance members should be set up at Ministerial level to improve collective participation in nuclear policy and planning and to develop a more effective consultation machinery.

McNamara was anxious to keep the group as small as possible—to four or five—partly for security reasons, but mainly because he believed that a more effective exchange of views was possible with a group of this size. However, ten Allies[20] expressed a wish to be involved (France, which opted out of the Integrated Military Structure the following year, being the only notable absentee), and an ad hoc "Special Committee on Nuclear Consultation" of all ten was set up under the Secretary General to consider further the way forward. The Special Committee set up three working groups, on crisis management, communications, and nuclear planning. The last was the crucial group (it was the only one that met at Ministerial level), and it was agreed that it should consist of five members: the U.S., U.K., FRG, and Italy (as the "big four") plus one seat for a representative of the smaller Allies. This seat was eventually filled by Turkey; Harland Cleveland, the then U.S. Ambassador to NATO, records that in the end its allocation was agreed by the Defense Ministers drawing lots![21] The official title of the Group became the "Nuclear Planning Working Group of the NATO Special Committee of Defense Ministers," although it was popularly known as the McNamara Committee. At its first meeting in Washington in February 1966, the discussion concentrated mainly on strategic forces. McNamara demonstrated that the U.S. was genuine in its willingness to consult by giving a very full and frank account of the current U.S. intelligence estimate of Soviet nuclear capabilities. This was followed by an account of how U.S. nuclear forces were planned, procured, and managed, and a discussion of the problems faced in future planning, command, and control arrangements. In total this was undoubtedly the most comprehensive briefing the U.S. had given its Allies on the management of its nuclear deterrent forces. The European response at the next meeting in London in April, which was concerned mainly with the European theater, included British and German briefings on separate studies carried out by operational analysts in London and Bonn on the use of nuclear weapons in Europe (the results of which, incidentally, generally supported the "Carte Blanche" and "Sagebrush" exercises of the 1950s).

Both Americans and Europeans were clearly impressed by the frankness and value of the consultations—both saw the process as one of mutual education—and agreed in principle to recommend to the NATO Council the establishment of a permanent group to consult on

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[20]Belgium, Canada, Denmark, FRG, Greece, Italy, Netherlands, Turkey, U.K., U.S.

[21]H. Cleveland, *NATO—The Transatlantic Bargain*, Harper and Row, New York, 1970, p. 54.

nuclear planning matters. The main problem was the size and composition of this group: McNamara was still anxious to keep it as small as possible, while the smaller European Allies were afraid of being frozen out. At a further meeting in Rome in the autumn concerned largely with this procedural issue, the group agreed to recommend a complex two-tier structure with an open-ended Nuclear Defence Affairs Committee (NDAC), which all NATO countries would be entitled to join, and a smaller Nuclear Planning Group (NPG) which would meet at Ministerial level with seven members—four permanent (U.S., U.K., FRG, Italy) and the remaining three on a rotational basis. Meetings of officials supporting the NPG would be open to all NDAC members, however.[22] These proposals were approved by Alliance Defense Ministers meeting as the Defence Planning Committee in December 1966.[23] The NPG duly met for the first time at Ministerial level in Washington on April 6-7, 1967, with the NATO Secretary General in the Chair (the then Secretary General, Manlio Brosio, had attended meetings of the "Special Committee" the previous year, but McNamara had acted as the chairman).

Although the NPG was set up primarily to deal with the problem of European participation in Alliance nuclear policy, its inception provided NATO with a means of tackling two issues that had become increasingly urgent. Firstly, eight months after the Group first met, the Alliance approved the new flexible response strategy, but, as explained above, there was no agreed detailed doctrine and planning to support the new strategy; the precise role of TNW weapons within the strategy particularly needed clarification. Secondly, the U.S. nuclear stockpile based in Europe for the defense of the Alliance had grown very rapidly during the 1960s and by 1967 totaled something over 2,000 delivery systems (mainly dual-capable aircraft and artillery systems) equipped with about 7,000 nuclear warheads,[24] but no comprehensive attempt had been made to determine whether the number and mix of weapons was appropriate to the new strategy, or to identify ways in which it might need to be modernized or amended. These two problems were to dominate the NPG's work over the next decade.

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[22]A detailed note on the composition of the NPG is in App. B.

[23]The Defence Planning Committee (DPC) was established in 1963, but since 1966 it has met at Defense Minister or Permanent Representative level to discuss issues related to the Integrated Military Structure of the Alliance. This arrangement became necessary because of the withdrawal of France from the military side of the Alliance in 1966.

[24]See App. C for a summary of the growth and composition of the theater nuclear stockpile.

II. THE DEVELOPMENT OF DOCTRINE: THE NUCLEAR PLANNING GROUP, 1967-77

POLITICAL GUIDELINES

Initial Use

When the NPG first met in April 1967, it was not starting entirely from scratch: It could build on the work done by the Nuclear Planning Working Group over the previous year. This had already confirmed the urgent need for detailed studies on the practical consequences of the use of theater nuclear weapons, both on specific military effects (for which detailed "war gaming" would be necessary to build on the various national studies carried out over the previous decade) and on the implications for the wider politico-military situation. The NPG readily agreed to set such studies in motion. From them it was hoped to develop general political guidelines for the use of TNW; to introduce effective political consultation procedures that would permit timely decisions within a framework of strict political control; and to draw conclusions about the optimum mix of conventional and nuclear forces. Even at this early stage, different European and American perspectives were beginning to emerge. The European Ministers (led by U.K. Defence Secretary Healey) were making it clear that in their view there was no point in planning to win a theater nuclear war; since deterrence was the primary purpose of TNF, the question to be answered was how those forces could best be organized for that purpose. The U.S., on the other hand, was more concerned with the implications if deterrence failed and the military utility of TNW in such circumstances.

The initial studies, which examined the possible use of TNW in various scenarios and in different geographic areas, were undertaken by individual NPG member countries. It took a year before they began to produce substantive results, but by the time of the third NPG meeting in April 1968 they were sufficiently advanced for U.S. Defense Secretary Clifford to propose that the Group should move to the next stage—the development of political guidelines for the use of TNW. It was agreed that these guidelines should deal first with the

question of possible initial use[1] of TNW by NATO, since this was the option that had been given particular prominence by the adoption of the flexible response strategy; the question of follow-on use would be tackled at a later stage. The work was again broken down into a series of separate studies to be undertaken by individual nations, dealing with the implications of various types of TNW employment—by the U.S. on "demonstrative use," by the FRG on battlefield use, by the U.K. on maritime use, and by Italy on atomic demolition munitions (ADMs or "nuclear mines").

The novel practice (for NATO) of inviting individual countries to prepare papers on separate aspects of the problem paid dividends at least in terms of speed. By the time of the next meeting these studies had progressed sufficiently far for it to be agreed that work should be put in hand to draw together the main results into a single document that would ultimately provide authoritative political guidance on NATO initial use. This work was to be undertaken as a joint Anglo-German effort, and was to draw on all the studies undertaken under the auspices of the NPG in its first 18 months, plus earlier national and NATO studies. It was recognized that, although the study would concentrate on initial use, some account would need to be taken of the possible response of the Warsaw Pact to the various initial use options available to NATO.

The resulting Anglo-German paper (sometimes referred to as the Healey-Schroeder report after the two Defense Ministers) was ready for consideration by Ministers at their next meeting in May 1969—again a remarkably rapid effort, given the complexity and controversial nature of the subject. The paper examined in detail the various options available to NATO: defensive use (ADMs or nuclear air defense); battlefield use; use in an "extended geographical area" (in other words, beyond the battlefield well into Warsaw Pact territory); maritime use; and so on. One option that attracted particular attention, not only in the NPG but in public debate, was the so-called "demonstrative use." In its extreme form this would involve the explosion of a single weapon in an uninhabited area (or over the sea) with no direct military effect, the aim being to demonstrate the Alliance's cohesiveness and determination to use nuclear weapons in its own

[1]"Initial use" is the first use of nuclear weapons at any level and against any target *by either side*. Should the Warsaw Pact be the first to cross the nuclear threshold, then any response by NATO would not be "initial use" even though it would be the first time the Alliance had used nuclear weapons. "Initial use" and "first use" are essentially synonymous, although initial use is generally used only in the context of NATO employment. It would normally take the form of a discrete package of weapons covered by a single political release authorization and be limited to a specific time period; all subsequent authorization would be regarded as follow-on use. (Also see App. A for the difference between first use and first strike.)

defense. This option did not attract a great deal of support—the 1968 U.S. paper had pointed out that an apparent reluctance to use nuclear weapons to any military effect might well be seen as a sign of weakness instead of strength of purpose—but since the question of demonstrative use has attracted some attention again recently, it is worth recording that the NPG agreed that it was a possibility that should not be ruled out, and it remains as an option for consideration by NATO should the need arise. But unlike all the other options, which would be intended to achieve some military effect, demonstrative use, for obvious reasons, does not require that formal military plans to be drawn up in advance.[2]

The paper examined each of the possible types of use in the light of various criteria that would influence the nature of any decision to use nuclear weapons—for example, the need to convey an unmistakable political signal to the enemy; to control the risks of escalation; to minimize collateral damage; and to meet the requirements of political control and Allied consultation. The essential message that came out of the paper was quite clear: Given that any initial use of nuclear weapons would result in a qualitative change in the nature of warfare, such use by NATO should have a fundamentally political purpose. It should be designed to confront the enemy with the prospect of the risks of escalation consequent on a continuation of the conflict, with the aim of making him halt his attack and withdraw, thereby restoring the credibility of the deterrent. This did not imply that initial use should not have a military objective as a means of achieving its political aim, but it did suggest that such use would need to be carefully limited, and it therefore followed that it would be necessary to maintain the closest political control over such use. Although there were no illusions about the difficulty of controlling escalation in such circumstances, or about the risks of provoking either a pre-emptive Soviet strike or a massive nuclear response, the paper clearly affirmed that the only tenable position for NATO was a gradualist one: keeping the scale of use as low as possible consistent with its basic objectives. This, of course, meant that the Alliance would be faced with a difficult balancing act between the need to convey an adequate signal while limiting the risks of escalation. These conclusions may not appear very startling now, seeing that they have gained widespread (although by no means universal) acceptance. But it must be remembered that the Anglo-German paper was drafted only a year after the adoption of MC 14/3 and represented the first Allied attempt

[2]A useful summary of the advantages and disadvantages of demonstrative use can be found in P. Buteux's "Theatre Nuclear Weapons and European Security," *Canadian Journal of Political Science,* December 1977, pp. 740-743.

to work through in detail the possible implications of NATO first use of nuclear weapons at the theater level. The basic themes developed then have stood the test of time remarkably well, and still underlie much of the Alliance's current doctrine. It must nevertheless be recognized that, although the paper went a good deal further than MC 14/3 in defining the nature of initial use, the language still retained some of the ambiguities that were necessary to mark the differences of perception between the U.S. and the European Allies.

The U.S. reaction to the paper was of particular interest. In the first place it was of some significance that it had been prepared without direct American involvement—the first and only time that a major paper on Allied nuclear doctrine has been undertaken without U.S. participation from the outset. This probably reflected a view in Washington that if the NPG was to succeed, the Europeans would have to be given real responsibility, rather than an indication that the U.S. did not take the work seriously. The most important American reservations to the report concerned the scale of initial use: The Americans were anxious not to rule out as a possible option the initial use of theater weapons on a substantial scale, perhaps running into hundreds of weapons. (This was a point on which the Germans in particular were understandably sensitive, given the possibility that many of the weapons might be used on German territory.) But this was the only significant manifestation of the views of adherents to the so-called "warfighting" school of thought—those who argue that once NATO has been driven to the point of using nuclear weapons (and bearing in mind Soviet declaratory policy, which calls for a large-scale nuclear response to any NATO use of nuclear weapons), then the primary objective of such use should be to gain an immediate military victory, at least at the local level.[3] The debate between "warfighters" and those who believed in the primacy of the "political signal" was to surface at intervals over the next decade. In the case of the initial use guidelines, however, despite reservations about the possible *scale* of use, the U.S. came down firmly in support of the view taken by the Europeans that NATO's *objective* would be essentially political and that initial use would therefore be very selective. A second point of

[3]Because the term "nuclear warfighting" has become widely used in this context, it has been adopted in this report. It would be more accurate, however, to describe this as the "nuclear war-winning" view, since apart from demonstrative use all forms of use of TNW would involve an element of "warfighting." The term is also unsatisfactory in that it can be used to cover a wide spectrum of opinion ranging from those who support the flexible response strategy but would argue that once NATO has been forced to cross the nuclear threshold it should contemplate doing so on a large scale (say 100 to 200 weapons rather than 10 to 20), through to others who advocate a policy of pre-emptive massive use in response to a major conventional attack—a "trip-wire" at the theater level.

interest concerned the treatment of the link between the possible use of nuclear weapons on NATO territory and in an "extended geographical area." Somewhat to U.S. surprise, the 1968 German paper on battlefield use had acknowledged the possibility of limited employment against Warsaw Pact forces on NATO soil, though it insisted that such use should only be an adjunct to strikes on non-Soviet Warsaw Pact territory. (This was an early indication of German fears of "decoupling"—the breaking of the link between a European conflict and the ultimate guarantee provided by the U.S. strategic deterrent.) At a meeting between the U.S., U.K., and FRG to resolve points of difference on the Anglo-German draft, it was agreed that this point should be dealt with by employing the formula that battlefield use should go "hand in hand" with use in an extended geographic area. Both sides were prepared to compromise on the question of the scale of initial use, although references to specific numbers of weapons that appeared in the original draft were subsequently dropped.

Despite the fact that over the next few months about 100 amendments were suggested to the original draft, the Anglo-German paper was generally well received by the other NPG members. The proposed amendments were taken into account in preparing a revised paper, which was presented to NPG Ministers in November 1969. The amended version, with the cumbersome title of "Provisional Political Guidelines for the Initial Defensive Tactical Use of Nuclear Weapons by NATO" (which became known as the "PPGs"), was approved by the NPG and forwarded to the NDAC and the Defence Planning Committee for endorsement, which it duly received in December 1969.[4] The word "provisional" in the title may have suggested some hesitation by Ministers to admit that the final word had been said on such an important subject, but it also reflected NPG's recognition that further work was needed on the next major question: How should the Alliance follow-on the initial use of nuclear weapons if that use had failed in its objective to persuade the Warsaw Pact to stop fighting? Although the PPGs had briefly dealt with the question of follow-on use, the various options required much more detailed study, which in turn might demand some revision of the Provisional Guidelines. However before considering the way in which this problem was approached, it is necessary first to describe a parallel strand of the NPG's early work that also came to fruition in November 1969, and which also had far-reaching implications for the Alliance.

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[4]A revised version incorporating some relatively minor amendments was approved by the DPC in 1970.

Nuclear Consultation

As already described, one of the driving forces behind the formation of the NPG had been the need to involve the non-nuclear Allies in the nuclear consultation process. At the outset the Group therefore set about providing more substance to the Council decisions taken at Athens in 1962. The first practical result was agreement to a German proposal at The Hague NPG meeting in April 1968 for an expansion of the original Athens Guidelines that the nuclear powers would consult their Allies "time and circumstances permitting." This agreement recognized that special weight should be given in the consultation process to the country on or from whose territory the weapons would be employed; to the country providing the delivery system concerned; and to the country providing the warhead (the latter provisions being somewhat superfluous, in that the decision to release the weapon or weapons could only be taken by the country owning the warhead).

It was further agreed at the April 1968 meeting that the various agreements and operational practices that had become established should be drawn together into a single set of agreed general guidelines for consultation on the possible use of nuclear weapons. Work was accordingly set in hand under Belgian leadership, and in November 1969, at the same meeting that endorsed the PPGs, the NPG approved draft guidelines for submission to the DPC. The procedures established to put these guidelines into effect are regularly practiced in the biennial NATO WINTEX "command post" exercises (that is, "paper" exercises designed to test procedures at headquarters without involving actual troop movements); as a result they have been elaborated and refined over the years, but the basic principles remain unchanged.

These procedures were summarized in a report to the U.S. Senate Foreign Relations Committee in 1973,[5] and shown in diagrammatic form (albeit not entirely accurately) in the U.S. Army Operations Field Manual 100-5. The details of the consultation arrangements are, not surprisingly, highly classified and in any event fall somewhat outside the scope of this report. However one point is worth making about the existing procedures. Various authors, using the request sequence shown in the U.S. Army Field Manual as evidence, have contended that the NATO consultation process is so complex that it would make timely release of nuclear weapons to field commanders

[5]U.S. Senate Committee on Foreign Relations, Subcommittee on U.S. Security Agreements and Commitments Abroad, "*U.S. Security Issues in Europe—Burden Sharing and Offset*, MBFR and Nuclear Weapons," December 1973.

impossible.[6] These criticisms miss the point that the Alliance consultative machinery is not mandatory without exception; it is still subject to the original Athens qualifications, "time and circumstances permitting," and means exist for short-circuiting some aspects of the process. This was implicitly recognized by the amplification of the original guidelines agreed upon at The Hague, which acknowledged that priority should be given to the views of the Allies most directly involved. Three points in particular should be noted: Firstly, the NATO Defence Planning Committee is not responsible for approving a nuclear release request submitted by a Major NATO Commander; its function is to act as a channel for conveying the views of the Allies to the nuclear power concerned. Secondly, in an actual crisis it is highly probable that Alliance discussions on the possible use of nuclear weapons would have taken place in the DPC before an actual request for release was originated. Thirdly, it is possible that, particularly in the case of initial use, the initiative could well come from the political authorities (or at least from SACEUR) rather than working its way up from corps level (so called "top-down" release). The real problem lies not with the procedures themselves, but with the requirement for the nuclear powers to retain direct political control over any release of nuclear weapons for use, and the agonizing nature of the decision for any political leader. The only way of avoiding this problem would be to give military commanders some form of preconditioned authority prior to the outbreak of war that would allow them to use TNW under certain specified circumstances without seeking further approval, but such an arrangement would, without doubt, be politically unacceptable within the Alliance. (Such evidence as is available about Soviet procedures suggests that Warsaw Pact weapons are under an equally tight form of political control.)

Atomic Demolition Munitions and Theater Strike Forces

For the sake of completeness, two other aspects of the NPG's early work merit recording. During its first three years, the Group spent a considerable amount of time considering the problem of Atomic Demolition Munitions (ADMs), which had been deployed for the first time in the mid-1960s. The advantage of ADMs is that they could be used

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[6]See, for example, W. R. Van Cleave and S. T. Cohen, *Tactical Nuclear Weapons: An Examination of the Issues*, Crane, Russak and Co., 1978, p. 58, and J. Record, *NATO's Theater Nuclear Force Modernization Program: The Real Issues*, Institute for Foreign Policy Analysis Inc., November 1981, p. 34.

to considerable military effect while limiting unwanted collateral damage by deep burial of the weapons. The main problem is that they would need to be emplaced far forward for maximum effect and therefore would have to be used at a very early stage in the conflict. This could face NATO with the risk of taking a premature decision to cross the nuclear threshold, and also the possibility that the weapons might be overrun before a decision could be taken. In addition, they need to be placed deep in the earth, often in rocky terrain, which dictates that emplacement sites should be prepared in advance in peacetime ("prechambering"). The Germans in particular have reservations about such a course, fearing how the public might react to the identification in peacetime of possible locations for nuclear explosions. The NPG's interest in the subject was largely the result of a school of thought, notably in military circles, which argued that, because of their low potential for collateral damage, ADMs should not be regarded as in the same class as other TNW, and therefore should not be subject to the same political constraints. On this basis, military commanders could be given pre-conditioned authority to use the weapons in response to a major Warsaw Pact conventional attack, thus avoiding the problem of political authorization for early use.

The initial work on ADMs was led by the Turks, who had shown a strong interest in the subject during their time as representative of the smaller NATO nations on the original McNamara Committee. This reflected the fact that ADMs have their greatest potential for use in mountainous areas where they could be used to block the few invasion routes open to an enemy, and consequently are of particular interest to the Southern Flank countries, whose land frontiers are generally guarded by mountain chains. Following a Turkish presentation at the first NPG meeting in 1967, the Group returned to the problem several times at the next few meetings, commissioning further studies into both the operational and political aspects. Although these studies were taken into account in drafting the PPGs, they were also to culminate in the preparation of a separate set of political guidelines specifically devoted to ADMs, based on work led by the Italians (who took over when the Turks relinquished their NPG seat under the rotational system). These guidelines were finally endorsed by NPG Ministers in October 1970 and forwarded to the DPC for formal approval in December 1970. The most important feature of the guidelines was their firm conclusion that ADMs were to be regarded as in the same category as other TNW, and subject to the same political control. With this issue resolved, ADMs became much less controversial; the view is now fairly widely held that, while they might be valuable in certain limited circumstances and therefore should not be entirely discarded by NATO as a possible theater nuclear option, the

problems of early release and the requirements of political control would rule out their use in the majority of cases. At one time it was hoped these problems could be overcome by the development of "earth penetrator" warheads on theater ballistic missiles like Pershing, but this option now seems unlikely to be pursued. Also, developments in high explosives may well mean that it will increasingly be possible for conventional weapons to be allocated to tasks which hitherto would have required an ADM.

The second issue that drew a good deal of attention at this time was the question of the role theater nuclear forces would play in the extreme eventuality of "General Release"—the coordinated use of all SACEUR's nuclear assets in the event of general nuclear war. Under the previous "trip-wire" strategy of MC 14/2, the role of TNF was primarily to contribute to the General Strike Plan (GSP) in support of the Single Integrated Operations Plan (SIOP) for the U.S. strategic forces; and to provide direct fire support to NATO's conventional forces; but the advent of flexible response raised the question of the extent to which some theater forces needed to be held in reserve for General Release. The problem was addressed in a joint U.S.-German study, and after several discussions at NPG meetings in 1969-70, a paper on "The Role of Theatre Nuclear Strike Forces in Allied Command Europe" was agreed at the October 1970 meeting. While this paper did not have a lasting effect on NATO doctrine, two points of interest arose during its drafting. Firstly, there was a clear emergence of German concerns about decoupling, which had begun to surface earlier during the drafting of the PPGs. This concern, by no means restricted to the Germans, was of course an important factor in the establishment of the NPG, and has been a consideration never far from the center of the NPG's continuing deliberations. Secondly, there was a confrontation with the NATO Military Authorities over the extent to which theater nuclear forces should be "reserved"—that is, deliberately withheld from use—for General Release. The Military Authorities still had reservations about the utility of limited, selective release and placed heavy emphasis on the role of TNF in General Release. The modifications brought about by the Theater Strike Forces paper represented an important step in the process of ensuring that NATO's military plans were brought into line with the strategic requirements of MC 14/3. Together with the results of successive WINTEX exercises, this process was to lead eventually to the development of specific Selective Employment Plans (SEPs) for the limited use of TNF.

FOLLOW-ON USE

Returning to the central thrust of the NPG's work, when Ministers approved the PPGs in November 1969 they also decided that it was important to set in hand further studies into the question of follow-on use. The first phase of this work was to consist of a series of analytical studies, based in various geographic regions and considering different types of use in a range of politico-military scenarios. Broad guidelines were set out for the studies: They should be based on agreed NATO strategy, assume an initial conventional attack by the Warsaw Pact followed by initial use of nuclear weapons by either NATO or the Warsaw Pact, and take account only of existing available forces and weaponry. They were intended to include, for example, consideration of the military effects of use of TNW; the options available to the Alliance; vulnerability and survivability of NATO forces; possible enemy responses, including both response at approximately the same level and at a higher level; and possibilities of limiting escalation by restrictions on areas of use, targets, yields of weapons used, types of delivery systems, and methods of employment.

In all, eight "Phase I" studies were set in hand, each being undertaken by a group of three or four countries. Not surprisingly, given the complexity of the issues involved, they took some time to complete. The first to come before Ministers were presented at the NPG meeting in May 1971 and the last in May 1973. However, it had been recognized at the outset that the results of the analytical studies would need to be drawn together in a second phase, and it was agreed that there was no need to wait until all the Phase I studies were complete to begin this work. Accordingly, at the May 1972 meeting the "Phase II" study was established to conduct a comparative analysis and synthesis of the Phase I studies, with the object of defining possible policy choices and formulating policy guidelines of a general nature. This work was undertaken by a trilateral group of the U.S. (in the chair), the FRG, and the U.K.

Although the detailed results of the Phase I studies showed considerable variations, a single underlying message emerged with remarkable clarity from virtually every study. The studies indicated that follow-on use of TNW by NATO in the form of selective strikes against Warsaw Pact forces could result in a short-term military advantage in the area concerned, and quite possibly a pause in the conflict; but if the Warsaw Pact responded with a nuclear attack on a similar (or greater) scale, neither side would gain a significant military advantage as a direct consequence of using nuclear weapons (save in some special circumstances such as using them to halt an amphibious landing). Moreover, if the Warsaw Pact were able to

resume its attack, given the advantages of numerically superior reinforcements and geographically shorter reinforcement routes, the advantage might well tilt further in favor of the East. The Phase II study was therefore irresistibly drawn to the conclusion that if the initial signal had failed adequately to convey the twin messages of NATO's determination to resist and the risks thereby involved in continuing the conflict, then the signal would have to be repeated in a more peremptory manner.

This did not mean that follow-on use should not have a military purpose; indeed it was generally acknowledged that the most effective way of reinforcing the message of initial use would be to use TNW in such a way as to exert the maximum shock and decisive effect on enemy forces. But the studies did suggest that the large-scale use of nuclear weapons against a massive Warsaw Pact attack in Europe was unlikely to produce a decisive military victory (and would also result in totally unacceptable levels of collateral damage, much of it on NATO territory). This conclusion naturally did not find favor with a segment of Alliance opinion which wished to see greater stress put on the military utility of TNW, arguing that preparedness for wide-scale use would have the maximum deterrent effect. But it was difficult to contest the conclusions of the Phase I studies (short of arguing for a massive pre-emptive nuclear strike at an early stage in the conflict, which would in effect be a return to a trip-wire strategy limited to the European theater); after two years of difficult debate, an agreed Phase II report was submitted to the rest of the Allies in July 1974. Its essential message was to endorse the view of the PPGs: Follow-on use should have the same purpose as initial use (to persuade the enemy to cease his aggression and withdraw), and the nature of the use should therefore still be selective and be designed to meet this political requirement. Like the Healey-Schroeder report some five years earlier, the paper was then subject to numerous detailed amendments as a result of discussions in the Alliance, but the basic message remained unchanged. The final report was duly considered and endorsed by Ministers at the NPG meeting in June 1975.

At this stage it was suggested that the next phase of the exercise should be widened in scope to produce a consolidated statement of NATO's concept for the use of theater nuclear weapons, drawing together in one document the policy and guidance already agreed in the PPGs, the Phase II report, the ADM Guidelines, the Consultation Guidelines, and the Theater Strike Forces paper. Although nominally an editorial exercise, this would undoubtedly be a major undertaking, offering an opportunity to reopen many of the difficult and contentious issues that had preoccupied the NPG since its inception. But two unrelated factors were now to cause this "Phase III" effort to be put to

one side in favor of more urgent work that was to mark a major shift in the emphasis of the NPG's effort.

The first of these factors indirectly arose from the Phase II report. Those who had reservations about its conclusions but were unable to shake the findings of the Phase I studies on their merits, tried to put them in doubt by questioning the assumptions on which the studies were based. One of these assumptions was that the studies should only take account of existing forces and weaponry. But, it was argued, several major technological advances were in prospect that could radically improve the effectiveness of NATO's theater nuclear forces and increase the prospect of successful military operations. A recommendation was therefore put to Ministers that there should be a study of the "new technology." Secondly, there was growing support in the U.S. Congress for the argument that the U.S. theater nuclear armory in Europe was too large and should be substantially reduced. This gave rise to an amendment proposed by Senator Nunn to the U.S. Military Procurement Authorization Act; passed in 1976, this required the U.S. Secretary of Defense to report to Congress on the overall concept for the use of tactical (sic) nuclear weapons in Europe, and in particular to assess the size and composition of the U.S. nuclear stockpile in Europe. The studies that were set in hand to meet these two requirements represented a turning point for the NPG: After some seven years of concentrating on developing a doctrine for the use of TNW, attention began to shift to consideration of the numbers and types of weapon systems needed to implement that doctrine.

THE NEW TECHNOLOGY

The technological advances that had offered critics of the follow-on use studies an opportunity to question the validity of the study results had occurred in a number of areas, notably in guidance systems (particularly for missiles); "tailoring" nuclear weapon effects; and command, control, communications, and information systems (C^3I). Two potential developments attracted particular attention: the introduction of so-called "mini-nukes," or very-low-yield warheads, which had been predicted in an article in *The Times* of London in 1973,[7] and the advent of precision guided munitions (PGMs), which were believed to have made a major impact in the October 1973 Middle East War.

The "mini-nuke" episode was in fact exaggerated out of all proportion, just as the "neutron bomb" story was to be some four years later,

[7]"Miniature Nuclear Arms Developed by Pentagon for Battlefield Use," C. Douglas-Hume, *The Times* of London, May 7, 1973.

albeit with much more far-reaching consequences. In fact, the Alliance had had the capability of deploying very low-yield weapons for a number of years and had actually done so with the Davy Crockett bazooka in the 1960s (eventually withdrawn because of command and control problems). While the advent of more accurate delivery systems offered the possibility of using sub-kiloton-yield warheads for roles that had previously demanded higher yields to achieve the same degree of effectiveness, equally it presented the opportunity of using conventional systems for tasks that had hitherto required a nuclear weapon. Fears that NATO was intending to introduce very low-yield weapons and hence "blur the nuclear threshold"[8] were thus wide of the mark and U.S. spokesmen were quick to deny both the existence of a "mini-nuke" programme and of any intention to blur the distinction between conventional and nuclear arms.[9] Nevertheless, there was a considerable public reaction to the *Times* story, and the subject was raised by German Defence Minister Leber at the May 1973 NPG meeting. At the same time, the status report from the Phase II study was drawing attention to the possibility that the outcome of the Phase I studies might need to be reconsidered in the light of technological developments. (This was not the first time that the subject had been raised in the Alliance: Shortly before retiring as Secretary General in 1971, Manlio Brosio had circulated a personal paper on "unresolved problems" in nuclear defense, drawing attention to the opportunities offered by technological advances in the nuclear area; but although the paper aroused considerable interest, it produced no concrete results.)

The outcome was that, at the following meeting in November 1973, NPG Ministers agreed to set in hand a study of the implications of new technology for NATO's theater nuclear posture, under U.S. chairmanship. The work was to be divided into two sections: a study on the military implications, led by the U.K., and one on the political implications, led by the Germans. To set it in context, U.S. Secretary of

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[8]The "nuclear threshold" is a widely misunderstood concept. As far as NATO is concerned, crossing the nuclear threshold would mean initial use by the Alliance (see footnote 1). Since NATO has no concept of a pre-emptive attack on Warsaw Pact nuclear forces, this point would be reached when the Alliance judged that continued resistance by conventional forces was no longer feasible. When the nuclear threshold is reached is thus a function of conventional strength and not of the nuclear weapons available (and "raising the threshold" is accordingly dependent on strengthening conventional defenses). While the characteristics of those nuclear weapons (notably those which permit reduced collateral damage) might have a marginal effect on the willingness of political decisionmakers to cross the threshold, once it is reached they would not change the point at which the decision had to be taken. Nor is there any reason to believe that such a decision would not still be an agonizing one to take, or that it would not be taken with great reluctance and as late as possible.

[9]See J. Digby, *Precision Guided Weapons*, Adelphi Paper 118, IISS, 1975, p. 11.

Defense Schlesinger gave a major briefing to NPG in June 1974 on the current U.S. TNW research and development program. The principal aims of this program were to improve the accuracy of delivery systems; enhance safety and security arrangements; improve C^3I; reduce vulnerability; and tailor weapon effects. Among the programs described were enhanced radiation warheads (a concept that attracted little attention and generated no particular excitement at the time), precision guided munitions, and earth penetrators, but it was made clear that no new "mini-nuke" program was contemplated.

Over the next three years the possibility of significant changes in the Alliance's posture as a result of the introduction of a new generation of armaments attracted increasing public attention.[10] However, when the reports of the Military Implications Team (MIT) and Political Implications Team (PIT) emerged in November 1976 and June 1977 respectively, their conclusions were a good deal less startling than many had expected. The MIT report had concentrated on four main areas: battlefield surveillance, information processing, improved delivery systems, and warhead effectiveness. The principal areas where NATO might hope to gain advantages were identified as the introduction of improved detection capabilities, the reduction of collateral damage, and the possibility of using conventionally armed PGMs rather than nuclear weapons for certain tasks. As far as a nuclear battle was concerned, in most cases there appeared to be no major difference in the way the introduction of such improvements would benefit the attacker or the defender. However, the main conclusion was that, since it seemed probable that the Soviet Union would be able eventually to introduce many of the improvements into its own forces, NATO needed to exploit the new technology to stop the Warsaw Pact gaining a unilateral advantage; but that the net result was unlikely to change radically the course or eventual outcome of a major conflict in Europe. Introduction of technologically advanced systems would therefore not call into question the essential substance of MC 14/3, the Provisional Political Guidelines, or the Phase II Report.

The PIT report reached conclusions broadly complementary to those of the MIT. It indicated that the exploitation of the new technology was likely to be expensive, that it could not offset Warsaw Pact

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[10]See, for example J. Digby, *Precision Guided Weapons*, Adelphi Paper 118, IISS, 1975; R. Burt, *New Weapons Technologies: Debate and Directions*, Adelphi Paper 126, IISS, 1976; J. Holst and U. Nerlich (eds.), *Beyond Nuclear Deterrence—New Aims*, Crane, Russak, and Co., New York, 1977.

numerical superiority in conventional forces, and that the Soviet Union was itself likely to introduce more advanced and sophisticated systems of its own. Nevertheless, the report saw potential political as well as military advantages in some of the possible improvements, notably in the C³I area, which offered the prospect of improved crisis management and consultation machinery. It also suggested that some of the work had implications that ranged wider than the nuclear field and needed examination in a broader framework (this was achieved in practice by taking account of the MIT/PIT work in the Long Term Defence Programme study, which was set up as a result of the NATO summit meeting in London in May 1977). But the principal message was to endorse the MIT conclusion that none of the technical advances in prospect should change the Alliance's view that if the use of TNW had to be contemplated, the overriding objective of such use should be to achieve a political effect.

In retrospect the New Technology study may not seem to have been of great significance. It did not have a major impact on the various Alliance research and development programs already in hand, and it is difficult to identify any specific changes in the Alliance theater nuclear posture that can be directly attributed to the recommendations of the MIT and PIT reports. However, there are two respects in which it had some significance. Firstly, it represented another rebuff to the "warfighting" school; there were undoubtedly some who were less than happy with the outcome, particularly of the MIT report, which represented a clear endorsement of the doctrine developed over the previous decade.[11] Secondly, the study was the first real attempt by the NPG to consider the types and nature of weapons required in the stockpile to meet the needs of the agreed doctrine. The strategy of flexible response and the subsequent NPG work building on it were essentially predicated on the number and types of weapons already in existence, which, as shown in App. C, had been introduced in a largely haphazard fashion. With the New Technology study, the first tentative steps were taken toward ensuring that the doctrine would have an influence on the future development and modernization of the stockpile.

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[11]This view was by no means restricted to official circles: a number of commentators had seen the advent of technological developments as an opportunity for NATO to make radical changes in its TNF doctrine. See, for example, W. S. Bennett, R. R. Sandoval, and R. G. Shreffler, "A Credible Nuclear-Emphasis Defense for NATO," *Orbis*, Summer 1973.

IMPROVING THE EFFECTIVENESS OF NATO'S THEATER NUCLEAR FORCES

The New Technology study had been primarily concerned with possible qualitative improvements to the nuclear stockpile in Europe. But at the same time the NPG was also beginning to recognize that some thought needed to be given to the number of systems needed. By the early 1970s, increasing doubts were being expressed that 7,000 nuclear warheads were really needed in the European stockpile. A Brookings Institution study in 1974 suggested that 2,000 warheads would be sufficient,[12] while a year later former U.S. Assistant Secretary of Defense Enthoven proposed 1,000.[13] Interestingly, Enthoven, who served under McNamara in the 1960s, has suggested that the U.S. Secretary of Defense tried to limit the deployment of TNW in the early 1960s but that there was intense political resistance in Europe; however, that suggestion is difficult to reconcile with the doubling of the stockpile between 1963 and 1966 (see App. C) and with other evidence that the Europeans themselves were critical of the rate of growth of the stockpile during the early NPG meetings. Nevertheless, the fear in some quarters in Washington that the Europeans would regard any major reductions in the stockpile as evidence of U.S. moves towards decoupling (particularly at a time when the U.S. strategic forces were being limited by the SALT process), and that it was therefore better to "let sleeping dogs lie," was an important influence on U.S. policy on TNF in the 1970s.

The Nunn Amendment, which in effect required the U.S. Secretary of Defense to explain the Alliance's theater nuclear policy to Congress, gave the Administration an opportunity to provide a public account of the doctrine developed in the NPG. The report that was produced in response to the requirement of Public Law 93-365 was entirely a U.S. responsibility, but it was the subject of a full discussion at the NPG meeting in December 1974. Both classified and unclassified versions of the report were produced. The latter provided the most extensive public explanation of the Alliance's nuclear policy emanating from an official source since the formation of the NPG.[14] It explained at considerable length both the general background of NATO strategy and the way in which theater nuclear doctrine had

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[12]J. Record, *U.S. Nuclear Weapons in Europe: Issues and Alternatives*, The Brookings Institution, Washington, D.C., 1974.

[13]A. C. Enthoven, "U.S. Forces in Europe: How Many? Doing What?" *Foreign Affairs*, April 1975. Enthoven refers to 1,000 nuclear weapons, but from the context it is clear he means warheads (see App. A).

[14]J. R. Schlesinger, Secretary of Defense, *The Theater Nuclear Posture in Europe: A Report to the U.S. Congress*, April/May 1975.

evolved within that strategy, and also went into much detail about the composition of the stockpile, the arrangements for political control and consultation, C³I, target acquisition, safety, survivability, and so on. However, it did not address in any detail the central question of the precise size and mix of systems in the stockpile—not unexpectedly, since this was a problem the Alliance had not so far attempted to tackle. There was a passing reference to a "preliminary and general analysis of the currently authorized nuclear stockpile" and a proposal that NATO should undertake "more detailed analyses of the present position." The report also described a number of possible theater nuclear force improvements that were under consideration which needed to be taken into account in such a review. This explanation seemed to satisfy Congress, and the pressure for a reduction in the stockpile thereafter evaporated.

Nevertheless, within the Alliance the U.S. took steps to give substance to the proposal for an examination of the stockpile. At the NPG meeting in January 1976, Secretary of Defense Rumsfeld (who had taken over from Schlesinger the previous autumn) circulated a paper on "Improving the Effectiveness of NATO's Theater Nuclear Forces," which built on the proposals in the Nunn Amendment report, as a basis for consideration of the way ahead. This paper listed a number of developments, both in the Soviet threat and in NATO's own capabilities, which might demand changes in NATO's TNF position, and laid particular stress on the development of nuclear forces that were survivable, flexible, and militarily effective (that is, capable of being used with maximum "shock and decisiveness"), but that would still be under strict political control. A discussion of the American proposals was delayed until the following meeting in June so that an initial assessment could be carried out by the NATO Military Authorities. At that meeting it was acknowledged that a good many actions had already been taken or were in hand: the introduction of the Lance missile system; the modernization of the 155mm howitzer; a review of the Nike-Hercules nuclear air defense system; the assignment of additional Poseidon re-entry vehicles to SACEUR to release more dual-capable aircraft for the conventional role; and improved procedures for political control. While it was accepted that a more comprehensive review was desirable, it was felt that this should not be undertaken until the reports from the New Technology study teams were available. The second of these reports from the PIT did not reach the NPG until mid-1977. At that point the Alliance finally took a decisive step in the process of modernizing the TNF stockpile in order to bring it into line with the doctrine developed in the first decade of the NPG's existence, taking account of the probable strategic environment of the 1980s.

THE HIGH LEVEL GROUP AND THE LRTNF MODERNIZATION PROGRAM

At the NATO Summit meeting in May 1977 President Carter proposed the initiation of a major effort to improve Allied defenses, to be known as the Long-Term Defense Program (LTDP). The main focus of this program was to be on improving Allied conventional forces, and it was to be undertaken by nine "task forces" each charged with making recommendations for improvements in specific areas—reinforcement, readiness, electronic warfare, war reserves, etc. There was, however, to be a tenth task force, concerned with theater nuclear forces. Unlike the other nine, it was agreed that this task force should report to the NPG instead of the DPC. The reasons for setting it up were largely political: The principal U.S. concern was to improve Allied conventional defenses, but there were fears in Washington that if the LTDP ignored the nuclear dimension entirely, this might be interpreted in Europe as a move towards "decoupling." For the same reason, to emphasize that the U.S. was still serious about theater nuclear forces, at the NPG meeting the following October, Secretary of Defense Brown proposed that the Task Force 10 work should be undertaken by a "High Level Group" (HLG) of experts from capitals. (The other nine task forces were generally staffed at lower levels, and much of the work was undertaken by the International Staff, the NATO Military Authorities, and national delegations in Brussels.) Although this arrangement was very much in the NPG tradition of using ad hoc groups of experts from capitals rather than the permanent staff in Brussels, the seniority of the members was unusual.

In practice the work of the HLG rapidly became divorced from the LTDP. At the London Summit it had been agreed that there should be a further Summit Meeting a year later to review progress, and the task forces were expected to submit reports for this meeting. Task Force 10 complied by submitting a paper put together by the NATO Military Authorities that was largely a cosmetic exercise, listing measures that were already in hand or planned. Although the HLG prepared a progress report for the 1978 Summit, its work moved forward on a slower time-scale with studies that eventually led to the proposals endorsed by the Alliance in December 1979 for the modernization of NATO's long-range theater nuclear forces.

There are two common misconceptions about the establishment of the HLG. First, the U.S. did not set up the Group to deal specifically with the LRTNF problem. Its original charter was much broader: to look at the whole spectrum of possible modernization of NATO's TNF, both as a complement to the rest of the LTDP effort and as a follow-up to the proposals in the 1976 Rumsfeld paper. Indeed, several months

passed before it was decided at the Group's second meeting in February 1978, largely at European prompting, to focus principally on the LRTNF issue. Second, this particular problem was not a new one. Several commentators have suggested that the work of the HLG was a direct response to the Alastair Buchan Memorial lecture by Chancellor Schmidt in October 1977, when he suggested that a SALT agreement establishing nuclear parity between the United States and the Soviet Union would impair the security of Western Europe unless parallel efforts were made to remove the disparities of military power in Europe.[15] However, a careful reading of the lecture shows that Schmidt's remarks were made primarily in the context of the need for arms control, and particularly for a Mutual and Balanced Force Reductions (MBFR) agreement. Moreover, Schmidt did not refer specifically to the Soviet SS-20 missile or suggest that NATO needed to expand its own LRTNF capability. It is reasonable to trace back the arms control part of the NATO 1979 "double decision" on LRTNF to the Schmidt lecture (the NATO "Special Group" which developed the arms control approach was set up in April 1979 largely as a result of a German proposal), but not the work of the HLG.

Moreover, the LRTNF problem had already been the subject of discussion within the Alliance. There was a school of thought in Washington at one stage that advocated the greater use of submarine launched ballistic missiles (supplementing the 400 Poseidon RVs already assigned to SACEUR) for the LRTNF role, to free increased numbers of dual-capable aircraft for the conventional role, although this idea found little favor in Europe. There was also growing concern about the rapid increase in Soviet LRTNF capability, notably the SS-20 (recorded, for example, in the DPC Ministerial Communique in December 1976). In addition, the existing NATO capability consisted of a relatively small number of aircraft dating from the 1950s and 1960s. A further factor was the increasing interest being shown in the potential of cruise missiles, and European fears that this option might be closed off to the Alliance by SALT II. It is difficult to say exactly what influence the existence of a hitherto unexploited technological option had on the LRTNF debate: It was undoubtedly an important factor but there would be no justification for concluding that this was a case of technological development driving doctrine. In practice, all these considerations contributed in some part to the eventual HLG decision to make LRTNF modernization its first priority.

The events of 1978-79 that led to the adoption in October 1979 of the NATO LRTNF modernization program to base 108 Pershing II

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[15]"The 1977 Alastair Buchan Memorial Lecture," reprinted in *Survival*, January/February 1978.

and 464 Ground Launched Cruise Missiles in Europe, combined with an offer from the United States to negotiate limitations on the LRTNF systems of both sides, have already been extensively chronicled.[16] Moreover, with the Intermediate Range Nuclear Forces (INF)[17] negotiations still under way in Geneva, and the first of the new systems not due to be deployed until the end of 1983, it is too early to attempt a complete account of this phase of the NPG's history. Because of their wider implications, however, two aspects of the HLG's work during this period are worth bringing out.

The first concerns the rationale for the program. Two main strands of argument developed within the Group. One was NATO must be able to respond directly, for both political and military reasons, to the Soviet modernization program (although without necessarily matching the Soviet effort system for system). The second was that NATO had to maintain a complete spectrum of deterrent options so that the Warsaw Pact should not be able to escalate a conflict to a level where the Alliance would have no credible response. (In other words, if NATO had no nuclear capability between U.S. strategic systems and medium-range theater nuclear forces (MRTNF) capable of striking only the non-Soviet Warsaw Pact countries, Soviet leaders might conclude that they could launch widespread nuclear attacks against Western Europe from a sanctuary within Soviet territory. On the basis of this argument, maintaining an effective LRTNF capability was therefore necessary to couple the U.S. strategic deterrent to the defense of Europe.) Not surprisingly, the Americans tended to stress the first argument, the Europeans the second; the Group's eventual report gave due weight to both considerations. But the point to note is that the proposed program was developed against a conceptual framework that provided a rough yardstick for assessing the types of systems required and their approximate numbers. Moreover, this conceptual framework built on, and was entirely consistent with, the doctrine already established by the NPG in the early 1970s.

The second point of interest concerns the size of the LRTNF program. The number of TNW required for a particular role—let alone the overall total in the stockpile—depends on a great many factors, for example, the numbers and types of targets one wishes to be able to

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[16]The LRTNF modernization decision has already spawned a considerable number of papers, articles, and books, and many more are in preparation. Two of the better accounts so far published (although concentrating primarily on the political aspects) are: *The Modernization of NATO's Long Range Theater Nuclear Forces*, Report for the Committee on Foreign Affairs, U.S. House of Representatives, Library of Congress, December 1980, and D. C. Elliot, *Decision at Brussels: The Politics of Nuclear Forces*, The California Seminar, August 1981.

[17]See App. A for a note on the meanings of LRTNF, MRTNF, and INF.

threaten; the degree of certainty of destruction required; the survivability of the delivery system to pre-emptive attack and ability to penetrate predicted enemy defenses; the need to maintain a wide geographic spread to provide credible options wherever conflict occurs; and political considerations, such as the participation of as many nations as possible to emphasize Alliance unity and the possibility of arms control limitations modifying the stockpile. Some of these factors can be quantified with reasonable precision; others can only be a matter for subjective judgment. However, it is possible by making such judgments to reach a balanced assessment of the upper and lower limits governing the total size of a particular segment of the stockpile. In the case of the LRTNF modernization program, the HLG originally suggested a range of 200 to 600 systems. The majority favoured a figure towards the upper end of this range but a minority of the Group, influenced by domestic political interests, pressed for the inclusion of a lower figure. The eventual program of 572 systems reflected not only the majority view, but also took into account the arms control dimension. The HLG reached its initial conclusions before the Special Group had been established, but by the time the figure of 572 was agreed by the NPG in November, the arms control "track" of the 1979 modernization decision was a virtual certainty.

The significance of this element of the HLG's work is that it represented the first occasion on which the NPG had succeeded in reaching agreement on the types *and* numbers of weapons needed for a particular role to meet the requirements of agreed NATO doctrine. Indeed it was the first occasion on which the doctrine had clearly led to a weapons procurement decision; as App. C shows, the rest of the theater nuclear stockpile was largely inherited from the period before MC 14/3 was adopted. While the NPG had devoted much time to the development of a detailed doctrine to "flesh out" the bones of MC 14/3, it had made little attempt prior to 1977 to modify the size and composition of the stockpile to meet the requirements of the agreed doctrine. Recognizing this deficiency, as part of the December 1979 LRTNF modernization decision, NATO Ministers agreed that the HLG should remain in being to study further the size and nature of the rest of the TNF stockpile following the implementation of the modernization program and the withdrawal of 1000 TNF warheads from Europe. (The withdrawal of the warheads, which was an integral part of the December 1979 decision, was completed in 1981, although the U.S. was reluctant to publicize it for domestic political reasons in the wake of Afghanistan, thus wasting an opportunity to influence European public opinion.) A start was made on this study in 1980 with an examination of nuclear defensive systems, but there has been little progress since then. This was initially due to the advent of a new U.S.

Presidential administration (the role of the U.S. being crucial in NATO nuclear policy, any change in the Presidency causes a hiatus lasting from several months to a year or more) and subsequently because much of the available staff effort has been devoted to the START and INF negotiations. Nevertheless, the problem remains, and should form an important part of the NPG's work over the next few years.

III. THE FUTURE OF NATO STRATEGY

THE WEAKNESSES OF FLEXIBLE RESPONSE

Ever since MC 14/3 was adopted—and indeed before—the strategy of flexible response has been subject to attack. Among the more recent comments are Treverton's description of it as "a political compromise, not a military strategy," while Freedman claims it involves "an inadequate conventional defense backed by an incredible nuclear guarantee."[1] Quite apart from such academic commentators, there are of course some who regard as totally unacceptable the morality of any strategy that relies on an implicit threat of the use of nuclear weapons (even in response to a nuclear attack by an enemy). Others argue that the Soviet leadership has no military ambitions in Western Europe, and that it maintains its massive conventional and nuclear forces for two reasons: to retain hegemony in its own sphere of influence, and to counter a perceived threat from both NATO and China (the traditional Russian fear of encirclement). These latter views, however sincerely held, fall beyond the scope of this paper. If correct, they would suggest that there is not only no need for a nuclear-based NATO strategy but indeed none for the Alliance itself. But if it is assumed that, for the foreseeable future, the Soviet Union and its allies will continue to deploy very substantial conventional forces in the European theater, backed up by formidable theater and strategic nuclear forces, and that these combined forces pose a potential military threat to the NATO countries, then the continuing credibility of the flexible response strategy in the 1980s becomes central to the future of the Alliance.

The criticisms of flexible response fall into two broad categories: those that concern the fundamental nature of the strategy itself, and those that relate specifically to the role of TNW within the strategy. The first category includes the charges that flexible response is all things to all men and consequently means nothing to any of them; that any strategy relying on "extended deterrence"—that is, the extension of U.S. nuclear power to guarantee the security of Europe—is incredible because of a Soviet perception that the U.S. will never put its ultimate survival at risk to save Europe; that flexible response satisfies the requirements of neither of the classical theories of deter-

[1]G. F. Treverton, "TNF: Military Considerations," draft chapter in forthcoming book on TNF to be edited by P. Doty; L. Freedman, "NATO Myths," *Foreign Policy*, Winter 1981-82.

rence; that the strategy was credible in a period of U.S. theater nuclear supremacy but is no longer so in an era of parity; and that the risks involved in the strategy are too great since in practice escalation would be impossible to control. The criticisms more directly related to the role of TNW are that the first use of nuclear weapons by NATO is not credible, particularly in view of the Soviet declaratory policy of massive response; that NATO's existing TNW are highly vulnerable to a pre-emptive attack; that the requirements of political control are unlikely to be compatible with timely decisionmaking; and that NATO has failed to develop a credible doctrine for the employment of TNW.

Somewhat different conclusions, however, are drawn by the various critics, however. Some assert that the cumulative effect of these factors is sufficient to undermine the credibility of the strategy in Soviet eyes and hence its deterrent value. Others take the view that, while the strategy may deter deliberate aggression, if a conflict should break out by miscalculation, the course of action prescribed by flexible response would be inadequate to restore deterrence. Still others believe that while flexible response may be adequate to deter the Soviet Union, it can no longer command general public support in the West, and that in the long term it will become impossible to implement force modernization programs necessary to maintain its credibility. All these arguments merit detailed consideration.

CONVINCING THE SOVIET UNION: FLEXIBLE RESPONSE AND PRE-WAR DETERRENCE

It is axiomatic that if a strategy of deterrence is to be effective, a potential adversary must find it credible. Essentially, this means ensuring that in the enemy's calculations, the potential costs of any aggression will always exceed the prospective gains. This does not mean that he has to be certain about the consequences, only that he should deem the risks unacceptably high. Indeed, in general terms, the greater the potential damage to the enemy, the less certainty is needed to convince him that initiating (or continuing) a conflict is not worthwhile. Translating this into practical terms, the flexible response strategy seeks to convince the Soviet Union that any level of aggression would be met not only with a direct response at that level, but that NATO would be prepared, if necessary, to raise the stakes rather than accept defeat. This demands not only maintaining a sufficient range of forces (both in numbers and types) to provide a "seamless web"—that is, to demonstrate that there is no gap in the

spectrum which might lead the Soviet Union to believe that if the conflict were raised to that level NATO would have no credible response—but also convincing the Soviet leadership that NATO has the political will to use these forces in self-defense and, in particular, the preparedness, if necessary, to initiate certain quantum leaps in the level of conflict, the most crucial of which would be the crossing of the nuclear threshold. Finally, for the strategy to be credible it must not only be capable of conveying the desired message in peacetime so as to avoid a conflict occurring at all ("pre-war deterrence"), but also, should it fail in this fundamental purpose, then it must still offer the prospect of terminating the conflict at the lowest possible level consistent with NATO's objectives ("intra-war deterrence").

One charge against flexible response is that it fails credibly to meet the requirements for either of the classical models of deterrence. "Deterrence by denial" is essentially the policy of traditional defense: It is based on an ability to convince the aggressor that his attack will be met by a military response sufficient to prevent his gaining his objective. With numerically inferior forces, the Alliance cannot guarantee the success of such a response at the conventional level; a strategy seeking to deter by such means would demand either a major strengthening of NATO's conventional forces (a return to the original Alliance strategy) or dependence on the threat of using nuclear weapons to achieve military success. Both these possibilities will be considered further below. Arguably, the flexible response strategy is closer to "deterrence by punishment," which does not postulate a direct link between the original offense and the response. Such a policy was seen in its extreme form in the old "trip-wire" strategy, but it lacks credibility unless the recipient of the original aggression can threaten to raise the stakes to a level where the attacker is clearly worse off both in relative and absolute terms. It is thus an appropriate strategy only for a palpably superior power, and is not open to NATO in an age of broad nuclear parity.

But does this failure to meet the theoretical norms mean that flexible response is incredible in Soviet eyes? It is also axiomatic that deterrence (or at least pre-war deterrence) can never be proved to have worked; it is impossible to demonstrate that the Warsaw Pact would have attacked NATO in the absence of a deterrent strategy and the forces to support it. But looked at from the viewpoint of the Soviet leadership, they have every reason to take NATO's declaratory strategy seriously. At the conventional level the Alliance's forces, although numerically inferior, are generally well equipped and trained; particularly if given a period of (properly utilized) warning time, they could certainly be expected to prevent a Warsaw Pact offensive from gaining an easy victory. However, while the Russians might judge that

there was a high probability that NATO would have the will to use these forces, they might nevertheless conclude that the possible gains outweighed the potential costs (which need not necessarily involve a direct threat to the Soviet homeland if a conflict could be contained at the conventional level). A modest improvement in NATO's conventional forces relative to those of the Warsaw Pact would reduce the risk of such a judgment, but could not remove it altogether; there would remain the danger that the Soviet Union might be prepared to use its theater nuclear armory in an attempt to achieve a military success it was unable to gain at the conventional level. While conventional forces are an integral component of NATO strategy (not least to provide an effective response to minor attacks), they cannot by themselves provide a credible deterrent to a nuclear-armed opponent.

If deterrence failed to prevent the outbreak of a conflict, the role of conventional forces would not present NATO with any major doctrinal difficulties; they would have to be used immediately for direct defense in order to demonstrate to the aggressor that he had miscalculated the Alliance's ability to resist and the unpalatable consequences of continuing the attack. The possibility of using nuclear weapons, on the other hand, would involve considerable dilemmas. From the point of view of pre-war deterrence, the Soviet Union might well judge that the likelihood of NATO resorting to theater nuclear weapons was a good deal less certain than that of a conventional response; on the other hand, the potential costs (to both sides) would be very much greater. This argument applies *a fortiori* at the strategic level: The probability of either side risking a strategic exchange may be extremely low, but the consequences of such an action would be so appalling that the threat of it still remains a powerful deterrent.

But even assuming, as NATO must, that Soviet leaders will behave rationally, a decision to initiate an attack would not be a simple matter of calculating the risks, costs, and benefits involved. Less predictable factors would be at work in a crisis: internal pressures, uncertainty about NATO's intentions, and the dynamics of a changing situation. Some commentators, while accepting that the Soviet leadership may well be deterred from a premeditated attack by the existence of substantial NATO conventional and nuclear forces, have argued that the deterrent effect is provided by the fear of the sheer uncertainty of an uncontrollable series of events rather than any deliberate NATO policy for the use of its forces (although such perception could not exist without a range of military options that would permit an escalation of the conflict, whether controlled or not). Should conflict nevertheless occur, such critics argue that the existing strategy would not provide an adequate machinery for restoring deterrence. In particular, this argument tends to focus on the alleged

incredibility of NATO's preparedness to undertake initial use of nuclear weapons in the event of a failure to contain a Warsaw Pact offensive at the conventional level. This raises the question of how the flexible response strategy would operate in a crisis.

RESTORING DETERRENCE: THE ROLE OF NATO'S THEATER NUCLEAR FORCES

As already indicated, it is frequently alleged that NATO has failed to develop a coherent doctrine for the role of its TNF. Section II of this report has sought to demonstrate that such a charge is unfounded, but it is perhaps appropriate to review the main elements of the doctrine. It starts from two fundamental premises: that NATO conventional forces cannot be guaranteed to defeat Warsaw Pact non-nuclear aggression; and that Soviet leaders might not regard as credible a U.S. threat to escalate directly the strategic level (even in the selective manner envisaged in PD 59, given the risk of the response that could result) in a situation where the Alliance was facing defeat by Warsaw Pact conventional forces (or such forces supported by Soviet theater nuclear and chemical weapons). NATO's TNF are therefore intended to fill the gap between conventional and strategic nuclear forces with the aim of providing clear options for resisting levels of aggression that cannot be contained by conventional defense but are not high enough to make it credible that NATO would take the enormous risks of strategic nuclear retaliation. For deterrence to be credible in Soviet eyes, these options must provide a full spectrum of possible Alliance responses so that it does not appear there is a level where NATO would be prepared to accept defeat, either because it lacked the capability for an effective response or because the only responses available would involve such a degree of escalation that Allied leaders would lack the political will to accept the risks involved.

However, in the papers endorsed by Alliance Ministers in the NPG, it has been accepted that NATO's TNF could not win wars in the classical sense of inflicting such damage on the aggressor that he has no effective capability to continue the conflict. Even the use of hundreds of theater warheads on the Central Front (and ignoring the unacceptability of the horrendous collateral damage that would result) would leave the Warsaw Pact with the means of wreaking at least equally great devastation on NATO forces. Moreover, the balance of the remaining conventional forces would probably be tilted even further in the Warsaw Pact's favor. Should deterrence fail to prevent the outbreak of war, NATO's objective, if driven to the use of

its TNF, would thus be to operate on the enemy's will to use his military capability, so as to persuade him to cease his aggression. Although NATO doctrine accepts that the most effective way of achieving this objective would probably be through the use of TNF in a way that had substantial military effect (or maximum "shock and decisiveness," as the Nunn Amendment Report to Congress put it), such use would nevertheless be intended as a means to the political end. The intention would be to convey a clear message to the Soviet leadership of NATO's determination to resist, and force them to reconsider the grave consequences of continuing the conflict. Ideally, it would also involve forcing them into a position where they would themselves have to bear the burden of risk of deciding whether to escalate the conflict further. Even with strictly restrained use, NATO could reasonably hope to impose a substantial setback to a Warsaw Pact offensive and a delay to its resumption in order to permit time for political negotiation and reconsideration.

The criticism of this strategy is that in terms of restoring deterrence (and although the credibility of a deterrent strategy to prevent war—pre-war deterrence—must bear a close relation to the likely contingencies of actual war should a conflict occur—intra-war deterrence —the former is not entirely dependent on the latter) NATO use of TNW would be an irrational act because NATO could not hope to turn a military defeat into victory, except at a local level, and the Warsaw Pact would therefore not have a sufficient disincentive to draw back. Some critics who take this view argue that flexible response was credible when MC 14/3 was adopted in 1967, because at that time NATO had a marked superiority in theater nuclear weapons and could therefore establish "escalation dominance"—that is, threaten to raise the level of the conflict to a point where the Alliance would enjoy a significant military advantage.[2] However, the facts do not bear this out. As shown in App. C, by the late 1960s the Warsaw Pact had deployed some 3,500 nuclear-capable delivery systems, and although many of these were inaccurate and equipped with high-yield "dirty" warheads, they were still capable of inflicting vast damage on NATO forces even after NATO initial use. Indeed the NPG Phase I studies, which were based on the force levels available to both sides in the early 1970s, amply demonstrated the fallacy of this argument.[3]

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[2]The concept of escalation dominance was first developed by H. Kahn in *On Escalation: Metaphor and Scenarios*, Praeger, New York, 1965.

[3]There are some who argue that, because the Soviet Union deployed "dirty" inaccurate systems, any response with such systems would be a form of escalation, thus placing the burden of the decision to escalate on them (and that with the introduction of accurate, lower-yield systems like the SS-20/21/22/23 this is no longer the case). This suggests that the Russians would place the same degree of importance on avoiding

It would of course be irrational for NATO to cross the nuclear threshold, even if facing imminent defeat at the conventional level, in the certain knowledge that the result would be a nuclear response of equal or greater magnitude, leading either to eventual NATO defeat after a vastly greater number of casualties and collateral damage had occurred, or escalation to a point where both East and West faced virtual annihilation. But the crucial point is that no such certainty exists. There are two unique features about the current politico-military situation between East and West. First, in the absence of a first-strike capability on either side (see App. A), virtually unlimited striking power is available to both sides if they are prepared to escalate to the strategic level. Second, there is no precedent for the tactical use of nuclear weapons: Even in the event of only "limited" use on the battlefield, the consequences would be devastating and it is impossible to predict how military or political leaders would react. For example, both the physical and psychological effects of a battlefield nuclear exchange could make it extremely difficult for either side to resume a conventional offensive in the same area after only a brief pause.

In such circumstances much would therefore depend on the intentions of the Soviet leaders, and particularly the extent to which they regarded their vital interests to be threatened by a continuation of the conflict. In the event of a war breaking out as a result of a series of misunderstandings and miscalculations, and in a situation where NATO was facing the prospect of surrender at the conventional level, it would hardly be irrational for a Soviet leadership facing the enormous and immediate risks of nuclear escalation to conclude that they had misjudged the likely consequences of their actions. Nor would it be irrational for NATO leaders to use nuclear weapons in an attempt to induce this result. Both sides would be faced with agonizingly difficult decisions about the balance of advantage; in the event of a conflict which NATO was in danger of losing, the Alliance might be under greater time pressure than the Soviet Union; on the other hand, the alternative to escalation—surrender—would be much more unpalatable for NATO than a decision to cease its attack would be for the Soviet Union. The strategy of flexible response is only untenable either if the risk that deterrence will fail and that as a consequence nuclear weapons may be used is unacceptably high in absolute terms; or that there is a realistic alternative strategy which involves a lower risk; or if one believes that the Warsaw Pact would never be prepared to halt an attack save in the face of direct military defeat.

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collateral damage as would the West—an assumption which would seem to have no basis in fact. It is, however, undoubtedly true that the Soviet capability for very discriminating, highly destructive, pre-emptive attacks has been substantially enhanced in recent years.

It is frequently pointed out that Warsaw Pact military doctrine as exemplified in Soviet military writings and exercises calls for a large-scale nuclear response to any NATO initial use, or indeed a pre-emptive strike if it appeared NATO was contemplating initial use. However, looking at the situation in reverse, if one attempted to describe NATO theater nuclear policy on the basis of unclassified U.S. Army operational manuals, NATO training exercises, and the statements of senior military officers, the resulting picture would differ considerably from the doctrine developed within the political councils of the Alliance. Like NATO, the Soviet Union maintains tight political control over its nuclear weapons, and as the U.S. Secretary of Defense's FY 1977 Annual Report to Congress put it: "The question is whether, in a war in Europe, the Warsaw Pact would follow this highly escalatory doctrine and if so, how effective would their attacks be. National leaders are not, of course, constrained to follow the doctrine their military commanders use to guide training or exercise forces in peacetime, nor do training exercises necessarily indicate most probable tactics."[4] This is not to say that the Soviet Union would not act in a manner consistent with their declaratory policy, but simply that it must not be assumed that they will automatically do so. NATO must therefore take the possibilities of pre-emption and massive response fully into account, but should not plan on the basis that they are inevitable.

One further important point should be made about the credibility of NATO's TNW doctrine. Some of those who have attacked the validity of relying on the implied threat of NATO first use to deter Soviet aggression have nevertheless accepted that the Alliance requires its own TNF to deter Soviet first use. But it is difficult to see how, if it cannot be rational for NATO to seek to deter by the threat of using nuclear weapons first, it can nevertheless make sense to attempt to deter Warsaw Pact first use (which would put NATO at an even greater military disadvantage) by a threat to respond with nuclear weapons. Deterrence is of course a matter of Soviet perception, and although in the absence of any Alliance TNF capability there would be no deterrent whatever to the Soviet Union using (or even threatening to use) its own TNW, the existence of a NATO capability is unlikely to carry much credibility if the Alliance has already announced that it would not use its TNW first, even if faced with conventional defeat, because of fear of the consequences. The only logical conclusion is that if it would not be rational (and therefore not a credible

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[4]D. H. Rumsfeld, *Report of the Secretary of Defense to the Congress on FY 1977 Budget and the FY 1977-81 Defense Programs*, January 17, 1977.

deterrent) for NATO to use TNW first in its own defense, then it would be equally irrational (and incredible) to use them in response to Warsaw Pact first use.

Finally, even if the rationale underlying the strategy of flexible response is accepted as sound, it will not provide a credible deterrent without a full spectrum of options at the theater nuclear level leading right up to the strategic level. The NATO LRTNF modernization program and the various modifications to U.S. strategic targeting policy during the last decade[5] all represented attempts to ensure the continued availability of such options. But in addition, the theater nuclear forces concerned must meet certain operational criteria; in particular they must be under close political control but still capable of rapid response; and they must have an adequate guarantee of survivability against a pre-emptive attack. Criticisms have also been leveled against NATO's current TNW armory for failing to meet such criteria; these will be considered further in Sec. IV.

NO FIRST USE: ALTERNATIVE STRATEGIES

On the basis of the above arguments, it should come as no surprise that the Soviet Union for many years has advocated an agreement between the nuclear powers to renounce the option of initiating the use of nuclear weapons. If the Soviet leadership shares the view of NATO that the Warsaw Pact has a significant advantage in conventional forces in Europe, then any reduction in the likelihood that the Alliance would resort to nuclear weapons in its own defense rather than accept defeat could only be to Soviet advantage. Indeed, the Soviet Union has now taken the step (no doubt with an eye to the effect on Western public opinion and the Third World) of making a unilateral "no first use" declaration.[6] Nevertheless, there has been growing interest in Western circles in a policy of commitment to no first use: In a recent article, four distinguished American commentators called for a re-examination of the case for such a policy;[7] it therefore merits serious consideration.

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[5]Notably the Schlesinger "limited nuclear options" of 1974 and the "countervailing strategy" introduced in Presidential Directive 59 in 1980. These fall outside the scope of this report, but authoritative accounts can be found in L. E. Davis, *Limited Nuclear Options: Deterrence and the New American Doctrine,* Adelphi Paper No. 121, IISS, Winter 1975/6; and W. Slocombe, "The Countervailing Strategy," *International Security,* Spring 1981.

[6]Statement by Soviet Foreign Minister Gromyko at the Second United Nations Special Session on Disarmament, June 15, 1982.

[7]M. Bundy, G. F. Kennan, R. S. McNamara, and G. Smith, "Nuclear Weapons and the Atlantic Alliance," *Foreign Affairs,* Spring 1982.

Leaving aside for the moment the question of how such a policy would affect the credibility of NATO's deterrent, it is first relevant to consider whether the Alliance would gain any security advantage. As with all declaratory statements of this kind, there is no guarantee that the Soviet Union would abide by a no first use policy in the event of a conflict between East and West. The Soviet nuclear arsenal would remain in being, and there would be no physical, verifiable safeguards to prevent it being used. Moreover, the Soviet Union's record in keeping to non-binding agreements is not encouraging—for example, in the case of the human rights provisions of the Helsinki Final Act, or indeed the undertaking in Article 2 of the UN Charter not to use force against the territorial integrity or political independence of any state, which was so flagrantly disregarded in the invasions of Hungary, Czechoslovakia, and Afghanistan. And while the first use of nuclear weapons is not integral to Soviet strategy—there would be little incentive for the Warsaw Pact to resort to such use if they could win a military victory at the conventional level—there is no significant public voice in the Soviet Union that would place any constraint on military preparedness or training to use nuclear weapons. NATO therefore cannot afford to regard the Soviet declaration as a sound basis on which to conduct operational planning or force provisions. At best, the declaration would make it marginally more difficult for the Soviet Union to cross the nuclear threshold in an actual conflict, but there is no reason to believe that, in the sort of circumstances that would prevail if this option was ever being considered, it would have much influence on such a decision.

From the point of view of NATO's deterrent posture, it could be argued that the effect on the Alliance's freedom of action would be equally limited (although if this were the case, a no first use declaration would seem to have little point). But this ignores two important differences. Firstly, the preparedness to consider crossing the nuclear threshold in the face of imminent defeat by superior Warsaw Pact conventional forces is an integral part of NATO's deterrent strategy. In terms of Soviet perception (the key to deterrence), while the Soviet leadership might not feel able to rely on NATO's abiding by a no first use undertaking in the event of war, it might nevertheless judge that the likelihood of NATO first use was somewhat diminished (or at least that a timely decision would be more difficult to make) and that the risks involved in aggression were correspondingly reduced. This might not have a crucial effect, but it would at least represent some weakening of the credibility of the NATO deterrent. But secondly, and more important, a no first use declaration would fundamentally undermine the rationale for NATO's strategy of flexible response. NATO being an Alliance of democratic states, it is essential to main-

tain public support for its collective defense policy (a consideration examined in more detail below), which demands that Alliance strategy must be perceived by public opinion as having a coherent rationale. Moreover, it would be impossible for the Alliance to continue to include a first-use option in its military planning, since this would inevitably become publicly known. In short, quite apart from the signal that it might convey to the Soviet Union about NATO's willingness to defend itself, the inescapable consequence of adopting a no first use policy would be a change in NATO strategy.

There are three basic ways in which NATO strategy might be changed: a return to the "trip-wire" strategy of MC 14/2; the development of a theater nuclear "warfighting" doctrine (in its extreme form —see Sec. II, footnote 3); or a greater reliance on conventional forces. The first two would in fact not be compatible with a no first use policy, but for the sake of completeness it is worth considering them briefly. A return to "trip-wire" can be quickly dismissed: Much as the European Allies might wish to remove the risk of a major conflict (conventional or nuclear) in Europe, the reasons for the abandonment of MC 14/2—basically, the existence of an invulnerable Soviet second-strike capability—still remain valid, and no strategy based on massive retaliation could hope to provide a credible deterrent to aggression in Europe. A nuclear warfighting doctrine, on the other hand, if capable of implementation, could well form an effective deterrent; several commentators have put forward quite plausible arguments for such a strategy.[8] However, such approaches generally rely on the assumption that NATO would be prepared to initiate the large-scale use of theater nuclear weapons at an early stage in a major NATO-Warsaw Pact conflict. For such a strategy to be effective, the Alliance would probably have to be prepared to pre-delegate authority to its military commanders to use nuclear weapons, and accept both a high risk of further escalation and a substantial level of collateral damage (even though this might be reduced by use of precision-guided, low-yield weapons). While such a policy might lead to a military posture that would provide an effective deterrent, these conditions would, without doubt, be totally unacceptable to European political leaders. To advocate such policies, however attractive in military terms, is thus as unrealistic as to seek a return to "trip-wire."

However, most advocates of "no first use" have suggested the third option: a greater reliance on conventional forces. The most obvious

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[8]See for example, W. R. Van Cleave and S. T. Cohen, *Tactical Nuclear Weapons—An Examination of the Issues*, Crane, Russak, New York, 1978; D. R. Cotter, "NATO Theather Nuclear Forces—An Enveloping Military Concept," *Strategic Review*, Spring 1981; J. Record, *NATO's Theater Nuclear Force Modernization Program—The Real Issues*, Institute for Foreign Policy Analysis Inc., November 1981.

objection to such a course is its cost. The target of 3 percent annual real increase in defense expenditures agreed by the Alliance as part of the 1977 Long Term Defense Program has been achieved by only a small minority of the nations contributing to the Integrated Military Structure of NATO, even though most member Governments have expended considerable political capital in attempting to meet the goal. (Not that the 3 percent target should be undervalued; it enabled many governments to achieve a higher level of defense spending than might otherwise have been possible.) But despite all these efforts, the net effect has only been to check the downward slide of Alliance force capabilities relative to those of the Warsaw Pact, not to close the gap. It is therefore unreasonable to suppose that in the future NATO is going to be able to increase further the resources devoted to collective defense to a point where the Alliance conventional forces could guarantee to contain and defeat a major Warsaw Pact offensive by direct defense. (In a recent article, the present SACEUR suggests that even if NATO countries could achieve a 4 percent annual increase, which is needed to meet the current force goals, it would not be sufficient to warrant adopting "no first use" policy.)[9]

Some commentators, starting with Enthoven and Smith in 1971,[10] have argued that NATO either already has sufficient conventional forces for a successful defense or that such a position could be achieved with relatively minor force improvements. It is argued that, despite numerical inferiority in both manpower and equipment, NATO has a marked advantage in the quality and training of its personnel and in defense technology; that the attacker normally requires considerable numerical local superiority over the defender; and that the Soviet Union could not rely on the dependability of its Warsaw Pact Allies. These points have considerable weight, although there are some other potential Soviet advantages besides weight of numbers—for example, being able to choose the time and place of an attack, and the relatively short lines of reinforcement between the Soviet Union and Central Europe. However, if the Soviet leadership judges that a conventional attack on NATO is unlikely to succeed, then this supports rather than undermines the strategy of flexible response. Any actions that NATO can take to reinforce such a Soviet perception are of course to be welcomed, both to strengthen pre-war deterrence and, should deterrence fail, to keep the nuclear threshold as high as possible so that NATO would face a decision on possible first use as late as possible.

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[9]Gen. B. W. Rogers, "The Atlantic Alliance," *Foreign Affairs*, Summer 1982.

[10]A. C. Enthoven and K. W. Smith, *How Much Is Enough? Shaping the Defense Program 1961-69*, Harper and Row, New York, 1971.

But none of this demonstrates that NATO, even if it devoted considerable additional resources to conventional defense (and assuming the Soviet Union did not simply respond by doing the same), could guarantee that a conventional defense would always succeed and that the decision to cross the nuclear threshold would never be faced. It is important to note here that, before espousing a no first use policy, there must be virtual certainty that a conventional defense will succeed—not even high confidence will suffice. A strong conventional defense is a central element of a flexible response strategy, but it cannot entirely eliminate the need for either theater or strategic nuclear components. To adopt a no first use policy in the belief that it could do so would only risk sending a signal to the Soviet Union that NATO was prepared to contemplate surrender at the conventional level rather than resort to the use of nuclear weapons in its own defense, and hence weaken the credibility of deterrence.

One final point should be made about "no first use." It is often forgotten that both the United States and United Kingdom gave assurances in 1978 that they would not use nuclear weapons against any non-nuclear-weapon states that are parties to the Non-Proliferation Treaty, except in the case of an armed attack on themselves, their forces, or their Allies by such a state in association or Alliance with a nuclear-weapon state. Although this formula (the so-called "negative security assurance") does not rule out initial use of nuclear weapons in the event of a NATO-Warsaw Pact conflict—indeed it was specifically designed not to preclude this option—it does provide an undertaking not to use nuclear weapons against third parties in almost all other likely situations. Furthermore, the NATO members as a whole have underlined their commitment to the "no first use of force" undertaking in the UN Charter by reiterating that NATO "has never and will never initiate the use of force."[11]

CONVINCING OURSELVES: THE PUBLIC DIMENSION

This section has so far been concerned largely with the credibility of the strategy of flexible response in Soviet eyes. In addition, it is of course essential for NATO governments themselves to be convinced of the validity of the strategy; otherwise, Allied cohesion could collapse in a crisis. But, as suggested above, given the democratic nature of Western society, it is also crucial for Alliance strategy to command

[11]Nuclear Planning Group Ministerial Communique, Colorado Springs, March 23, 1982.

the support of the majority of the public. Without such support, in the long term it would become impossible for Allied governments to maintain the forces necessary to sustain the credibility of the strategy. In this context, challenges to the present strategy arise from two disparate sources. The first stems from the inevitably different European and American perspectives on the defense of Europe, and the second from the so-called "peace movement," which opposes any strategy based on the possession of nuclear weapons.

As described in Sec. II, flexible response from the outset represented a political compromise between American and European views, and was recognized as such. The problem initially results from the need to apply the concept of "extended deterrence" in an age of nuclear parity. Even if an entirely conventional defense were possible, the Europeans would be reluctant to pin their faith on its acting as a deterrent because the Russians might regard the risks as tolerable (and the consequences of a full-scale "conventional" war in Europe could be appalling, albeit not on the cataclysmic scale of a major nuclear war). On the other hand, the Americans could not accept an essentially nuclear strategy because of the risks of rapid escalation to a strategic exchange between the U.S. and Soviet Union. The compromise of flexible response, involving a combined conventional/nuclear deterrent, while avoiding to some extent the problems of these two extremes, nevertheless still gave rise to two fears within European public opinion: firstly, doubts that the U.S. nuclear guarantee could still become "decoupled" from Europe in the event of a conflict, and secondly, concerns about the risks involved in a strategy that encouraged controlled escalation and possible first use of nuclear weapons.

The decoupling problem, common to any strategy involving extended deterrence, is unavoidable given the nature of the Alliance and the balance of forces between East and West. Well before MC 14/3 was adopted, the first steps were taken to try to reassure European opinion on the strength of the U.S. guarantee: the stationing of substantial numbers of U.S. servicemen (and their dependents) in Europe; the introduction of theater nuclear weapons in Europe; the assignment of U.S. nuclear forces to SACEUR; the introduction of "dual key" nuclear weapons, with the delivery systems operated by European forces; and the undertakings on nuclear consultation given at Athens in 1962. Since 1967, the introduction of limited nuclear options, the "countervailing strategy," and the LRTNF modernization program have represented further steps in this process. Successive American Presidents have also reiterated the fundamental nature of the U.S. commitment to Europe in the strongest terms. But ultimately, a strategy that depends for its effect on the uncertainty it creates in a potential adversary can never simultaneously provide a totally certain

guarantee to the Alliance. From this standpoint, the continued credibility of the flexible response strategy to European public opinion will depend on the perception of the U.S. commitment to the defense of Europe, and it would be difficult to argue that this commitment is any weaker now than it has been throughout NATO's thirty-year history.

The fears of the risks involved in a flexible response strategy, which have been voiced with increasing stridency by the various nuclear disarmament groups, are more difficult to deal with, because they frequently involve a misinterpretation (whether deliberate or not) of the purpose of the strategy. The "hardline" disarmers object to any suggestions that nuclear war is conceivable (let alone winnable), but they have also fostered the belief that NATO strategy, because it involves thinking through the consequences of nuclear conflict, in some way makes such a conflict more likely. Moreover, new weapon systems (particularly lower-yield, more accurate weapons) are perceived as evidence that NATO is moving towards a nuclear warfighting strategy. Such fears are reinforced by publicity given to the views of a small minority of analysts in the defense community who argue that NATO should indeed modify its approach by exploiting the Western technological advantage to the maximum in an attempt to establish some form of nuclear escalation dominance.

The fear that NATO is moving away from a concept of deterrence has now become quite widespread, and together with an understandable concern about the consequences of nuclear war, has contributed to the resurgence of the anti-nuclear groups in Europe.[12] It is, however, based on the misconception that the deterrent effect of NATO's nuclear forces can be separated from NATO's plans for their use. In practice, NATO's capability can deter only if the Soviet Union perceives that there are realistic options for its use. Deterrence rests on having both a military capability to resist and the will to use it; unless NATO has meaningful operational plans, the Soviet Union could doubt whether the Alliance is prepared to defend itself. The same logic underlies NATO's thinking about the nature of actual use: The most effective way of conveying a message about the Alliance's continuing will to resist, if driven to the point of employing nuclear weapons, would be to use them to substantial military effect.

However, although NATO may have been successful in conveying the right message to the Soviet Union, it is failing to do so with a

[12]The "freeze" movement in the United States, which calls for a verifiable ban on the production, testing and deployment of nuclear weapons and delivery systems by both superpowers, is somewhat different in nature. Although drawing much of its impetus from fear of a nuclear holocaust, it has broader-based support, and many of its advocates would not endorse the sort of unilateral measures espoused by the European "peace movement."

sizable minority of Western public opinion. It is clear to anyone who studies official statements by the Alliance collectively, or by individual member governments, that NATO does not believe that nuclear war (whether "limited" or total) can be won. Since U.S. administrations are often accused of supporting "nuclear warfighting" (in the sense of "war-winning"—see Sec. II, footnote 3), it is worth noting that the Annual Defense Department Reports published in March 1974 and January 1980, in the sections dealing with limited nuclear options and the countervailing strategy respectively, make it clear that Defense Secretaries Schlesinger and Brown did not accept such ideas. There is no doubt that, if a major conventional war broke out in Europe, and if nuclear weapons were used even on a limited scale, the risk of escalation to the nuclear level would be considerable and the consequences for both sides could be appalling. There would also be a grave risk that, despite NATO's clear aim to terminate the conflict at the lowest possible level, any nuclear exchanges would be very difficult to control. But that risk must not be confused with the much more crucial danger of such a conflict breaking out in the first place. NATO strategy is above all concerned with preventing a conflict: That is the purpose of deterrence.[13] There are some signs of a wider public recognition that, faced with a potential adversary possessing substantial conventional and nuclear forces, a deterrent strategy founded on Alliance possession of nuclear weapons—however uncomfortable or morally repugnant—is the safest system available to preserve peace in the foreseeable future.

THE SURVIVAL OF FLEXIBLE RESPONSE

Although there have been some fluctuations in political relations between East and West since the strategy of flexible response was formally adopted by NATO some fifteen years ago, it can be argued that communications, understanding, and agreement between the two sides are better than they were in the 1960s. In the area of arms control, SALT I and the ABM treaty made a considerable contribution to stability; the major provisions of SALT II are still being observed and the START and INF negotiations are under way. The existence of "hot lines" and agreements to consult in potential crises provide an added safeguard against miscalculations; modern technology has reduced even more the previously almost negligible chance of nuclear

[13]A concise and elegant exposition of the case for a nuclear deterrent strategy is provided in an essay on "Nuclear Weapons and Preventing War," contained in the 1981 United Kingdom Statement on the Defence Estimates, Cmnd. 8212, April 1981.

war by accident; and the balance of forces, although it has tilted further in favor of the East, has not begun to approach a point where it would become destabilizing. Alliance intelligence assessments have consistently concluded that there are no signs that the Warsaw Pact has any immediate plans to attack the West. While it may be impossible to prove that deterrence founded on nuclear weapons has played a key role in this situation, it is reasonable to conclude that the Soviet Union continues to believe that the risks in an attack on NATO considerably outweigh the possible gains. Western public opinion is a less predictable factor. It may be that each generation has to repeat the cathartic process of public debate on nuclear deterrence, and there is no doubt that the Soviet Union will take every opportunity to exploit this debate; but opinion polls suggest that a substantial bedrock of support for the Alliance still prevails throughout the member countries, along with a widespread recognition that nuclear deterrence may well be a safer way of avoiding the risks of nuclear war than a policy of unilateral nuclear disarmament.

For the next decade, therefore, it is difficult to see NATO moving away from a deterrent strategy based on some balance of conventional and nuclear forces. Moreover, despite its shortcomings, it is also difficult to see any practical alternative to flexible response, in view of the political (and to a lesser extent economic) constraints on the Alliance. This is not to say that there should be no change to the NATO force posture within the framework of the strategy, particularly in terms of improving conventional defenses. Flexible response does not demand the first use of nuclear weapons; it simply does not rule out such an option in the last resort. In the longer term, NATO must devise some better system than reliance on a "delicate balance of terror." But nuclear deterrence is a system designed to cope with a situation marked by a deep ideological conflict and in which each side could inflict devastating destruction on the other. While arms control agreements will help to limit the latter problem, an alternative to deterrence will depend on a more permanent easing of the political divide.

As far as NATO theater nuclear forces are concerned, there is also scope for some adjustment within the framework of flexible response. Although the Alliance has, over the last fifteen years, reached broad agreement on a doctrine for the use of its TNW within the framework of MC 14/3, it has been much less successful in modifying the size and balance of the nuclear stockpile to meet the requirements of this doctrine. The final section of this report will consider some of the ways in which NATO's theater nuclear posture might be adapted to meet the political and strategic needs of the 1980s.

IV. THE FUTURE OF THE THEATER NUCLEAR STOCKPILE

THE REQUIREMENTS OF FLEXIBLE RESPONSE

The NATO strategy of flexible response requires the capability to employ theater nuclear options at various levels of conflict, ranging from highly selective limited use against military targets (although not necessarily confined to the battlefield) up to general nuclear release. As the Nunn Amendment Report to Congress pointed out, two of these options are of particular importance: response to a theater-wide pre-emptive nuclear attack, and initial use in the event of an overwhelming Warsaw Pact conventional attack. For deterrence to be credible, the Soviet Union must not only perceive that NATO has adequate theater nuclear forces to provide an appropriate response in either case, but also that enough of these weapons would survive a concerted Soviet attack on them (with either conventional or nuclear forces). The Annual U.S. Defense Department Report for Fiscal Year 1977 suggested that this leads to a twofold requirement for theater nuclear forces:

(i) The Warsaw Pact must appreciate that NATO has an assured capability to execute its theater-wide nuclear war options in the event of a surprise nuclear attack; and
(ii) NATO must be capable of executing effective nuclear attacks against Warsaw Pact military forces, with discrimination and limited collateral damage, in response to a major conventional or limited nuclear attack.

Much of the debate about NATO's theater nuclear posture concentrates on the second of these requirements, and particularly on the specific case of possible NATO initial use in a position of imminent conventional defeat. This is understandable, since such a situation would confront NATO with an acute political dilemma. But it must be recognized that, although the Soviet leaders might be reluctant to risk the danger of escalating the conflict to the nuclear level themselves while they still believed they could achieve their objectives using conventional forces, the temptation to launch a pre-emptive strike would be very great once they were convinced that NATO first use was probable. And from the point of view of determining the size and composition of the NATO theater stockpile, the requirement to prepare for such a situation places the most exacting demands on the

Alliance. While it is necessary for NATO to have available a wide range of options, both in terms of types of weapons and geographic spread, in order to undertake the limited but militarily effective strikes envisaged in the Provisional Political Guidelines, the number and spread of weapons needed in order to survive a pre-emptive Warsaw Pact strike would almost certainly be more than adequate to subsume the requirements of NATO initial use.

Warsaw Pact forces are generally structured for offensive rather than defensive operations, and their training suggests an intention to follow up theater-wide strikes against NATO conventional and nuclear forces with rapid attacks by their armored forces to exploit the nuclear strikes. To provide credible retaliatory responses to such attacks—and hence to deter them—NATO needs to have sufficient survivable theater nuclear weapons to be able to prevent (together with the remaining Alliance conventional forces) Warsaw Pact armored forces from rapidly seizing NATO territory, both by attacking these forces and by attacking or threatening other Warsaw Pact targets of value. Moreover, since the primary aim of such a response would still be to operate on the political will of the Soviet leadership by convincing it that there was no prospect of a cheap or easy victory, the requirements of shock and decisiveness which would apply to NATO first use would be equally relevant in this case. But so also would be the political requirements to try to control the risks of further escalation and to minimize collateral damage. This would undoubtedly be extremely difficult to achieve, but it might involve, for example, a combination of clearly perceivable limits on the scale of the NATO response together with the threat of more extensive strikes should the Warsaw Pact escalate further.

In considering the size and shape of the Alliance theater nuclear stockpile needed to meet these requirements, certain assumptions must be made about the actions of political leaders in a crisis. In the case of NATO, the most important of these is that effective use should be made of the warning time available before an impending attack. Even in the worst case, this warning should amount to at least 48 hours, and could amount to weeks or even months in the more probable event of a deteriorating political situation in Europe. Such warning should enable NATO to take the steps necessary to bring its theater nuclear forces to a full state of readiness, including dispersal in the field where appropriate. In the case of the Soviet leadership, it must be assumed that they will continue to act rationally—although this does not mean that they need behave in accordance with Western concepts of controlled escalation and graduated response, or that they will necessarily attach the same significance to crossing the nuclear threshold or restricting collateral damage. Given these assumptions,

two key principles should govern the make-up of the Alliance TNF stockpile. Firstly the demands of MC 14/3, and more specifically the detailed doctrine developed in the NPG, must be met, although it has to be recognized that this still contains ambiguities which leave room for difficult judgments on the size and characteristics of the stockpile. Secondly, within this general framework, NATO must be able to deploy a force capable of providing a credible response to a Soviet attempt to destroy NATO's TNF pre-emptively, either with conventional forces or in a combined conventional/nuclear attack (but in circumstances where a conflict has already broken out and the attack is not a "bolt from the blue").

These general principles are underpinned by a number of more detailed military and political considerations that influence the precise types, numbers, and characteristics of theater nuclear weapons which NATO requires for credible deterrence.

MILITARY FACTORS

Survivability is the single most important military consideration. The credibility of NATO's deterrent posture will be seriously in question unless both the TNF themselves (both warheads and delivery systems) and their essential support (particularly C^{3}I and logistics) are sufficiently survivable to have an effective retaliatory capability even after a pre-emptive attack. To that end, a very high premium must be placed on the mobility of delivery systems. Most of NATO's artillery and missile systems are mobile to a greater or lesser extent, although some of the older systems are dependent on extensive and vulnerable logistic support. Dual-capable aircraft, on the other hand, being dependent on large fixed airbases, are at a disadvantage; even though improved air defenses and aircraft shelters have considerably improved prelaunch survivability in the event of conventional attack, the aircraft remain at risk in the case of nuclear strikes.

The effectiveness of mobility as a counter to pre-emptive attack depends on adequate warning and on timely decisions to take the necessary dispersal measures. This is particularly important for the survivability of the warheads, which, except in the case of those forces maintained on Quick Reaction Alert (QRA), are generally stored separately from the delivery systems. The storage sites are relatively few in number (a figure of less than 50 has been quoted)[1] and it must be

[1]See, for example, J. Record, "Theater Nuclear Weapons: Begging the Soviet Union to Pre-empt," *Survival*, September/October 1977. Other sources have suggested substantially higher figures (in excess of 100), but the general principle remains the same.

assumed that their locations are known to the Warsaw Pact. While considerable progress has been made in recent years in safeguarding these sites against terrorist attack or sabotage, they remain vulnerable to a major conventional assault, let alone nuclear strikes. Dispersal of the warheads before any outbreak of hostilities, either together with delivery systems (in the case of nuclear dedicated systems) or with mobile custodial teams capable of linking with delivery units when required, is therefore essential even if politically difficult.

A large number of nuclear-capable delivery systems, together with a wide geographic spread and a proportion of the forces based well back from the likely battlefield, will also enhance survivability. It is also an advantage if the delivery units are capable of self-contained operation—i.e., independently of logistic support—for long periods once dispersed. (The ground-launched cruise missile force due to be deployed in Europe starting in late 1983 meets all these criteria.) Survivable communications are also essential. This means not only hardening equipment to resist electromagnetic pulse (EMP) and other blast and thermal effects of nuclear explosions, but also maintaining redundant (duplicate) communication networks and hardened command headquarters and communication centers.[2] Finally, it is also worth noting, although it falls somewhat outside the scope of this report, that NATO's conventional forces, as well as its TNF, should be capable of operating effectively in a nuclear (and indeed chemical) environment.

A second important military requirement is flexibility: the ability not only to threaten a wide range of targets but also to undertake highly selective, carefully controlled and limited, strikes. The types of possible target range from mobile front line and second-echelon Warsaw Pact armored units and their immediate tactical support (including artillery, surface-to-surface missiles, and tactical air support), through deep interdiction targets including rear-based forces and command and control centers in Eastern Europe, up to strikes against military/industrial targets deep in the Soviet Union. Not only does this obviously require a variety of nuclear-capable delivery systems to threaten the various types of target, but it also demands effective target acquisition capabilities, particularly to deal with time-dependent targets. This means the ability to detect and identify threatening forces before they can inflict significant damage on NATO forces; loca-

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[2]An extensive discussion of the vulnerability of C^3 systems can be found in D. Ball, *Can Nuclear War be Controlled?* Adelphi Paper No. 169, Autumn 1981. Although the paper is concerned primarily with strategic nuclear systems, many of the points are equally applicable to C^3 for theater nuclear forces.

tion of the targets with sufficient accuracy to serve the needs of the delivery systems; and timely communication of the information to allow a successful attack to be mounted. In turn, the delivery system must have sufficient accuracy, range, and ability to penetrate enemy defenses to attack the target, and an ability to respond rapidly once the nuclear release decision is taken. However, if the primary objective in using TNF is to convey a political signal, this need not necessarily demand a high degree of confidence in the destruction of any one particular target. The frequently used 90-percent kill probability, which (depending on the type of delivery system) may require the allocation of two or three weapons to a given target, might therefore be relaxed.

In summary, then, from a military standpoint, a deterrent posture based on a flexible response strategy requires a theater nuclear stockpile that provides NATO political leaders with a range of options to threaten both fixed and mobile targets, from those on or near the battlefield right through to those deep in Warsaw Pact territory (including the Soviet Union) over the full geographic spread of any likely conflict between NATO and the Warsaw Pact. Even though NATO is most likely to wish to utilize its TNF in a selective and limited manner, the total numbers and types of weapons required will still largely be a function of this need to provide a wide range of options, particularly in the event of large-scale, pre-emptive Soviet strikes. Thus, the greater the survivability of NATO's TNF, the fewer the weapons needed. In addition, for credible deterrence, NATO must be seen to have modern, survivable command, control, communications, target acquisition, and intelligence capabilities. The forces themselves must be supported by discrete, limited, selective, release-employment plans (although in the case of mobile battlefield targets there is clearly a limit on the extent to which such plans can be drawn up in advance). It is nevertheless important to recognize that the existence of such plans provides no guarantee that a nuclear conflict could be limited; but on the other hand, neither do they make the possibility of war any more likely—indeed, by seeking to demonstrate that the price of aggression would be prohibitively high, they enhance deterrence.

POLITICAL FACTORS

If survivability is the single most important military factor influencing the nature of the TNF stockpile, then control is probably the predominant political consideration. As described in Sec. I, the ultimate collapse of the MLF proposal and the formation of the NPG can

be attributed to the question of European involvement in the control over nuclear weapons. Whatever the military advantages of early use of nuclear weapons, NATO political leaders are most unlikely to authorize such use, and still less will they delegate responsibility for nuclear release even to the Major NATO Commanders, to say nothing of field commanders. Indeed, in the case of NATO initial use, the U.S. President or U.K. Prime Minister would almost certainly want to approve specifically the number and type of weapons to be used, and the proposed targets. In terms of implications for the stockpile, this means in the first instance an effective safeguard against unauthorized use (or terrorist attack) which would nevertheless not impose a lengthy delay in the event of an actual release order. The development of electronic Permissive Action Links (PALs), which are fitted to all weapons in the U.S. TNF stockpile and have replaced the older mechanical devices, have largely met this requirement.

The requirement for tight political control also underlines the need, for effective and survivable communication systems whereby political decisions could be rapidly transmitted to the firing units. The procedures for nuclear consultation have been outlined in Sec. II; while there are possibilities for short-circuiting some of the steps in the process, there would be considerable problems in conveying the original request (in a "bottom-up" procedure); obtaining political authority; relaying the authorization to the unit; and preparing and arming the weapon, to allow timely use before the weapons were overrun or the circumstances of the original request had been overtaken by events. The delays imposed by the political requirements for control are unavoidable, but this makes it all the more important that the delays inherent in the physical process of transmitting messages are kept to an absolute minimum.

A second important political consideration is the need to minimize collateral damage—that is, unintended damage to civilian facilities, or civilian casualties resulting from a nuclear strike against a military target. Alliance leaders will undoubtedly wish to limit such damage as far as is practical, particularly in the case of any weapons likely to be used on NATO territory. The most obvious way to do so is to use low-yield weapons; but to achieve the required military effect, this in turn calls for weapons of high accuracy. (As the NPG New Technology Study pointed out, the introduction of high accuracy or precision guidance may in fact enable conventional weapons to be used for roles that were assigned to nuclear weapons in the past, thus helping to raise the nuclear threshold.) The NATO stockpile already includes a large number of low-yield warheads, and Alliance targeting plans are specifically designed to limit the risks of collateral damage. Further advances may be possible by "tailoring" weapon effects,

as with the enhanced radiation weapon (ERW), a primary characteristic of which is the ability to limit collateral damage.

The experience with the ERW illustrates a further and more general political factor: the influence of public opinion. The impact of the various anti-nuclear movements on NATO strategy has already been considered in Sec. III, where it was concluded that they are unlikely to undermine the flexible response strategy in the foreseeable future. Nevertheless, the general mood of public opinion will impose a major constraint on the Alliance's freedom of action in future modifications to the nuclear stockpile. The implementation of the crucial LRTNF modernization program still hangs in the balance (although at the time of writing, the political situation in several of the basing countries seems more favorable to successful deployment than it was in mid-1981), and it is inconceivable that the ERWs now being manufactured and stockpiled in the United States will be deployed to Europe unless there is a radical change in the political climate. Over the next few years, it therefore seems probable that it would be extremely difficult to introduce any major new nuclear weapon system. Modernization of existing systems should be less controversial, while improvements to the various support functions should not present any serious problems. The general question of public opinion also underlines the importance of maintaining widespread direct involvement of the European Allies in NATO's nuclear posture, both by accepting the stationing of U.S. weapons on their territory and by operating "dual-key" delivery systems. (The political case for the widespread involvement of the European Allies conveniently parallels the operational requirement for a wide geographic spread of weapons.) The policy of Norway and Denmark not to accept nuclear weapons on their soil in peacetime (although both make provisions for possible wartime deployments) is of long standing and, as part of the "Nordic Balance," understood by the rest of the Alliance. But should any of the Allies who currently accept U.S. basing and/or operate "dual-key" delivery systems with U.S. warheads reverse their positions, the consequences for the cohesion and unity of NATO as a whole would be serious.

One final general political factor that has taken on increasing significance is the question of arms control. The arms control "track" of the 1979 NATO "double decision" on LRTNF modernization was essentially developed in response to a need perceived by European governments (particularly by the FRG) to demonstrate to the public that the Alliance still remained committed to the principles of detente and disarmament. By linking the modernization proposal to an arms control offer, the Alliance has provided an incentive for the Soviet Union to accept limits on its own forces; but making the offer in advance of deploying the first NATO missiles must tempt the Soviet negotiators

to stall, in the hope that public opposition may prevent deployment in at least some of the NATO basing countries. Lack of progress in the negotiations will in turn make the hurdle of initial deployment the more difficult for NATO to surmount. Nevertheless, the INF negotiations now in progress in Geneva have some reasonable prospects of success, particularly if, in the first stage, an agreement can be confined to long-range, land-based missiles, as proposed by the Alliance, since there are relatively few types of these systems, and they are all dedicated to the nuclear role. However, there will undoubtedly be considerable problems to overcome, and these will be increased once the Alliance moves, as it inevitably must, from the "zero option" proposal. These will include the counting rules to be adopted (warheads or launchers), the geographic scope (the range of the SS-20 raises particular problems), prevention of circumvention (particularly by short-range systems), and the perennial arms control problem of verification. There is also the difficulty of the considerable disparity in numbers between East and West. Nevertheless, it may be that many of these problems can be eventually reconciled by some form of linkage between INF and START negotiations.[3]

The extension of arms-control negotiations to cover long-range aircraft would, however, raise even greater difficulties, as would any involvement of shorter-range systems. The crucial problem is that the vast majority of such weapons in the NATO stockpile are dual-capable, and the continued maintenance of the these systems in the conventional role is essential to the Alliance's deterrent posture. Any limitations on such delivery systems would therefore have to be negotiated as part of a wider package of constraints on conventional armaments, and the experience of the MBFR negotiations suggests that it would be extremely difficult to reach agreement. The alternative of placing limitations only on warheads would involve almost insuperable verification problems: Warhead numbers could be verified only by intrusive inspection on a scale that might even give rise to reservations within the Alliance, and would almost certainly be unacceptable to the Warsaw Pact. A further complication is that the inclusion of shorter-range systems would raise the issue of dual-key systems: Any negotiations covering delivery systems operated by the European Allies with U.S. warheads (and it is difficult to see how they could be excluded) could well lead to the Europeans wishing to become directly involved. The result would be bloc-to-bloc negotiations of the MBFR

[3]One possible method of doing this, by means of a common overall ceiling and limited "freedom to mix" rules between strategic and LRTNF systems, was developed by British analysts and subsequently made public by L. D. Freedman in his article "The Dilemma of Theatre Nuclear Arms Control," *Survival*, January/February 1981.

type, which again would make progress more difficult. A more fundamental problem could conceivably arise with respect to the implications for the continuing credibility of NATO strategy in the event of major reductions in TNF systems, but it seems more likely that the sheer complexity of the other issues will rule out the extension of negotiations to cover shorter-range systems, at least in the near future. (A proposal to reduce the number of U.S. theater nuclear delivery systems and warheads in exchange for a reduction in Soviet armored forces was introduced by the Alliance into the MBFR negotations in the mid 1970s—the so-called "Option III"—but it raised major problems and was finally abandoned in 1979.)

One arms-control proposal that has been attracting some attention recently is the idea of a "battlefield nuclear weapon free zone"; it was included as one of the recommendations in the recently published report of the "Palme Commission" on Disarmament and Security.[4] This would involve the banning of all nuclear weapons from a zone either side of the NATO-Warsaw Pact border in Central Europe (and possibly subsequently on the Northern and Southern Flanks) for a distance of perhaps 150 km. The utility of battlefield (short-range) weapons has itself been the subject of some questioning, and this will be considered further below. But it is difficult to see how the removal of such systems from the forward area would have much value: Both sides would still maintain a very substantial armory of weapons with sufficient range to deliver weapons on the battlefield even when based some distance away; and given the mobility of short-range weapons, they could rapidly be reintroduced into the area. Indeed, given that most of the delivery systems concerned are dual-capable, only the warheads would have to be moved forward.

The Palme Commission report recognizes these limitations, but still favors the idea as "an important confidence-building measure." However, the main contribution of confidence-building measures in enhancing security is that they provide greater warning of the impending onset of a conflict; consequently, a nuclear-free zone is likely to have little value since, if deterrence failed, the movement of nuclear systems into the forward area would be one of the last steps to be taken in preparing for war. The Soviet member of the Commission, Arbatov, expressed a dissenting view with which it is difficult to disagree: He described such an agreement as "of small military significance [which] would be difficult to negotiate and could create an unfounded impression of enhanced security." It might be added that any proposal to remove nuclear weapons from a specified geographic

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[4]*Common Security: A Blueprint for Survival*, Report of the Independent Commission on Disarmament and Security Issues, Simon and Schuster, New York, 1982.

area is likely to suffer from the same objections: Targets within the area will still be vulnerable to weapons based outside the area; nuclear weapons could be rapidly reintroduced in a crisis; and there would be verification problems. It is worth noting that the wider a nuclear-free zone, the more disadvantageous it would be to NATO. A zone, say, 500 km wide would require the Alliance to withdraw all its weapons from the Central Region (presumably to the U.S. or the U.K.), whereas the Soviet Union would only need to move its systems just behind the boundary of the zone.

IMPLICATIONS FOR THE FUTURE NATO THEATER NUCLEAR STOCKPILE

Against the background of military and political considerations, it is possible to draw some general conclusions about the future size and composition of the various elements in the NATO theater nuclear stockpile over the next decade. Perhaps the simplest category to deal with is *long-range TNF*, principally because it has recently been the subject of intensive study in the High Level Group. As indicated in Sec. II, the recommendations of the Group, which formed the basis of the LRTNF modernization program approved in 1979, represented the first occasion on which a TNF procurement decision (both in terms of the types of weapons to be adopted and their numbers) had been based firmly on a careful analysis of the requirements of Alliance doctrine. Provided the decision is implemented, at least in large part (and subject to any modification that is necessary as a result of an INF arms control agreement), there should be no need for any significant change to this segment of the stockpile for at least the next decade. The U.S. F-111 aircraft based in the U.K., which (now that the U.K. Vulcans have been withdrawn) provide the Alliance's only land-based LRTNF capability at present, can be expected to remain in service to supplement the new LRTNF missiles until the 1990s. Should the modernization program suffer a major collapse (an outcome that would have far-reaching consequences for the cohesion of the Alliance) probably the only feasible alternative would be a sea-based force, which will be considered further below.

The vast majority of NATO's *medium-range TNF* arsenal is provided by dual-capable aircraft—F-4s, F-104s, Jaguars, and Buccaneers, with Tornados and F-16s due to be introduced shortly—amounting to some 650 aircraft in total. (Not all aircraft of these types in the NATO inventory are necessarily nuclear-capable; they may not be configured to carry nuclear weapons or operated by

nuclear-trained crews.) Manned aircraft have some important advantages in the nuclear role, perhaps the most significant being their flexibility: They can be rapidly retargeted, they are capable of carrying several different types of warhead, and they can be kept under close control until a very late stage. They are thus particularly useful for operations against non-fixed targets well beyond the battlefield, and because of their mobility and range can provide a means of rapidly concentrating nuclear firepower at any particular point over a wide area of operations. Many of the older aircraft suffer from the serious disadvantage of not being able to operate effectively at night or in adverse weather, but this is not the case with the new all-weather aircraft now being introduced. Moreover, advances in target acquisition and weapon guidance systems have greatly improved the accuracy that can be expected for air-delivered weapons. Dual-capable aircraft also have the political advantage, of increasing importance, that the introduction of new aircraft types and modernization of the warheads they carry has in the past tended to attract little attention (although the question of whether the Dutch F-16s should be given a nuclear role is now the subject of some debate in the Netherlands), and in addition it costs relatively little to add a nuclear capability to an aircraft designed primarily for the conventional role. On the other hand, dual-capable aircraft suffer from some serious disadvantages. They must necessarily operate from fixed—and therefore vulnerable—air bases, and they are also considerably more vulnerable to enemy air defenses than missiles. This means that in the event of a conflict at the conventional level, SACEUR would be faced with the dilemma of losing a substantial part of his nuclear assets by attrition, or reserving a proportion of the aircraft for possible use in the nuclear role, thus weakening his conventional defense and lowering the nuclear threshold. As noted above, dual-capable aircraft would be very difficult to subsume in any arms control agreement.

The remainder of NATO's MRTNF armory consists of the 180 Pershing IA missiles in service with U.S. and FRG forces. That number will drop to 72 when all the U.S. launchers are converted to take the longer-range Pershing II missiles as part of the LRTNF modernization program. It is possible that a modified version of the existing missile, the Pershing IB, which incorporates a number of improvements, may replace the German missiles. The mobility of the Pershing IA gives it some protection against both conventional and nuclear attacks, although the launcher is relatively cumbersome and must be fired from pre-surveyed sites, which to some extent increases its vulnerability. Although the system dates back to the early 1960s, it is still a very effective weapon system for use against both fixed and mobile targets deep in non-Soviet Warsaw Pact territory. On strategic

grounds there is a strong case for introducing a new medium-range, mobile, surface-to-surface missile (with a maximum range of between 500 and 1000 km), dedicated to the nuclear role, to replace the Pershing IA. This would release more dual-capable aircraft for use in a conventional conflict and supplement the capability of Lance (see below) for use against shorter-range targets. Such a system should have greater mobility and improved accuracy, target acquisition, and communications capabilities. It might also provide a basis for extending an INF arms control agreement to cover the Soviet SS-22/Scaleboard and SS-23/Scud systems. However in the present political climate it is difficult to see agreement being reached for the deployment of such a missile, at least until the controversy over LRTNF modernization has died down. Moreover, no such system is currently under development, and the U.S. Congress is unlikely to vote funds to develop a new missile without a reasonable degree of certainty about its eventual deployment. An alternative would be to deploy increased numbers of GLCM and Pershing II missiles, both of which are effective at ranges well below their maxima (although the GLCM is not very suitable for use against time-dependent targets), but this would also be politically difficult and could be in conflict with an INF arms control agreement.

Much attention has recently been focused on NATO's *short-range TNF* or battlefield weapons. These provide over half of NATO's TNF capability (excluding defensive systems)—some 1150 8-inch and 155mm howitzers and Lance missiles (plus a small number of obsolescent Honest John missiles still in service with Greek and Turkish forces), out of an overall total of about 2150 systems. It has been suggested that about one-third of the total NATO inventory of 6000 warheads are allocated to these systems.[5] Critics argue that, because of their short range and the fact that they are necessarily deployed far forward, battlefield weapons would increase the pressure on Alliance leaders to cross the nuclear threshold early in the conflict before the weapons were overrun. Since the targets for such weapons would almost certainly be mobile, the problems of timely release authorization and target acquisition would be particularly acute, and in addition the weapons would almost certainly have to be employed on NATO territory. (Most of these criticisms do not apply to the Lance missile, however, which has a maximum range of over 100 km. Preliminary consideration is now being given in the U.S. to various options for a new Corps Support Weapon System (CSWS), which

[5]See, for example, J. Alford, "Tactical Nuclear Weapons in Europe," *NATO's Fifteen Nations*, Special Issue No. 2, 1981, and L. E. Davis, "Extended Deterrence in the 1980s/1990s," Adelphi Paper (to be published).

might start to replace Lance by the end of the decade, but it is likely that the NATO inventory will continue to include substantial numbers of Lance missiles well into the 1990s.)

On the other hand, battlefield weapons have some important advantages. Because of the very large number of howitzers, and their mobility, the delivery systems have a high degree of survivability. The large numbers also reflect widespread national participation: Eight nations operate the 8 inch howitzer, more than with any other nuclear system. Although of limited range, the delivery systems are accurate and the warheads of relatively low yield. Being dual-capable, they have the same political and financial advantages as dual-capable aircraft. Finally, the very existence of these systems would make it more difficult for Warsaw Pact armored forces to mass for an attack, when they would be particularly vulnerable to a nuclear strike, and also would act as a deterrent against Soviet use of their own battlefield weapons (although this is also true for other TNW in the NATO armory).

One of the problems associated with battlefield weapons is that they are frequently perceived as probable "first use" weapons, in which event the requirements of political authorization and control would undoubtedly present considerable difficulties. But there is no reason why NATO, in an attempt to convey a political signal by highly selective strikes and, if necessary, by controlled escalation, should necessarily start with the shortest-range systems and work upward. An equally, if not more probable option would be for initial use to take the form of a small number of precise strikes against key military facilities on non-Soviet Warsaw Pact territory, accompanied by messages through diplomatic channels designed clearly to communicate NATO's intentions. If this failed, and the Alliance were faced with the problem of trying to reinforce the message, use of battlefield weapons on a larger scale than the initial use would be a possible option. Even if not used in this way, battlefield weapons would still be essential to help to deter a massive Soviet response. The problems of early use and "overrunning" can be overcome to some extent (at the expense of some reduction in flexibility) by dispersing the custodial units with the warheads into the field but not deploying them forward to join the delivery units until as late a stage as possible. (The howitzers, being dual-capable, would of course have to be deployed forward in their conventional role.)

Indeed, in the interests of flexibility and survivability, there is a case, rather than decreasing the number of battlefield nuclear weapons, for all the 155 mm howitzers deployed with NATO forces to be given a nuclear role (i.e., to be "nuclear certified"); at present, some do not have nuclear-trained crews and are therefore restricted to the con-

ventional role. On the other hand, it is difficult to see why NATO should deploy such large numbers of warheads for these weapons, even allowing for the requirements of flexibility and a wide range of options. There would appear to be a strong case for a reappraisal of the number of warheads involved, to see if substantial reductions can be achieved without any adverse effects on NATO's deterrent position. If such a reduction proves possible, as well as producing some useful financial savings, it could have a strong positive effect on public opinion, although because of the difficulties of verification, any reduction would almost certainly have to be unilateral rather than part of an arms control agreement. One additional complication should be mentioned here: The enhanced radiation warhead was designed primarily for use with battlefield weapons; the implications of this are considered further below.

NATO also deploys two *nuclear defensive systems:* the Nike-Hercules nuclear air defense system and atomic demolition munitions (ADMs). Both have already been the subject of study by the HLG in the aftermath of the 1979 decision. In the case of the former, there are now serious doubts both about the utility of and the need for any nuclear air defense system. To be effective, an air defense system might well have to be used at an early stage in the conflict, thus risking premature crossing of the nuclear threshold; the result of high-altitude nuclear explosions would also create a hostile environment for NATO's own aircraft. Moreover, operational tactics have now changed: Air attacks are more likely to be at low level than at the altitude where nuclear air bursts would be most effective. It is intended that Patriot, the replacement system for Nike-Hercules, will be conventionally armed. ADMs similarly suffer from the problem of early use and also, in the case of forward emplaced systems, the risk of the weapons being overrun by advancing enemy forces. At present it seems likely that the ADM stockpile will be reduced but that some of the weapons will be retained, particularly for employment on the flanks of NATO where the terrain is well suited to their use and where the problems of early use might not be so acute.

This report has been concerned primarily with land-based TNF. At present the majority of *sea-based systems* are intended for use against maritime targets, although NATO operates some systems with a land-attack capability. The most important of these are the 68 A-6 and A-7 aircraft normally based on U.S. carriers in the Mediterranean. In addition there are 400 U.S. Poseidon re-entry vehicles and 64 U.K. Polaris ballistic missiles assigned to SACEUR, but on the basis of the SALT definitions these are strategic weapons, and in any event their operational characteristics make them not very suitable for selective release. If used in the European theater, they would probably form a

part of General Release (the use of all of SACEUR's nuclear assets in the event of an all-out nuclear war). However, the possibility of sea-basing for future NATO TNF systems has been raised, particularly as a possible alternative to the planned LRTNF modernization program. (Given the probable deployment areas for either ship or submarine platforms, any such system would almost certainly have to fall in the LRTNF range category.)

Sea-basing of land-attack systems has two important advantages: It substantially reduces the risk of collateral damage in the event of a Soviet pre-emptive strike, and it offers a considerably enhanced survivability (although this is true for submarines rather than surface ships). However, it also has some major drawbacks which caused the HLG, after careful consideration, to reject a sea-based option for the LRTNF modernization program. If missiles are to be deployed on existing ships or submarines, their TNF function will often conflict with the platform's primary role, which may well require it to operate out of range of European land targets. Dedicated platforms on the other hand are very expensive, particularly the more survivable submarines. Moreover, the firing of a small number of missiles as part of a selective strike would greatly increase the vulnerability of the platform by revealing its location. Command and control arrangements for sea-based systems also present some problems that would restrict flexibility for limited strikes. Finally, sea-based systems lack political visibility: They neither provide a clear link between European theater forces and the U.S. strategic deterrent, nor do they permit the sort of direct European involvement that is possible with forces based on European soil. Although the U.S. has initiated a program to deploy cruise missiles on existing "hunter-killer" submarines (SSNs) to supplement existing strategic forces, it seems unlikely that these could have a significant TNF role. At best they might supplement the planned LRTNF forces, freeing some dual-capable aircraft for use in the conventional role, but it is unlikely that they could be guaranteed in advance to be available for such tasks. A sea-based force might be considered as a poor second-best alternative, however, if the planned LRTNF program collapsed for lack of political support.

Clearly, whatever the precise composition of NATO's TNF stockpile, it cannot function as a credible deterrent without effective *support functions*. Survivability, which is crucial for the Alliance forces, is a function not only of their ability to survive a pre-emptive attack, but also of their dependence on their logistic support arrangements—for example, air bases for aircraft and main operating bases for some missile systems. An important consideration for future NATO TNF is the extent to which they can be designed to minimize these support requirements by the provision of autonomous capabilities. This ap-

plies not only to the delivery systems but also to the warheads, which are particularly vulnerable to pre-emptive attack because they are stored in peacetime at only a small number of sites. That number cannot be significantly increased because of the need to make the sites secure from terrorist attack; consequently, there must be effective arrangements to disperse them rapidly, with integral logistic support, either in time of tension or, at the latest, shortly after an outbreak of hostilities (either together with their delivery systems in the case of weapons dedicated to the nuclear role, or separately in the case of dual-capable systems). Such arrangements will place a very heavy burden on the command, control, and communications support, and although a good deal has been done in recent years to upgrade both technical facilities and communication procedures, much more remains to be done—for example, in the provision of mobile hardened command posts; protection of major command centers; and improvement of the survivability of communication links by hardening and duplication. One advantage of such programs is that unlike new weapon systems they are unlikely to attract much public opposition.

Finally, there is question of the extent to which *technological developments* may affect the future stockpile. As far as warhead technology is concerned, programs to "tailor" weapons effects have been carried out for over twenty years. The possibility of very low-yield weapons had been debated in the late 1950s, and the Davy Crockett system was deployed briefly in the 1960s, while the possibility of enhanced radiation weapons (ERW) had been discussed in an article by Dyson as early as 1960.[6] The "mini-nuke" and "neutron bomb" controversies, which broke out in 1973 and 1977, respectively, owed much to initial press stories which implied that the U.S. had secretly initiated new warhead programs involving radical changes in NATO employment policy[7]—much to the surprise of the U.S. administrations of the day, which had not been particularly secretive about what they regarded as fairly routine developments. Programs to develop very low-yield weapons have not been pursued for two main reasons: First, the increasing accuracy of delivery systems has made it possible to use conventional weapons for roles that would previously have demanded a nuclear warhead, and second, the existence of very low-yield weapons might be thought to "blur" the nuclear threshold—not that this would necessarily make the agonizing decision to cross the threshold any easier, but that the signal conveyed by the use of such

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[6]F. Dyson, "The Future Development of Nuclear Weapons," *Foreign Affairs*, April 1960.

[7]An account of the public debate on both issues, with extensive references to the press articles of the time, is given in F. Barnaby (ed.), *Tactical Nuclear Weapons: European Perspectives*, published by SIPRI in 1978, pp. 49-64.

weapons might not be sufficiently clear. Of course the lower the yield, the lower the collateral damage, but the sub-kiloton-yield warheads currently deployed already go a long way in this direction.

The position on ERW is more complex. As the result of some fairly maladroit handling of the issue, new ER warheads for the 8-inch howitzer and Lance missile are now being produced and stockpiled in the U.S. without any guarantee that they will be deployed in Europe. (In the case of Lance, the ER warheads make up only a small portion of the total warhead stockpile, but for the 8-inch howitzer they represent a complete replacement of the aging shells now stored in Europe.) It now seems certain that the political climate will preclude such deployment—ironically, since the original concept (explained in the Nunn Amendment Report in 1974) was to minimize collateral damage. Although stockpiling the weapons in the U.S. clearly reduces their vulnerability to pre-emptive strike, the decision to deploy them to Europe in a crisis might be a difficult one for political leaders on both sides of the Atlantic, and the move itself would employ U.S. airlift capabilities that would almost certainly be in heavy demand for other purposes. Nevertheless, this is a situation the Alliance now has to live with. But it has more far-reaching repercussions for the 155mm howitzer, whose nuclear shells will also need replacement over the next few years; these represent a very large segment of NATO's battlefield armory, and the Alliance could not afford to have these warheads also stockpiled on the wrong side of the Atlantic. Before a decision is taken on the modernization of the existing 155mm shells, the Alliance must decide whether it favors an ERW replacement; it would be a mistake for the U.S. to embark on a 155mm ERW program without European (and above all German) agreement to deployment. It is also noteworthy that, leaving aside the ill-informed and emotional reactions that have characterized much of the public debate, the experts are not unanimous on the subject although the majority tend toward the view that the introduction of ERW would represent a modest but useful enhancement of NATO's deterrent.[8] NATO has conducted no detailed studies on the implications of introducing ERW; it may be that such studies should form part of the current NPG examination of the stockpile.

One further area of development in the warhead area merits a mention: the introduction of variable-yield warheads, as noted by Cotter.[9]

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[8]See, for example, K. F. Wisner, "Military Aspects of Enhanced Radiation Weapons," *Survival*, November/December 1981, and R. G. Shreffler, with comment by S. T. Cohen and W. R. van Cleave, "The Neutron Bomb for NATO Defense: An Alternative," *Orbis*, Winter 1978.

[9]See Donald R. Cotter, James H. Hansen, and Kirk McConnell, *The Nuclear "Balance" in Europe: Status, Trends, Implications*, United States Strategic Institute, Washington D.C., USSI Report 83-1, 1983.

The added flexibility thus provided should enable significant reductions in the total stockpile. In the non-warhead area, the possibility of improvements in the C^3I capabilities has already been discussed. There is also an urgent need to develop and deploy improved, survivable, target acquisition and selection capabilities, coupled with further improvements in the accuracy of delivery systems. As the NPG New Technology study concluded in 1977, it is unlikely that such improvements would dramatically affect the military balance between East and West, but they would nevertheless provide a valuable strengthening of NATO's deterrent posture. As with improvements in C^3I, they would have a relatively low political profile.

CONCLUSIONS

The fundamental assumption underlying this review of the possible modification and development of NATO's TNF stockpile is that the strategy of flexible response, as set out in MC 14/3 and elaborated by the Nuclear Planning Group, will survive at least for the next decade. This is not simply because all the alternatives are less satisfactory (although the analysis in Sec. III suggests that they are), but because attempts to change the strategy would, as Thomson puts it, "not only be politically foolhardy, but make little strategic sense: the risk sharing implicit in flexible response and its escalation doctrines—deliberate escalation, escalation control and escalation linkage—still make sense for an alliance in which the principal nuclear guarantor resides on the 'wrong' side of the Atlantic."[10] When MC 14/3 was formally adopted by NATO in 1967, the Alliance could not claim that it possessed escalation dominance either at the strategic or theater nuclear level. And although the balance of forces has moved further in favor of the Warsaw Pact since then, it has not done so to such an extent as to undermine the credibility of the deterrent: Despite its ambiguities, flexible response remains as valid now as it was when it was introduced. That is not to say that NATO should not seek further improvement in its conventional defenses; the greater the probability of a successful conventional defense, the more credible the deterrent—and, should deterrence fail, the greater the chance of terminating a conflict without resort to nuclear weapons. But as long as there remains even a remote possibility of the Alliance facing a

[10] J. A. Thomson, "Theater Nuclear Force Planning Issues," unpublished paper for the IISS Barnett Hill Conference, May 1982, to be published shortly in an expanded form.

conventional defeat (recognizing that the Warsaw Pact will have the advantages of geography and possibly surprise), and as long as the Soviet Union retains its own TNF capability, the Alliance cannot afford to rule out the possibility of a resort to nuclear weapons.

On the assumption that MC 14/3 remains the strategy of the Alliance, the priorities for NATO in the future modernization of the TNF stockpile would appear to be as follows:

1. *Successful implementation of the 1979 LRTNF modernization program* (modified if necessary by the outcome of the INF negotiations). Not only is this highly desirable from the standpoint of a credible deterrent strategy, but also the implications of failure would be so serious for Alliance cohesion that the political importance of the program has become even more crucial.
2. *Improvements in the survivability of both weapon systems and support functions.* In the case of weapons, there is a limit to what can be done without the introduction of new, mobile, nuclear-dedicated weapon systems (which would be difficult to achieve for political reasons), but continued improvements in dispersal arrangements offer some prospects of enhanced survivability. This will, however, put an even greater premium on improved and more survivable C³I systems. Upgrading and hardening of command and control facilities is perhaps the most pressing requirement in the TNF area.
3. *A review of the future requirement for battlefield nuclear-weapons with a view to possible reductions in the number of warheads required.* Such a review will need to resolve the issue of whether modernized warheads for the 155mm howitzer should have an ER capability. A reduction in the number of warheads does not necessarily suggest a reduction in the numbers of nuclear-certified delivery systems; indeed there may be a case for increasing them.
4. *Phasing-out of the Nike-Hercules nuclear air-defense system and substantial reductions in holdings of ADMs.*
5. *Further improvements in delivery system accuracies and target acquisition capabilities*, to provide greater assurance of destruction with minimum collateral damage.

Ideally, one would add to this list the acquisition of a new land-based, mobile, medium-range missile dedicated to the nuclear role, in order to free more dual-capable aircraft for conventional operations (although because of their flexibility, particularly against mobile targets, some aircraft would still be needed for a nuclear role). The current political climate makes it unrealistic to contemplate such a

program, however, at least until the GLCM and Pershing II deployments have been completed.

The temptation is strong to go further and offer specific recommendations on the size and composition of the stockpile. However, as already discussed, defining the numbers of weapons required involves a complex set of judgments that encompass both military factors (many of which are classified) and political considerations that call for careful analytical study. In the case of the LRTNF program the HLG, after eighteen months work, was able to do no more than propose a bracket of 200 to 600 systems. Studies on the MRTNF and SRTNF segments of the stockpile are likely to be even more complex, but they must represent a high-priority task for the NPG. As a very rough estimate, the steps listed above might well make it possible to reduce the warhead stockpile by at least a further 1000 to 2000 warheads over and above the 1000 withdrawn in 1980. One thing is certain: The present stockpile is primarily a legacy of the weapon systems and warheads accumulated in a largely haphazard manner in the 1950s and 1960s, and while the result may not be incompatible with the requirements of flexible response, it has not been tailored to meet the specific needs of the strategy. Future nuclear weapon procurement decisions must be dictated by the doctrine, as was the LRTNF decision.

Finally, there remains the public dimension. After virtually a decade during which discussion on nuclear weapons policy was largely limited to Defense Ministers meeting in the highly secret confines of the Nuclear Planning Group, to the small number of officials supporting them, and to a handful of interested academics, the subject is now very much back on the public stage. No one working in the field can now afford to ignore public opinion, which has effectively reversed one nuclear weapons decision (ERW) and put a second in some doubt (LRTNF), and it will be a major factor to be taken into account in future modernization programs. NATO governments, somewhat belatedly, have begun a major effort to educate their publics about the facts of life of nuclear deterrence. This is not an easy task because it involves countering the natural emotional reaction against the potentially appalling consequences of nuclear war with logical (and sometimes complex) arguments about the most effective policy for keeping the risk of such a conflict to a minimum. Recent opinion polls suggest that these efforts are beginning to have some effect. Any progess in the START and INF negotiations would undoubtedly have a helpful effect, as would a further unilateral reduction in the number of NATO's nuclear warheads. Because of the problem of dual-capable systems, it is difficult to see arms control negotiations making early progress in limiting shorter-range systems, but a breakthrough in the

MBFR negotiations leading to a balance of conventional forces at a lower level would have the valuable side-effect of raising the nuclear threshold. Nevertheless, there is no doubt that both the U.S. and European governments will have to continue to take every opportunity to explain the rationale behind NATO's dependence on nuclear weapons as an essential element in its deterrent strategy. There can be no return to the secrecy of the 1970s; if flexible response is to endure, it must not only continue to deter the Soviet Union, but also command the confidence and support of Western public opinion.

Appendix A

NUCLEAR WEAPON TERMINOLOGY

Confusion has arisen over the terms used to describe the various types of nuclear weapons. The terms "strategic" and "tactical" were in general use in the 1950s, but at that time they denoted the types of *use* of nuclear weapons, not the weapons themselves. Although there are no authoritative definitions of these terms, strategic use is generally understood to be the employment of nuclear weapons against urban/industrial (countervalue) or military (counterforce) targets with the object of affecting the enemy's will or ability to continue waging war; tactical use has the more limited purpose of affecting a specific military situation.

However, the terms "strategic" and "tactical" soon came to be used to describe the types of weapons then deployed. This did not create problems when "tactical" weapons were first introduced, since they were very-short-range howitzers that could not possibly be used in a strategic role, but the distinction became very blurred with the introduction of large numbers of nuclear-capable aircraft, some of which had sufficient range to enable their use for either strategic or tactical purposes. As early as 1962, fifteen years before Chancellor Schmidt popularized the term "Eurostrategic weapons," Professor Blackett pointed out that a tactical nuclear war in Europe would be a strategic one for the Europeans.[1] The deployment of Thor and Jupiter IR/MRBMs in Europe in 1958 enabled the Soviet Union to claim that these were strategic weapons since they could strike the Soviet homeland, whereas the equivalent SS4/5 missiles (first deployed about the same time) were not, since they could not reach the United States from Soviet bases. This eventually led to the introduction of the term "theater" nuclear weapons, categorizing them by location rather than role. (The first formal use of this term in NATO appears to be in a paper on "The Role of Theatre Nuclear Strike Forces" prepared in 1969, which discussed the possible utility of weapons primarily intended for tactical use in a strategic role.)

Despite the increasingly widespread use of the term "theater," the distinction between strategic and theater weapons was still not clear-cut. The potential difficulties are well illustrated by the U.K. Vulcan

[1]P.A.S. Blackett, *Studies of War*, Oliver and Boyd, London, 1962.

bombers, which were part of the U.K. strategic force prior to the introduction of Polaris, but were transferred in 1968 to the theater role. Weapons of this type became known as "grey area" systems. The problem was eventually solved by the SALT negotiations, which specified which systems were to be regarded as "strategic offensive arms." The SALT II agreement broadly defines such systems as ICBMs with a range of over 5500 km; SLBMs on nuclear submarines or "modern" SLBMs on any type of submarine, and heavy bombers (defined by type) and bombers equipped with ALCMs with a range in excess of 600 km.[2] This still does not result in an entirely unambiguous distinction; for example, some U.S. authorities regard the Soviet Backfire bomber, which was the subject of a separate Soviet statement outside the SALT II Treaty, as a strategic system, although this is a view shared by few Europeans; while the French regard their S3 IRBMs—like other French forces not part of the NATO Integrated Military Structure—as strategic rather than theater weapons. But it nevertheless provides a practical working definition: Strategic nuclear weapons are those defined in draft Article II of the SALT II treaty; the rest are theater weapons. "Tactical" is a term better used only in its original sense of describing a type of use of nuclear weapons and not the weapons themselves.

Theater nuclear weapons are often subdivided into four categories by their range:

- Long-range TNW—those with a maximum range of over 1000 km (some authorities use 1500 km). Confusingly, the Soviet term for such systems is medium-range weapons.
- Medium-range TNW—those with a maximum range between 150 and 1000 km.
- Short-range TNW (often referred to as "battlefield nuclear weapons")—those with a maximum range below 150 km.[3]
- Defensive systems—Atomic Demolition Munitions (ADMs) and nuclear air defense systems (but excluding antiballistic missile [ABM] systems, which are generally regarded as falling in the strategic category).

Nonstrategic *sea-based* nuclear weapons are difficult to categorize; most are intended for use against maritime targets, but some have a land-attack capability. However, because of the inherent mobility of sea-based platforms such systems are normally treated as being in a

[2]The actual definitions, contained in Article II of the proposed treaty, are a great deal more detailed and precise.

[3]Some commentators have used "tactical" to describe short-range TNW and "theater" for all other non-strategic systems, but this distinction is not generally accepted.

separate category. They are not considered in any detail in this report.

Definitions based on range must be treated with caution, however. The range of an aircraft (or more exactly its operational radius) is particularly difficult to define because it depends, for example, on configuration, weapon load, and mission profile. In addition, most weapon systems can be used at ranges well below their maximum. (It is also worth noting that while strategic systems are generally regarded as having intercontinental range, some SLBMs—included in SALT and thus strategic on the basis of the above definition—in fact have a range below that of the Soviet SS-20 missile, generally accepted to be a theater weapon.) In 1981 the position was confused further by President Reagan's introducing, in his "zero option" speech of November 18, the term "intermediate range nuclear forces" (INF).[4] This had a two-fold purpose: first, to try to appease the concerns of some Europeans who regarded the term "theater" as implying a willingness to fight a limited nuclear war, and second, to emphasize that the negotiations on LRTNF (subsequently retitled INF), which started in November 1981 in Geneva, should not be confined to systems based in the European theater, but should encompass such weapons as the mobile SS-20, which can cover targets over most of Western Europe even when based east of the Urals. The lower limit of INF has not been clearly defined, but it appears to cover all systems falling into the LRTNF category and at least some MRTNF systems. An unambiguous definition of the term INF will probably not be achieved until an agreement is reached in the INF negotiations on the systems to be covered, along the lines of Article II of the SALT II Treaty.

Some analysts have suggested that definitions should be based on yield, for example, by designating all weapons with a yield above 500 kT or 1 MT as strategic. However, apart from the problem that all the nuclear powers tend to be extremely reticent about weapon yields, the advent of systems of much greater accuracy and variable yield warheads have made such distinctions largely inappropriate. There is now a considerable overlap between the yields of warheads carried on some theater missiles and those on strategic weapons.

Finally, the terms "weapon," "first use," and "first strike" often cause confusion. The term "weapon" is often used loosely as being synonymous with "nuclear warhead." In this report "nuclear weapon" is used to describe the combination of a nuclear warhead with a nuclear-capable delivery system (missile, howitzer, aircraft, etc.). The

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[4]"Intermediate" in this context bears no relation to the use of the word in "intermediate range ballistic missile" (IRBM), which describes a missile with a range just below that of an ICBM (approximately 3000 to 5500 km).

distinction is important because many NATO TNW are operated under so-called "dual key" arrangements under which the warheads are provided by the U.S. and the delivery systems by one of the European Allies; the majority of the weapons are dual-capable, i.e., the delivery system can have a separate conventional role. The terms "first use" and "first strike" also are often misunderstood. A first strike attack is one intended to destroy, pre-emptively, an opponent's nuclear capabilities. The term is most often used in the context of an attack at the strategic level in which the intent is to nullify the enemy's ability to launch a retaliatory response (a "counterforce" attack), but it can also be used to describe an attempt to eliminate the option of a response at a particular level. "First use," on the other hand means just what it says: the first use of nuclear weapons at any level and against any target by either side.

Appendix B

THE COMPOSITION OF THE NUCLEAR PLANNING GROUP

In December 1966, the NATO Defence Planning Committee announced the setting up of "two permanent bodies for nuclear planning —a policy body called the Nuclear Defence Affairs Committee (NDAC), open to all NATO countries and, subordinate to it, a Nuclear Planning Group (NPG) of seven members which will handle the detailed work." This arrangement represented a compromise between U.S. Secretary of Defense McNamara and the smaller European Allies. McNamara was anxious to keep the new policy group as small as possible, both to minimize the security risks in handing very sensitive information and because he believed a smaller group would lead to a better quality of debate. The Europeans, led by the Dutch, were determined not to be treated as second-class citizens and were eager to be directly involved in discussions on such important matters.

To meet these European concerns, the NDAC was therefore established to allow every interested Ally the right of access to all the work undertaken by the NPG. The latter, although the more important body for all practical purposes, would formally report to the NDAC. In addition, the composition of the NPG itself at Ministerial level was to consist of seven members rather than the five originally proposed by McNamara. At the outset France, Iceland, and Luxembourg decided not to join the NDAC; Norway and Portugal joined but chose not to participate in the NPG. Thus the original ten participants in NPG were the same as the members of its precursor, the ad hoc Special Committee on Nuclear Consultation: Belgium, Canada, Denmark, FRG, Greece, Italy, Netherlands, Turkey, U.K. and U.S. Since its inception, the NPG has met twice a year at Ministerial level under the chairmanship of the Secretary-General. The original seven-member Group was made up of four permanent members: U.S., U.K., FRG, and Italy, and three rotational members. The rotational seats were filled by pairing Greece and Turkey; Belgium and the Netherlands; and Canada and Denmark. Each pair shared a seat on an "18 months on, 18 months off" basis, although the transition date for the Greece/Turkey seat did not coincide with that for the other two pairings (the Turks serving the first 9 months to complete a term reckoned to have started with their membership of the original "Special Group" that preceded the NPG). After about two years, the Norwegians decided to

participate and were then effectively paired with Denmark; the Canadians remained a rotating member on the same 18-month cycle, so that from 1970 the Group alternated between seven and eight members.

The rotational members accepted this arrangement with some reluctance, and their periods of participation at Ministerial level only served to increase their wish for full-time membership. After several attempts to widen the Group during the 1970s, it was finally agreed in November 1979 to abandon the rotational membership and permit all interested countries to participate in NPG Ministerial meetings. In 1980 Portugal also decided to exercise its option to join the NPG, and shortly afterward Luxembourg applied to join. The first meeting of the fully expanded group took place in November 1980. The current membership of the NPG thus consists of the Defense Ministers of all NATO countries save France (which does not participate in the Alliance Integrated Military Structure); Iceland (which has no defense forces and no Defense Minister); and Spain (which joined the Alliance in 1982 but arrangements have not yet been made for the the incorporation of Spanish forces into the Integrated Military Structure).

The end of the rotational system effectively marked the final demise of the NDAC, although it has not formally been disbanded. It had always been largely a cipher; brief meetings were held once a year immediately before the December Defence Planning Committee Ministerial meeting, and the most important NPG documents were still submitted to the DPC for approval. Even these meetings were quietly dropped in the mid-1970s. The NDAC had become redundant essentially because all the countries concerned participated in the regular meetings of the NPG at Permanent Representative level at NATO Headquarters in Brussels, and in the lower-level NPG Staff Group, in which much of the detailed work was carried out. (Originally, meetings of the Permanent Representatives were confined to those countries currently represented at the Ministerial Meetings, but membership was widened after a year to cover all NDAC members.) All countries thus had access to NPG papers, and the non-participating countries at Ministerial meetings were briefed afterward on the main points of the discussion.

Three features of the way in which the NPG operates distinguish it from other NATO committees.[1] First, in accordance with the original McNamara wish to keep the Group as small as possible, attendance at the Ministerial meetings themselves is restricted to a strict maximum of five from each country (typically, Minister of Defense, NATO

[1]A detailed account of the way in which the NPG operates can be found in R. E. Shearer, "Consulting in NATO on Nuclear Policy," *NATO Review*, October 1979.

Ambassador, Chief of Defense Staff, and two other officials). The International Staff is also limited to five (including the Secretary-General himself); the Major NATO Commanders (SACEUR, SACLANT, and CINCHAN) are in attendance but do not sit at the main table. Second, to emphasize the separate and distinctive nature of the Group, meetings are normally hosted by member countries on a roughly rotational basis rather than held at NATO Headquarters, and to emphasize the informality further, they often take place away from national capitals. Finally, many of the major NPG studies have been undertaken by ad hoc groups of experts from capitals with one of the member nations taking the chair, rather than by staff from the national delegations in Brussels under the chairmanship of a member of the International Staff.

Appendix C

THE GROWTH OF THE NATO THEATER NUCLEAR STOCKPILE

Theater nuclear weapons first became feasible as a result of weapon design work aimed at reducing the size and weight of warheads so that they could be carried by aircraft other than long-range heavy bombers. The first public references to the possibility of using these smaller warheads in "tactical" weapons appeared in 1949-50. By then it was becoming apparent that not only could the size of warheads be reduced but also the yield; in 1951 the first nuclear tests of devices with a yield of less than one kiloton were carried out. Although availability of fissile material was something of a constraint, a program to develop TNW moved sufficiently rapidly for the first operational weapon system, the 280mm atomic "cannon," to be deployed in Europe in October 1953. (Nuclear-capable bombers had been deployed in the United Kingdom for some years under an arrangement formalized in the Truman-Churchill agreement of 1952, but these were essentially strategic in character.) Within two years these had been supplemented by three surface-to-surface missile systems: Honest John, Corporal, and Matador. It is less clear when nuclear weapons were first deployed on dual-capable aircraft in Europe (other than long-range bombers), but the F-100 appears to have had a nuclear capability by 1955, and the F-101 by 1957.

Most of the TNW delivery systems now in the NATO inventory are direct descendants of systems that were deployed within the five years following the introduction of the first weapon in 1953. Leaving aside several systems that were deployed either in small numbers or for a short period of time, and also excluding British- and French-owned weapons, the following sequences can be identified (noting that there is often a considerable overlap between new systems and those they replace):[1]

[1]The data in this appendix derive from a variety of sources, including the annual U.S. Department of Defense Reports to Congress, U.K. Defence White Papers, and the IISS Military Balance. In addition to these standard reference sources, two publications containing particularly extensive references to unclassified information on NATO nuclear forces are T. Cliffe, *Military Technology and the European Balance*, Adelphi Paper No. 89, IISS, August 1972, and M. Leitenberg, "Background Information on Tactical Nuclear Weapons," Chap. I in *Tactical Nuclear Weapons: European Perspectives*, published by SIPRI in 1978.

- Artillery: 280mm (first deployed 1953) replaced by M110 8-inch howitzer (1956) and M109 155mm howitzer (1962). Both latter systems are still in service, although both the howitzers and the nuclear shells have undergone considerable modification and modernization.
- Short-range missiles: Honest John (1954) augmented by Sergeant (1962); both replaced by Lance (1973). Lance is still in service, together with a few Honest Johns operated by Greece and Turkey.
- Medium-range missiles: Matador (1954) replaced by Mace (1959), in turn replaced by Pershing I (1962). Pershing I is still in service but those in U.S. service are due to be replaced by an extended-range version (Pershing II) from 1983 onward, while those in service with the FRG may be replaced by a modernized version with a range similar to that of the present system.
- Medium-range aircraft: Over 20 dual-capable aircraft types with ranges of up to about 1500 km have been deployed by the Alliance, including the F-100 (1955), F-104 (1957), F-4 (1962—still in service), and F-16 (1978—but not yet deployed in a nuclear role in Europe). These have been equipped with a variety of free-fall bombs, the Walleye Glide Bomb and the Bullpup air-to-surface missile.
- Long-range aircraft: The B-47, which was phased out in 1963, was designated as a strategic system. However, the F-111, introduced in 1967 and still in service, is clearly regarded as having a theater role.
- Air defense missiles: The Nike-Hercules surface-to-air missile (1958) is still in service, but is due to be replaced by the conventionally armed Patriot system.
- Atomic demolition munitions: The Special and Medium ADMs were introduced in 1964 and 1965, respectively, and are still in service.

All the weapons now in the NATO inventory have thus either been in service since the 1960s (although in most cases both delivery systems and warheads have undergone modernization) or are replacements for earlier systems with essentially equivalent capabilities. The only systems deployed during the last thirty years that have been phased out without direct replacement are the Davy Crockett jeep-mounted infantry weapon, which had a very short range (2 to 4km) and very low yield, and the Thor and Jupiter long-range theater ballistic missiles, first deployed in 1958 and withdrawn in 1963-64. Since

the 1960s, NATO has relied on aircraft to provide a long-range theater capability, but long-range missiles will be reintroduced in 1983 with the deployment of Pershing II and ground-launched cruise missiles, as a result of the 1979 NATO decision to modernize its long-range theater nuclear forces.

It is difficult to be precise about the number of nuclear weapons deployed by NATO, since much of the information is classified. However, it is known that at the end of the 1950s the U.S. nuclear stockpile in Europe consisted of about 2500 warheads. A rapid expansion took place between 1963 and 1966, when the stockpile doubled from 3500 warheads to 7000. At that point U.S. Secretary of Defense McNamara, prompted by the deployment of increasing numbers of ADMs, imposed an arbitrary ceiling. The figure of 7000 was announced by McNamara in 1966 and remained largely unchanged (a figure of 7200 was quoted by McNamara's successor Clifford in 1968) until 1980, when, as a result of NATO's LRTNF modernization decision, 1000 warheads were withdrawn from the stockpile. These warheads are almost all intended for the TNF systems discussed in this report, although a small number are nuclear depth-bombs intended for carriage by maritime patrol aircraft.

Warhead numbers cannot be directly related to numbers of delivery systems for three main reasons. First, many delivery systems are dual-capable and not all are necessarily intended for a nuclear role (consequently, some may not be operated by nuclear-trained crews or have the necessary technical modifications for nuclear use). Second, some weapon systems are capable of delivering more than one warhead (aircraft can fly several missions and some can carry several weapons; howitzers and missile launchers may have a refire capability), so that several warheads may be allocated to a single delivery system. Third, to provide options for different types of use, it may be necessary to stockpile several warheads of different yields for use with the same delivery system, although this is becoming a less important factor with the recent advent of variable-yield-warhead weapons. At the time MC 14/3 was adopted, NATO (excluding France) had deployed about 1000 dual-capable aircraft (F-100, F-104, F-4, Canberra, and Buccaneer) and slightly over 1000 missiles and artillery systems (8-inch, 155mm, Honest John, Sergeant, Pershing). At the end of 1981 the figures were 850 aircraft (F-111, F-104, F-4, Vulcan, Jaguar, Buccaneer) and 1330 missiles and artillery (Pershing, Lance, Honest John, 8-inch, 155mm). It can therefore be seen that over the last fifteen years the NATO theater nuclear stockpile has not changed significantly in either types of weapons or number of delivery systems, while the number of warheads has decreased by almost 20 percent.

The above figures exclude sea-based theater nuclear forces and nuclear depth-bombs carried by maritime patrol aircraft. Most of these systems are specifically intended for maritime use, although the U.S. A-6 and A-7 aircraft based on carriers in the Mediterranean also have a land-attack capability. The figures also exclude French forces. France deploys S3 IRBMs; Jaguar, and Mirage IIIA and IV aircraft; and Pluton short-range missiles, all with a nuclear capability (although the French government regards the S3 missiles and Mirage IVs as having a strategic role). The warhead total also excludes U.K. warheads. Although the U.K. operates 8-inch and 155mm howitzers and Lance missiles with U.S. warheads under dual-key arrangements, the Vulcan bomber (being phased out in 1982) and Jaguar and Buccaneer aircraft carry British-owned free-fall bombs. The number of warheads in the U.K. theater stockpile has never been disclosed, but it is small compared with the U.S. total.

Finally, although this report is concerned principally with NATO nuclear forces, it is relevant to comment briefly on the Warsaw Pact's theater nuclear capability. In terms of types of systems, this has shown two main differences from NATO. First, the Soviet Union has consistently deployed very substantial numbers of long-range systems, both missiles (SS-4, SS-5) and aircraft (Badger, Blinder); both categories have recently been augmented by the SS-20 IRBM and the Backfire bomber. Over the last twenty years the total number of such systems has averaged about 1000, compared with a NATO average of less than 200. Second, at the shorter ranges the Warsaw Pact has put much greater emphasis on missiles than on artillery; while several hundred Frog rockets have been deployed since the 1960s, the 203mm howitzer and 240mm mortar are believed to have been given a nuclear capability only within the last few years.

The size of the Warsaw Pact theater nuclear forces has also grown considerably over the last decade, while NATO's has remained almost static. A frequently quoted figure suggests that the Soviet Union deploys 3500 nuclear warheads. However, this figure appears to have originated in a 1968 report to the North Atlantic Assembly (a body of Parliamentarians that does not normally have access to classified information), and almost certainly refers to nuclear-capable delivery systems, not warheads. At that time, the Soviet Union deployed about 600 long-range theater missiles (SS-4/SS-5); 500 long-range bombers (Badger, Blinder); 1500 medium-range aircraft (Fitter, Flogger, Fishbed, Brewer), and about 850 medium- and short-range missiles (Frog, Scud, and Scaleboard), totaling approximately 3450. The IISS Military Balance of 1970/71 quoted the figure of 3500, but referred to warheads rather than delivery vehicles. In fact, even with access to

intelligence sources, it is almost impossible to estimate accurately the total number of warheads available to Warsaw Pact forces without direct inspection of nuclear storage facilities. (The need for on-site inspection to verify warhead numbers would be a major obstacle to any arms control agreement aimed at limiting nuclear weapons that are dual-capable.) The Warsaw Pact theater nuclear armory had grown by the end of 1981 to about 4500 delivery systems: 500 long-range missiles, 350 long-range aircraft, 650 medium-range missiles, 2000 medium-range aircraft, and 950 short-range missiles and artillery.[2] In addition to the quantitative increase, the quality of the Warsaw Pact forces has been substantially enhanced by the introduction of such new missiles as the SS-20, 21, 22, and 23, and such aircraft as Backfire and Fencer.

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[2]A summary of the balance of land-based theater nuclear forces in Europe at the end of 1981 is given in the 1982 United Kingdom Statement on the Defence Estimates (Cmnd 8529, June 1982), Fig. 7. More detailed (but less clear) information is contained in *NATO and the Warsaw Pact-Force Comparisons*, published by NATO in April 1982.

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