



ORGANISATION DU TRAITE DE L'ATLANTIQUE NORD

NORTH ATLANTIC TREATY ORGANIZATION **NATO**

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N A T O S E C R E T

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To: Permanent Representatives of Belgium
 Canada
 Denmark
 Federal Republic of Germany
 Greece
 Italy
 Luxembourg
 Netherlands
 Norway
 Portugal
 Turkey
 United Kingdom
 United States

From: Acting Secretary General

NUCLEAR PLANNING GROUP

HIGH LEVEL GROUP REPORTS

The North Atlantic Council at their meeting in Rome on 4th and 5th May, 1981 requested and Defence Ministers at their Defence Planning Committee meeting in Brussels on 12th and 13th May endorsed that, as a matter of immediate priority, an updated Alliance threat assessment and a study of functional requirements for NATO theatre nuclear forces be undertaken within the framework of the Special Consultative Group and the Nuclear Planning Group (NPG) High Level Group.

2. The NPG High Level Group has completed its work and the requested reports are attached. After the NPG Ministerial meeting later this month, I would plan to circulate these reports to all NATO Foreign and Defence Ministers concerned, as well as to members of the Special Consultative Group.

(Signed) Eric da RIN

This document consists of:

- cover note of 1 page
- covering letter of 1 page
- Annex I of 41 pages
- Annex II of 31 pages

This cover note may be downgraded to NATO RESTRICTED when separated from attachments.

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NATO SECRET

ASSISTANT SECRETARY OF DEFENSE
WASHINGTON, D.C. 20301



INTERNATIONAL
SECURITY POLICY

PO/81/110
October 2, 1981

His Excellency
Joseph M.A.H. Luns
Secretary General
North Atlantic Treaty Organization
Brussels

Dear Mr. Secretary General:

As you know, at their May Ministerial meetings, NATO Foreign and Defense Ministers, in welcoming the intention of the United States to begin negotiations with the Soviet Union on TNF arms control, requested the preparation of an updated Alliance threat assessment and a study of functional requirements for NATO TNF on which these negotiations could rely. Pursuant to this mandate, the Nuclear Planning Group's High Level Group undertook the preparation of these studies. We have met five times since May to complete this task, on a priority basis, to support preparations for the negotiations. I have the privilege as Chairman to transmit the completed papers of the High Level Group.

You will understand that the Dutch Representative has reserved his position on the functional requirements paper in order to allow for a review by the new Netherlands Government. I would appreciate your transmitting these, through Permanent Representatives, to Foreign and Defense Ministers for their consideration.

The High Level Group is available to continue its work by providing assessments of possible changes in TNF levels and postures on Alliance security as they might be affected by these negotiations. This work will take place in conjunction with the work of the Special Consultative Group. With completion of the attached papers, the High Level Group also intends to proceed with its mandate to examine NATO's theater nuclear force posture.

I am forwarding copies of this letter and the papers to all High Level Group delegations.

Sincerely,

Richard Perle
Chairman
High Level Group

Attachments

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NUCLEAR PLANNING GROUP

HIGH LEVEL GROUP

THREAT ASSESSMENT

September 1981

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EXECUTIVE SUMMARY

GENERAL

1. This paper fulfills the Spring 1981 Ministerial mandate for an updated threat assessment as part of the preparatory work for theater nuclear forces (TNF) negotiations with the Soviet Union. It focuses on the full spectrum of the Soviet/Warsaw Pact threat to provide a basis for understanding the interrelationships among the various classes of weapons systems. While not meant to be a net assessment, some general comparisons with NATO forces are made.

2. Since 1965 there has been an across-the-board expansion and modernization of all Soviet forces. This trend is expected to continue despite Soviet economic, energy, and demographic problems. The Soviet Union views the use of military might as more than a policy instrument of last resort. Accordingly, it gives priority of resources to military requirements to support an ambitious military doctrine calling for preponderant forces geared to offensive operations.

3. Soviet doctrine stresses the ability to fight at any level of warfare, ranging from conventional to strategic nuclear. While acknowledging the possibility that a war in Europe could begin with a conventional phase, the Soviet Union is prepared to fight a theater nuclear war at varying levels of intensity; apparently, the Soviets perceive escalation to global nuclear war as not unlikely. Soviet weapons systems, developed in support of their doctrine, pose a serious threat to NATO in general, and to NATO theater nuclear forces in particular, since Soviet strategy stresses the early neutralization of NATO's nuclear forces. Understanding this threat requires knowledge of the entire spectrum of Warsaw Pact military capabilities.

TNF THREAT

4. The Soviet Union has amassed an impressive long-range theater nuclear force (LRTNF). They have continued their

deployment of the SS-20 mobile, intermediate-range ballistic missile at a steady rate. This highly survivable missile, with three independently targetable warheads and greatly improved accuracy, represents the major long-range nuclear threat to NATO Europe and a significant change in the nature of the threat. As of August 1981, the Soviet Union had deployed 252 SS-20 operational launchers, with 756 warheads. While an additional nine SS-20 sites with 81 launchers are currently under construction, we have no hard evidence that would enable us confidently to predict the eventual size of the SS-20 force. Moreover, there is evidence that the Soviets are now deploying one refire missile per operational launcher; and we cannot rule out the prospect that they eventually will deploy an additional one or two refires per launcher when the total SS-20 launcher deployment is complete. The more vulnerable, single warhead SS-4 and SS-5 missiles are being withdrawn as the SS-20 comes into the force, but we are uncertain about the future rate of deactivation of these older missiles. They still comprise some 350 launchers targeted on Western Europe.

5. The Soviet long-range nuclear air threat opposite Europe consists of some 375 older BADGER and BLINDER and some 55 modern BACKFIRE bomber aircraft. The introduction of BACKFIRE bombers is revitalizing the aging long-range theater nuclear bomber force through significant qualitative improvements in range, pay load, and penetrating capabilities. Having sufficient range capability to strike just about all of European NATO from bases in the USSR, the Soviet force of long-range aircraft would be used during both the conventional and nuclear phases of a war to attack targets deep in NATO with emphasis on destroying NATO's nuclear assets. In addition, about 300 long-range nuclear aircraft are assigned to Soviet naval aviation units. Those naval aircraft pose a serious threat to Allied warships and to shipping essential to NATO's wartime reinforcement. Currently, the Soviet LRTNF capability far exceeds that of NATO; and the Soviet Union will maintain a large margin of superiority even after NATO's modernization decision is implemented.

6. Soviet medium- and short-range TNF, like their LRTNF counterparts, have been the subject of broad and intensive modernization and expansion programs, providing Soviet ground force commanders with a nuclear inventory that is increasingly flexible, effective, ready, and survivable.

The Soviets have developed and are deploying new land-based systems to replace or expand their current inventory of land-based missiles/rockets. Among these are the SS-21 replacement for the short-range FROG, the SS-X-23 for the SCUD-B, and the SS-22 for the SCALEBOARD. The added range and/or accuracy of these systems increases Warsaw Pact coverage of NATO targets and enhances survivability of Warsaw Pact systems. Practically all of European NATO's land area, for example, could be targeted by highly mobile SS-22's, deployed forward or in motion with advancing Soviet divisions. Even the new SS-X-23, when moving with frontal forces, can acquire substantial target coverage with the advance of Soviet forces. In addition, since 1973, the Soviets have developed and deployed nuclear-capable artillery--203mm Howitzers and 240mm mortars--and are now deploying self-propelled versions of these systems. All of these systems are highly mobile and have a refire capability.

7. Numerically, Warsaw Pact tactical aircraft constitute the single most significant part of their nuclear-capable forces, with approximately 2250 ground attack aircraft being assigned a primary nuclear role. The bulk of these consist of late model SU-24 FENCER's, FITTER's, and MIG-27 FLOGGER's, which have the capability to deliver nuclear weapons under all weather conditions and at greater ranges than previous generations of Soviet tactical aircraft. The Warsaw Pact has a significant numerical advantage in medium-range TNF.

8. In sum, the qualitative improvements flowing from the comprehensive Soviet TNF modernization programs give the Soviets multiple, redundant, and highly flexible theater nuclear options for targeting NATO's currently deployed TNF and a wide range of other targets. In particular, greater accuracy and smaller yields permit more discriminating use, less collateral damage, and higher damage expectancy against targets in the NATO area.

CONVENTIONAL THREAT

9. Over the last 15 years, the Warsaw Pact has undergone significant improvements in both quantity and quality of its conventional military forces. The result has been the development of a very large, highly mobile, combined arms force, which is offensively oriented, capable of sustained operations, with the probable strategic goal of isolating

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and defeating NATO forces in place before NATO can mobilize and bring its considerable economic potential to bear. Soviet/Warsaw Pact increases in equipment over this period have ranged from 30 percent for the number of tanks to more than 100 percent for armored fighting vehicles. Even more importantly, qualitative improvements have greatly enhanced force mobility, firepower, and survivability. Moreover, supporting air forces have been similarly improved, to include new precision-guided air munitions, improved on-board navigation systems, and low altitude intercept capabilities, as well as greater combat radius and pay load. In short, the Warsaw Pact has supplemented traditional numerical advantages by significantly enhancing the quality of its forces. By any measure, the Warsaw Pact possesses conventional forces, which are far larger than those needed for defensive purposes.

STRATEGIC FORCES THREAT

10. The vitality seen in Soviet programs to enhance their conventional and theater nuclear forces is also clearly evident in Soviet programs to strengthen their intercontinental attack forces. The steady growth in the number and quality of intercontinental delivery vehicles has been accompanied by dramatic increases in accuracy and the number of deliverable warheads--from a few hundred in 1965 to about 6700 today. The Soviets have vastly increased their capability to attack hard targets since the late 1960's to the point where the survivability of US land-based missiles has been gravely threatened. Similar improvements in the Soviet submarine-launched ballistic missile (SLBM) program, to include longer-range SLBM's with a multiple independently targetable reentry vehicle (MIRV) capability, allow the Soviet Union greater employment flexibility and enhanced survivability. Increases in the number of nuclear-powered ballistic missile submarines (SSBN's) on patrol in the Atlantic and Pacific have enhanced Soviet capability to attack US bomber bases and command and control facilities with the short warning normally associated with the flight times of SLBM's. In addition, the Soviets continue to improve their strategic defense capabilities through vigorous modernization and extremely active research and development programs in the fields of anti-air, anti-missile, and anti-satellite systems. As a result of this relentless growth in strategic programs, the USSR has

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achieved nuclear capabilities that are widely perceived to be at least equal to those of the United States and superior to them in several crucial respects.

CONCLUSIONS

11. This threat assessment provides information on the development and deployment of a wide variety of new Soviet nuclear forces, but it does not include projections of future force levels. While there are uncertainties in such projections, an examination of the trends in Soviet force development to date and the magnitude of the current threat leaves no doubt about the vigorous nature and dangerous implications of Soviet nuclear force modernization for the Western world. We must not lose sight of the fact that, if current trends continue into the 1980's, the Soviets, in addition to their SS-20 deployment, will produce annually about 30 BACKFIRE aircraft, 1000 new nuclear-capable tactical aircraft, and some 1000 new strategic warheads, many with a hard-target kill capability. The meaning of the trends in Soviet capabilities is clear. Soviet capabilities across the board have been expanding and will continue to expand. The Soviet Union has military capabilities already far in excess of any legitimate defense needs. If current trends continue, the Soviets could attain military superiority permitting them successfully to exert political pressure in peacetime and during crises with confidence in their ability to prevail against NATO should conflict occur. If NATO is to preserve a credible deterrent in the face of this fundamental challenge to its security, it will require a sustained and effective response adequate to the challenge in line with Alliance strategy.

THREAT ASSESSMENT

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I. INTRODUCTION

BACKGROUND

1. NATO Ministers, at the May 1981 North Atlantic Council meeting, expressed the need for an updated threat assessment and a study of the Alliance's theater nuclear forces (TNF) functional requirements as preparatory work for TNF negotiations with the Soviet Union.

PURPOSE

2. This paper is intended to fulfill the Ministerial mandate for an updated threat assessment, which can be used as a common base for future High Level Group (HLG) deliberations on NATO's TNF functional requirements. The data are consistent with MC 161/81.

FOCUS

3. The paper focuses on the full spectrum of the threat-- levels of defense spending, doctrine, TNF, conventional, and strategic nuclear. This is necessary to understand fully the implications for NATO's TNF functional requirements because of the interrelationships among various classes of systems and the strong linkages between NATO's Triad of forces.

EVIDENCE

4. The evidence to support the judgments and conclusions regarding the size and the nature of the Soviet/Warsaw Pact threat to NATO comes from a variety of human and technological sources. We are confident that the evidence is sound and supports the information and estimates contained in this paper.

II. THE THREAT

OVERALL LEVEL OF SOVIET DEFENSE SPENDING

5. For more than two decades, the USSR has been engaged in a major buildup of its military forces. Since 1964, there has been an across-the-board expansion and modernization of all Soviet forces. Despite changes in the international

environment and Soviet espousal of a policy of detente, the overall pace of the Soviet military buildup has remained steady. Annual Soviet military spending has nearly doubled in real terms, and now consumes over one-eighth of GNP. The latest estimates in constant ruble prices indicate that Soviet defense spending has grown an average of four to five percent a year since at least 1965. During most of this period, defense spending probably accounted for a constant 11 to 13 percent of Soviet GNP, because defense and the economy were growing at about the same rate.

6. In the future, we expect the Soviet economy of the 1980's to be very different from that of the 1970's. Over the next several years, developing demographic and energy problems will combine with difficulties of longer standing to slow the rate of growth. The annual growth increments in the 1980's will be smaller than in most of the 1970's. Soviet leaders will have to make tougher choices among defense, investment, and consumption. The political competition for resources is likely to become more intense.

7. Despite these bleak economic prospects, however, we have yet to see any evidence of a shift of resources away from the defense sector. On the contrary, evidence of weapons production and testing as well as construction growth of defense industries and military R&D facilities suggest continued real growth in Soviet defense spending during the 1980's.

a. If Soviet defense spending continues growing at or near its historic rate of four to five percent a year and economic growth continues to slow down, the share of GNP taken by defense would steadily increase and could amount to 15 percent by 1985. Indeed, this trend appears to have already begun. Between 1979 and 1980, the defense share of GNP increased by a percentage point to 12-14 percent.

b. The Soviet Union views the use of military might as more than a policy instrument of last resort. This attitude has been embodied in and reinforced by a political and economic system that gives priority to military requirements, and by an ambitious military doctrine that calls for preponderant forces geared to offensive operations.

WARSAW PACT DOCTRINE

8. During the late 1950's and early 1960's, Soviet military thinking held that a war between NATO and the Warsaw Pact would automatically escalate to theater-wide nuclear war and to global nuclear war immediately thereafter. Over the past 10 years, however, the concept of war without immediate use of nuclear weapons appears to have gained acceptance. The requirement to be prepared to conduct nuclear and non-nuclear operations is clearly reflected in the composition of Soviet forces and in their training.

9. During the conventional phase of a war, attacks against NATO's nuclear capability would receive priority. If NATO were viewed by the Soviets as preparing to launch nuclear strikes, the Soviets would seek to preempt. (This underscores the importance of highly survivable NATO TNF.) Although they stress the importance of discerning NATO's intentions, the Soviets, if they decide to persist, have developed options for immediate response or for delaying and calibrating their response depending upon the size of NATO's nuclear strike. The Soviets now are better able to conduct theater nuclear war at varying levels of intensity. Escalation to global nuclear war, however, is apparently still perceived as not unlikely.

10. The Pact's success in achieving its wartime objectives would depend on the Soviet's ability to control and coordinate multi-national, large-scale conventional operations and to launch timely theater nuclear strikes if necessary. Recognizing the operational impact of an effective command, control, and communications (C³) system, the Soviets have long sought to improve the Pact's C³ capability to fight, survive, and reconstitute command of Pact forces. These efforts have included the construction of a system of hardened command posts, the expanding use of mobile command posts, and the use of redundant, hardened communications systems. On balance, we believe the Pact C³ system has important combat strengths allowing Soviet control of almost all aspects of Pact operations, a significant degree of flexibility in resubordinating forces from one command to another, and a high degree of communications security as well as command and control system survivability.

11. Many of the weapon systems the Soviets have developed in support of this military doctrine are capable of a broad range of missions, from deep interdiction of the enemy rear area to close support of tactical commanders. Similarly, many of these weapon systems can be used in either conven-

tional, nuclear, or chemical roles. Although this paper refers to theater nuclear, conventional, and strategic forces, NATO recognizes, as the Soviets clearly do, that virtually all of the Soviet systems pose a potentially serious threat to NATO in general and to NATO TNF in particular, since Soviet strategy stresses the early neutralization of NATO's nuclear assets. Understanding this problem requires a view of the entire spectrum of the Warsaw Pact threat.

THEATER NUCLEAR FORCES THREAT

GENERAL

12. Warsaw Pact TNF represent the focal point of HLG deliberations concerning the overall threat. For the purposes of this paper, it is useful to break the Soviet TNF threat into three general categories, each of which has somewhat different political/military properties. These categories are illustrative for purposes of this assessment and in no way prejudice range definitions which might be applied in negotiations involving TNF. The categories are:

-- Short-range TNF, consisting of systems capable of striking only those targets that are in the general region of the battlefield (illustratively with ranges less than 150km).

-- Medium-range TNF, consisting of those systems with a capability to hit targets in NATO territory beyond the general area of the battlefield but without a clear military capability to strike deep targets from the USSR (illustratively with ranges between 150km and 1500km).

-- Long-range TNF (LRTNF), consisting of those systems with an unambiguous military capability to strike targets in Western Europe from bases in the Soviet Union (illustratively with ranges in excess of 1500km but not included in previous SALT agreements).

SOVIET LAND-BASED LRTNF MISSILES

13. The Soviet land-based long-range theater nuclear missile force now consists of a shrinking SS-4 medium-range ballistic missile (MRBM) and SS-5 intermediate-range

ballistic missile (IRBM) force and the new and growing SS-20 force. As shown in Figure 1 in the annex, the MR/IRBM force remained relatively constant through the 1970's with between 500 and 600 launchers deployed. Even with the deployment of the SS-20 starting in 1977, the number of MR/IRBM launchers in the force has stayed around 600 as some SS-4's and SS-5's have been dismantled, although there has been a slight decline in the number of launchers deployed opposite NATO during the past decade. The decline is more than compensated for, however, by an increase in the number of deliverable weapons opposite NATO.

14. While we have no hard evidence of the eventual size of the SS-20 force, as of August 1981, 28 SS-20 bases with 252 launchers were operational and nine additional bases with 81 launchers were under construction. In addition, based on storage capacity and other factors, there is evidence that the Soviets deploy one refire missile with each launcher as it becomes operational. We also cannot rule out the prospect that an additional one or two refire missiles per launcher will eventually be deployed after the entire SS-20 force has become operational. Refire capability coupled with the high mobility and survivability of the SS-20 greatly increases the overall theater nuclear potential of the Soviet Union. As shown in Figure 3 in the annex, the increased range of the SS-20 allows basing beyond the Urals, with no degradation in target coverage.

15. On occasion, the Soviets have stated that they are merely replacing older missile systems with the SS-20. Not only does this disregard the three warheads carried by each SS-20, as well as other qualitative improvements (e.g., delivery accuracy, improving approximately from 2300 meters for the SS-4's to 285 meters for the SS-20), but it also ignores the fact that there are still about 350 SS-4 and SS-5 launchers deployed today. The remaining 35 SS-5 launchers will probably be deactivated in the next year or so. The rate at which the remaining SS-4 launchers will be deactivated is somewhat uncertain. While SS-4's and SS-5's lack the accuracy to be used effectively in a counterforce role and have slow reaction times, they are still effective against a variety of larger targets, including airfields, air defense networks, ports, and industrial facilities. The principal drawback to the older MR/IRBM force is its vulnerability to attack by US ICBM's, POSEIDON missiles, and long-range aircraft. Of some 350 SS-4's and SS-5's in the force today, less than 100 of these launchers are in hardened

silos. Moreover, even these silo-based SS-4's and SS-5's are clustered in groups of three to four silos that represent single aimpoints. (Qualitative trends in Soviet and NATO long-range TNF land-based missiles are shown in Figure 2 in the annex.)

16. The introduction of the SS-20 into the force significantly increases the survivability of the Soviet LRTNF ballistic missile force:

-- Mobility not only increases survivability but in turn increases refire potential as well as the viability of withholding nuclear systems based in the Soviet Union.

-- Launch from garages with retractable roofs permits their use in a launch-on-tactical-warning mode.

-- As shown in Figure 3 in the annex, the range of the SS-20 allows basing beyond the Urals, providing some additional protection from conventional attack with no degradation in target coverage; and even from Soviet bases well east of the Urals--which are almost certainly intended for coverage of the Far East--SS-20 launchers could be retargeted on several NATO countries. SS-20 units furthest to the east could be transported within range of Western Europe within a matter of days. (Figure 4 in the annex displays the deployment and coverage of the entire SS-20 force.)

Thus, while Soviet discussions of "medium-range rockets" tend to center on those deployed in the European USSR--certainly the bulk of the force which is clearly intended for coverage of NATO--we cannot ignore the potential represented by the technical characteristics of the SS-20.

LONG-RANGE NUCLEAR STRIKE AIRCRAFT

17. In addition to the BEAR and BISON long-range bombers that are primarily intended for intercontinental strike missions, the Soviets currently have in their inventory three aircraft capable of carrying out theater nuclear strikes to ranges in excess of 1500km on radius missions. BADGER, BLINDER, and BACKFIRE bombers are assigned to both long-range aviation (LRA) and Soviet naval aviation (SNA). (A major reorganization within the Soviet armed forces is

underway that will substantially affect the organizational status of the LRA and other services. This paper does not take account of these changes.) Those assigned to LRA are assessed to have predominantly a land attack mission, either conventional or nuclear. During the conventional phase of an East-West conflict, they would be used in large numbers against airfields, nuclear storage facilities, command and control facilities, and other targets with the primary objective of reducing NATO's nuclear attack capabilities and achieving air superiority. During the nuclear phase, these aircraft would conduct nuclear attacks designed to complement strikes by ballistic missiles. They would probably be used primarily against those targets that did not pose an immediate strategic threat to the USSR, such as troop concentrations, storage facilities, and industrial centers, thus freeing the ballistic missile forces to concentrate on time-urgent targets. LRTNF bombers assigned to SNA are assessed to have predominantly an anti-shipping mission, posing a serious threat to Allied warships and NATO's war-time reinforcement.

a. Currently there are some 235 BADGER strike aircraft (bombers and air-to-surface missile carriers) that are assigned to 10 LRA bases located in the western USSR. The BADGER has been in the operational force since 1954. There are another 80 LRA strike BADGER's deployed in the eastern USSR. In addition, there are some 85 non-strike BADGER aircraft (tankers, reconnaissance, and electronic countermeasures support aircraft) attached to the LRA in the west. SNA has some 200 strike BADGER's deployed in the west and another 100 in the Far East. There are also about 160 non-strike BADGER's assigned to SNA.

b. The TU-22 BLINDER, which has a supersonic dash capability, became operational some 20 years ago. The BLINDER was deployed only to bases in the western USSR, and currently some 200 BLINDER's are deployed. One hundred fifty-five BLINDER's are assigned to five LRA bases and 45 to two SNA bases. Of this total, about 20 are assessed to be non-strike reconnaissance aircraft.

c. The BACKFIRE, which became operational seven years ago, represents a significant improvement over the BADGER and BLINDER in range, pay load, and penetration capabilities. Thus far, only BADGER units have received BACKFIRE aircraft--the total BADGER count force-wide, however, has decreased only slightly. LRA and SNA each currently have

BACKFIRE's deployed to two operational bases and a training facility for a total of six bases in the western USSR. Currently some 115 BACKFIRE's are deployed in the west, with 55 assigned to LRA and 60 to SNA. There are an additional 30 LRA and 15 SNA BACKFIRE bombers in the eastern USSR. (Figure 5 in the annex shows the qualitative and quantitative trends in Soviet and NATO long-range TNF aircraft.)

d. The BADGER, BLINDER, and BACKFIRE have sufficient range capability to strike just about all of European NATO from their operating bases in the Soviet Union.

MEDIUM- AND SHORT-RANGE TNF

18. Soviet medium-and short-range TNF, like their LRTNF counterparts, have been the subject of broad and intensive modernization and expansion programs. The evidence available indicates that the nuclear weaponry available to Soviet and non-Soviet Warsaw Pact ground force commanders has undergone and will continue to undergo important changes through the mid-1980's. Some of these changes reflect the evolutionary development of existing weapons systems, including the expansion of the number of launchers per unit or their replacement by more modern follow-ons. Other changes involve the introduction of new categories of weaponry, but all will contribute to developing a ground force nuclear inventory that is more flexible, effective, ready, and survivable.

19. In terms of evolutionary developments, since the 1960's, Soviet and non-Soviet Warsaw Pact forces have been fielding the present FROG-7 rockets and SCUD B missile systems to replace earlier, shorter-range versions of these systems. These systems have ranges of about 70km and 300km respectively. In addition, the Soviets have increased the number of battalions or brigades containing these systems and--even more important--have markedly expanded the number of launchers assigned to such units. For example, since the early 1970's, the number of launchers in Soviet front-line SCUD brigades in East Germany have reportedly expanded from 9 to 18 launchers per brigade. Such evolutionary changes will continue at differing rates throughout the Warsaw Pact.

20. Recently, the Soviets have begun fielding an entirely new family of short- and medium-range missiles for their ground forces with the aim of improving the range, accuracy, and responsiveness of this force as a whole and increasing its utility in conventional as well as nuclear operations. The first of the new missiles was the SS-21, which we believe was designed to replace the FROG-7 rocket systems assigned to motorized rifle and tank divisions. Thus far, the SS-21 has been fielded only in limited numbers in the USSR, but its introduction with Soviet forces in East Germany (i.e., Group of Soviet Forces, Germany [GSFG]) could occur at any time. The SS-21, with nuclear, chemical, and conventional warheads, including a high explosive cluster munition, represents a significant improvement in accuracy and range in comparison to the unguided FROG system. Its amphibious launcher and resupply vehicle give it better cross-country mobility. The added range and accuracy will:

- Triple the area in which NATO targets can be struck.
- Increase survivability by permitting the launchers to remain farther to the rear.
- Increase the single shot kill probability against various targets, thus reducing the need for allocating multiple strikes against a single target.
- Permit the use of nuclear warheads with lower yields, thus permitting the Soviets to conduct nuclear strikes in the proximity of their own forces.

21. The next new missile that has been introduced is the SS-22, the follow-on to the front level SS-12 SCALEBOARD. No SCALEBOARD or SS-22 launchers are believed to be located in Eastern Europe--nor are they expected to be in the foreseeable future--but we estimate that six SCALEBOARD or SS-22 units with about 70 launchers are part of the forces in the USSR earmarked for wartime use against NATO. Externally, the two systems appear identical, but the SS-22 is significantly more accurate than the SS-12. Even without moving forward, the SS-22 system, if launched at maximum range from sites in the western USSR, could conduct accurate nuclear fire--or possibly conventional strikes--into NATO territory, including parts of Norway, the Federal Republic of Germany, Greece, and Turkey. Furthermore, the long range of the SS-22--more than 900km--means that it could operate effectively deep in the rear of a Soviet front, which would make it difficult for NATO forces to locate and destroy.

22. The SS-X-23 is the apparent replacement for the army and front level SCUD B. The SS-X-23's use of solid propellant permits increased readiness in comparison to the liquid-fueled SCUD B. In addition, the missile's greater range and accuracy and its amphibious launcher and resupply vehicle provide virtually identical improvements in the tactical missile support at army or front level to those provided by the SS-21 at division level. Fielding of the SS-X-23 is expected to begin this year in the USSR. It is also possible that it will be deployed with Soviet troops in East Germany. If forward deployed in time of crisis, the SS-X-23, fired to a maximum range of 550km, could strike deep targets in NATO.

23. Since 1973, the Soviets have added a significant new category of battlefield nuclear weaponry to their inventory with the introduction of nuclear-capable artillery units. Each of the existing 12 or so units at full strength has 24 203mm howitzers and 24 240mm mortars. Older nuclear-capable towed artillery pieces in these units gradually are being replaced by self-propelled versions, which will provide increased mobility, greater rate of fire, and longer range. In addition, the new self-propelled pieces will be able to move rapidly to a new firing position after each mission, which will greatly lessen their vulnerability to NATO counter battery fire. Furthermore, the necessary support and pre-fire preparations for these systems are minimal compared to those required for missiles and rockets. Thus far, nuclear artillery units have only been confirmed in the USSR, but their deployment in the GSFZ could occur at any time. The Soviets have at least seven nuclear-capable artillery units earmarked for operations against NATO, and some small expansion of this number is expected by 1985.

24. The actual nuclear strike potential represented by these systems is substantially higher than the total number of launchers if refire capabilities are taken into account. These could consist of as many as three additional rockets per FROG launcher, one additional missile for each SCUD and SCALEBOARD launcher, and one or two additional missiles per SS-21 launcher.

25. With these nuclear-capable ground force systems, the Soviets could strike NATO targets immediately in front of their position and out to a distance of about 900km. Deeper NATO targets, such as advancing reserves, could be targeted by LRTNF or by intercontinental strike forces possessed by

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the Soviet rocket forces. Soviet ground force nuclear systems are designed to destroy both large fixed (e.g., an airfield) and small mobile (e.g., a tactical command post) targets.

NUCLEAR CAPABLE TACTICAL AIRCRAFT

26. Numerically, tactical aircraft constitute the single most significant part of Warsaw Pact nuclear-capable forces. Of the 9550 fighter type aircraft in Soviet and other Warsaw Pact combat units, some 5700 are capable of delivering nuclear weapons. However, of these aircraft, approximately 60 percent are in fighter or reconnaissance units that devote most of their training to their primary air-to-air and reconnaissance missions with only a small part, if any, of their training going to nuclear delivery. Soviet planning clearly earmarks these fighter and possibly the reconnaissance forces for secondary or backup roles in nuclear delivery. This leaves approximately 2250 ground attack aircraft, including 1500 opposite NATO, with a primary nuclear role. The bulk of these consist of three late model types: SU-24 FENCER's, late model FITTER's, and MIG-27 FLOGGER's. (Figures 6 and 7 in the annex illustrate trends in Warsaw Pact and NATO medium-range nuclear-capable and nuclear role aircraft.)

a. The SU-24 FENCER, first operational in 1974, is assessed to have a deep strike interdiction role and is capable of delivering nuclear bombs under all weather conditions. While the FENCER has the capability to strike targets at ranges beyond 1500km, its range is considerably reduced on its normal operational (low-altitude) flight profile and, hence, it is included here as a tactical aircraft. Of 450 in the inventory, about 260 are currently at seven bases in the western USSR. The FENCER, depending on its weapons configuration, can strike virtually all of the NATO area, excluding France, the United Kingdom, and Portugal, from its bases in the Soviet Union, and, with deployment forward in Eastern Europe, would cover approximately the same targets as BADGER and BLINDER. The initial deployment of FENCER aircraft to Eastern Europe appears to be underway.

b. The late model FITTER is a variable-geometry wing derivative of the SU-7 FITTER A, first deployed in 1960. Of the 750 in combat units, about 480 are in units in the west with the rest along the Sino-Soviet border region.

Currently only one non-Soviet Warsaw Pact nation (Poland) has a variant of this aircraft. This variant is assigned to a single unit that might have a nuclear delivery role.

c. The MIG-27 FLOGGER is an outgrowth of the air superiority MIG-23 and, although quite similar in appearance to the MIG-23, has vastly different avionics. Its avionics are optimized for ground attack. Like the late model FITTER, the MIG-27 has some capability to deliver weapons under all weather conditions. Of the 550 aircraft in the inventory, approximately 370 are in the west. Three non-Soviet Warsaw Pact countries (Bulgaria, East Germany, and Czechoslovakia) have variants of the ground attack FLOGGER in their national forces. Two units in Czechoslovakia and possibly one in East Germany appear to have nuclear roles.

d. During the conventional phase of a war in Europe, most tactical aircraft would be committed to the air operation or support of Pact ground forces. During the initial nuclear strike, Warsaw Pact tactical air assets probably would be used for both the close air support and deep interdiction roles as tactical circumstances dictate. The Soviets probably would place increased reliance on air-delivered weapons during subsequent nuclear operations, when the effectiveness of NATO air defense systems presumably would be reduced.

NATO WARSAW PACT TNF COMPARISONS

27. As the threat data indicate, Warsaw Pact TNF programs are characterized by dynamic activity across the board. With the exception of nuclear-capable short-range artillery systems, the Warsaw Pact enjoys a significant quantitative advantage across the entire spectrum of theater nuclear systems. It has also substantially narrowed the qualitative advantage in TNF that NATO formerly enjoyed. The static comparison of long-, medium-, and short-range systems shown in the appendix illustrate the trends in NATO-Warsaw Pact TNF. The graphs do not include naval systems on either side, any French systems, or the British POLARIS force. Briefly summarized:

-- As shown in Figure 8 in the annex, the Warsaw Pact enjoys an approximately 4.4:1 advantage in long-range nuclear-capable delivery systems. When warhead loadings for

these systems plus missile refires are compared, the Warsaw Pact advantage increases to approximately 7:1. Soviet systems for 1981 include: SS-20, SS-4, SS-5, BACKFIRE, BADGER, and BLINDER. NATO figures include F-111 and VULCAN.

-- In medium-range nuclear-capable delivery systems (Figure 9, annex), the Warsaw Pact has about a 3:1 advantage. When warhead loadings for these systems plus missile refires are compared, the advantage is 5:1. When systems estimated to have a known nuclear role are compared (Figure 10, annex) (again counting warhead loadings and missile refires), the ratio is almost 4:1 in favor of the Warsaw Pact. (The lower number of systems is owing primarily to exclusion of dual-capable aircraft, which are estimated as not being assigned a nuclear role.) Soviet systems include SS-12/22, SS-1, FENCER, FLOGGER, FITTER, and BREWER. NATO systems include PERSHING 1A, JAGUAR, F-16, F-104, BUCCANEER, and F-4.

-- As shown in Figure 11 in the annex, when all nuclear-capable short-range delivery systems are included, NATO enjoys more than a 3:1 numerical advantage because of the large number of dual-capable artillery pieces in NATO's inventory. A comparison of delivery systems which probably have a nuclear role, however, reduces the margin to less than 1.5:1. Soviet systems include SS-21, FROG, 203mm howitzer, and 240mm mortar. NATO systems include LANCE, HONEST JOHN, 203mm and 155mm howitzers.

WARSAW PACT CONVENTIONAL THREAT

28. Over the last 15 years, the Warsaw Pact has undergone significant changes in both quantity and quality of conventional military forces. The result of this program has been the development of a very large, highly mobile, combined-arms force, which is offensively oriented and capable of sustained operations. The probable strategic goal of this force is to isolate and defeat NATO forces in place before NATO can mobilize and bring its considerable economic potential to bear.

29. There has been a steady program of research, development, and introduction of modern weapons systems and supporting equipment into all Pact forces. As illustrated in Figure 12 in the annex, since 1965, the increases in equipment range from a low of 30 percent for the number of tanks

to more than 100 percent for armored fighting vehicles. Growth in force size has been accompanied by qualitative improvements throughout the force structure. The Soviets are re-equipping their ground forces with weapons systems and vehicles designed to increase mobility, firepower, and survivability. The most modern Warsaw Pact tanks, the T-64 and T-72, now comprise about 25 percent of the tank force opposite NATO. In addition, the Soviets have introduced new self-propelled artillery, the BTR-70 armored fighting vehicle, and upgraded surface-to-air missiles (SAM) and anti-tank guided missiles.

30. While the quantitative increase in total Warsaw Pact air forces has not been as consistent or dramatic as in the ground forces, the qualitative changes have been most impressive. These systems include:

- New precision-guided air munitions.
- Improved on-board navigation systems for tactical aircraft, which should reduce reliance on ground-based control.
- Improved low-altitude intercept capabilities.
- Greater combat radius and pay load.

31. From the standpoint of force-generation capabilities, the Pact has a numerical advantage in terms of standing forces, but many divisions are manned at reduced and cadre strength in peacetime. Substantial mobilization, preparation, and movement would be required before this entire force could be committed. Many forward area divisions, however, are maintained at high levels of peacetime preparedness and could be committed prior to the availability of forces garrisoned in the western regions of the USSR. The Warsaw Pact has deployed about 165 divisions, both Soviet and non-Soviet, throughout Eastern Europe and the western regions of the USSR for operations against NATO as a whole. These forces are maintained at various levels of readiness, with the most ready divisions generally located near the borders of NATO countries. Subsequent mobilization would be accomplished from the Soviets' reserve manpower pool. This includes more than five million men who have received training in the ground and paramilitary forces within the last five years.

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32. In the near future, Warsaw Pact force levels are expected to remain fairly constant; but research, development, testing, and fielding of new sophisticated weapons systems will continue. For example:

-- The Soviets are expected to begin testing of a new medium tank this year. It probably will not differ greatly from the T-64/T-72 series but is likely to be followed during the late 1980's by a significantly improved medium tank to counter the M-1 and LEOPARD 2.

-- Ground force air defense capabilities will also be enhanced during the period by introduction of two new SAM systems: one at the army/front level and one at the division level. These systems will give the Soviets improved mobile air defense protection at all altitudes.

-- Modernization of the air forces is expected to continue. By 1985, three new aircraft will be introduced. These include the SU-25 now entering service, which will provide the Soviets with improved ground attack capabilities, and two new fighters designed for air-to-air missions. In addition, an improved airborne warning and control system (AWACS) aircraft based on the CANDID is expected to be introduced.

33. Thus, the across-the-board modernization effort that has been an ongoing effort in the realm of conventional forces for over the past decade will continue for the foreseeable future, presenting a formidable threat to NATO's TNF and conventional forces.

STRATEGIC FORCES THREAT

34. The vitality seen in Soviet programs to improve their conventional and TNF is also clearly evident in Soviet programs to improve their intercontinental attack forces. The Soviet intercontinental strike force is composed primarily of silo-based intercontinental ballistic missiles (ICBM's) and a lesser number of submarine-launched ballistic missiles (SLBM's) carried by nuclear submarines. As shown in Figure 13 in the annex, the steady growth in the number of intercontinental delivery vehicles has been accompanied by a dramatic increase in the number of weapons that Soviet delivery vehicles carry, from a few hundred in 1965 to about 6700 today. The area of soft targets that these weapons

could destroy has increased fourfold. The Soviets' capability to attack hard targets, which is determined by the warheads on their newer ICBM's, has increased sharply since the late 1960's.

35. As shown in Figure 14 in the annex, ICBM improvements were due primarily to modernization of the land-based ICBM force, which continued throughout the 1970's as the Soviets equipped more than 750 launchers with the latest generation of ICBM's--the SS-17, SS-18, and SS-19. This improved the force in several ways. The newer missiles carry multiple independently targetable reentry vehicles (MIRV's), so that the force can attack more targets even though it has fewer launchers than it had in 1972. The silos for the SS-17, SS-18, and SS-19 are considerably more resistant to attack than those for the SS-9 and SS-11 they replaced. They are also harder than US missile silos. Finally, the latest versions of the SS-18 and SS-19 are more accurate than the most advanced currently deployed US ICBM.

36. SSBN's. The Soviets have also increased the size of their strategic force at sea. Beginning in 1968, the SLBM force was expanded and modernized, with deployment of the Y-class nuclear-powered ballistic missile submarines (SSBN's) which carry 16 SS-N-6 missiles. The range of the missiles permitted these missile-carrying submarines for the first time to cover targets in the United States from the open ocean. The Y-class program was followed in 1973 by introduction of the D-class, which carries 12 or 16 launchers for long-range SS-N-8 or SS-N-18 missiles. These missiles, which now make up nearly half of the launchers in the SLBM force, enable the launching submarine to attack targets in the United States while operating in or near Soviet-controlled waters. The SS-N-18, introduced in 1978, is the first Soviet SLBM with MIRV's. In September 1980, the Soviets launched the first SSBN of a new class--the TYPHOON, the largest submarine in the world. It will carry a new SLBM, which is currently under flight test. (Figure 15 in the annex shows the characteristics of the principal Soviet SSBN's and SLBM's.)

37. Bombers. In contrast to the strategic missile forces, the Soviet intercontinental bomber force has declined slightly in size since the mid-1960's. It now consists of about 145 BEAR and BISON aircraft--both types introduced in the mid-1950's. Bomber variants of BEAR and BISON are capable of carrying up to eight and six bombs respectively;

but in intercontinental missions, we would expect each to carry no more than four weapons.

38. Future Systems. With respect to future systems, the Soviets are now in position to improve their strategic forces even further. There are new or modified strategic offensive systems in early stages of development. These systems are expected to show improvements in one or more areas, including accuracy, reliability, and responsiveness; many will be MIRVed.

39. One of the Soviets' principal goals in modernizing their intercontinental attack force has been to improve the accuracy of their ICBM's and thus their potential for destroying US ICBM launchers. Calculations of the theoretical capability of the Soviet ICBM force, using two weapons against each silo, shows that the bulk of US ICBM launchers would have been destroyed in a Soviet first strike in 1980. The accuracy of the MIRVed Soviet ICBM force will further increase the risk to the US silo-based ICBM force in the 1980's when the Soviets will achieve even greater damage expectancies against US silos using only one weapon against each silo. However, US SLBM's aboard ballistic missile submarines at sea, alert strategic bombers, and surviving ICBM's will be able to retaliate in the aftermath of a Soviet first strike. Moreover, the United States is currently taking steps to reduce the vulnerability of its land-based ICBM force.

40. Strategic Defense Forces. The Soviets have complemented their forces for strategic attack with a strong defensive effort designed to reduce damage from an enemy strategic attack. They have developed systems that can detect and destroy some incoming SLBM's and older US ICBM's as well as satellites in orbit. The Soviets have also continued to emphasize measures, familiar from World War II, for shooting down enemy bombers and protecting civilians.

a. The Soviets have deployed around Moscow a limited anti-ballistic missile (ABM) defense, which they are now in the process of improving. The system's current capabilities to counter a large-scale missile attack are poor, but the Soviets are continuing research and development on new ABM systems.

b. The Soviets strategic air defense forces (PVO STRANY), which have remained fairly stable since the

mid-1960's, consist of SAM's and interceptor aircraft designed for use against enemy bombers. In the mid-to-late 1970's, the number of launchers decreased slightly as older sites were deactivated, and the force now stands at nearly 9500. Recently, the Soviets began fielding the SA-10, an all-altitude system, which is a significant improvement over the earlier SAM systems in terms of target handling, fire-power, and transportability, in addition to having potentially better capabilities at low altitudes. The number of strategic interceptor aircraft declined from the mid-1960's until the early 1970's as the defensive missile force expanded. In recent years, their capabilities have improved, however, as older aircraft have been replaced with missile-equipped, all-weather aircraft. Present Soviet air defenses have good capabilities to defend against bombers at medium and high altitudes. They have major deficiencies in their ability to detect, track, and engage targets, such as cruise missiles, at low altitudes. New systems now being deployed and others being tested offer the potential for substantial improvement.

c. The Soviets have also developed means of interfering with or even destroying US satellite systems. They have a non-nuclear interceptor satellite that can engage other satellites in near-earth orbit. The missiles of the Moscow ABM system could also be used for direct nuclear attacks on satellites.

d. Soviet civil defense is a nationwide program under military control. The goals of this program are to protect the leadership, the work force at key economic facilities, and the general population, in that order; to maintain the continuity of economic activity in wartime; and to enhance the country's capability for recovery from the effects of war. The effort to protect people has two major elements--shelter construction and evacuation. The effectiveness of these measures in reducing casualties would depend on the time available for final preparations.

41. By virtue of the steady growth in their strategic programs, the Soviets have achieved nuclear capabilities that are widely perceived to be at least equal to those of the United States. They are continuing vigorous programs to improve all aspects of their forces and are in good position to undertake further strategic force improvements in the 1980's. Trends in most of the measures of strategic power will favor the USSR in the early and mid-1980's.

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Thereafter, trends favoring the Soviets could be eroded by US force improvements.

III. CONCLUSIONS

42. The meaning of the trends in Soviet capabilities is clear. Soviet capabilities across the board have been improving and will continue to improve. For a number of years we have been aware of the growing imbalance between NATO and the Warsaw Pact in LRTNF. Since 1975, the Soviets have increased dramatically the number of LRTNF warheads targeted on Western Europe to a total which is far more than present or planned NATO deployments and clearly in excess of any conceivable defensive purpose. The growing SS-20 force, with 252 launchers currently deployed and nine new bases under construction, represents the major long-range threat to NATO.

43. At all ranges, Soviet TNF capabilities are expanding while NATO's TNF stockpile has been reduced (e.g., the 1000 warhead withdrawal). Follow-on systems to the FROG and SCUD short-range nuclear missiles are either being deployed or nearing deployment, and the more accurate SS-22 replacement for the medium-range SCALEBOARD is also being deployed. Aircraft modernization, including on-going FENCER, FLOGGER, and FITTER deployments, is moving forward. This dynamic modernization program gives the Soviets multiple, redundant, and highly flexible theater nuclear options for targeting and destroying NATO's currently deployed TNF (and a wide range of other targets). It also enables the Soviets more effectively to carry on extended nuclear operations integrated with conventional operations. Thus, escalation to nuclear conflict and control of escalation at levels of Soviet choosing in Europe may appear to be an ever more viable option for the Soviets, at the same time rendering NATO's counter-threat to escalate less credible. Soviet weapons deployment programs, which produce a situation in which NATO's nuclear deterrent is rendered less credible while the advantages to the Warsaw Pact of a resort to theater nuclear conflict are enhanced, lower the nuclear threshold, and can only be viewed as destabilizing.

44. Trends in the balance of conventional forces are no less troubling. As in the nuclear buildup, the conventional Soviet buildup far exceeds any reasonable requirement for defensive purposes. The trends demonstrate a capability not

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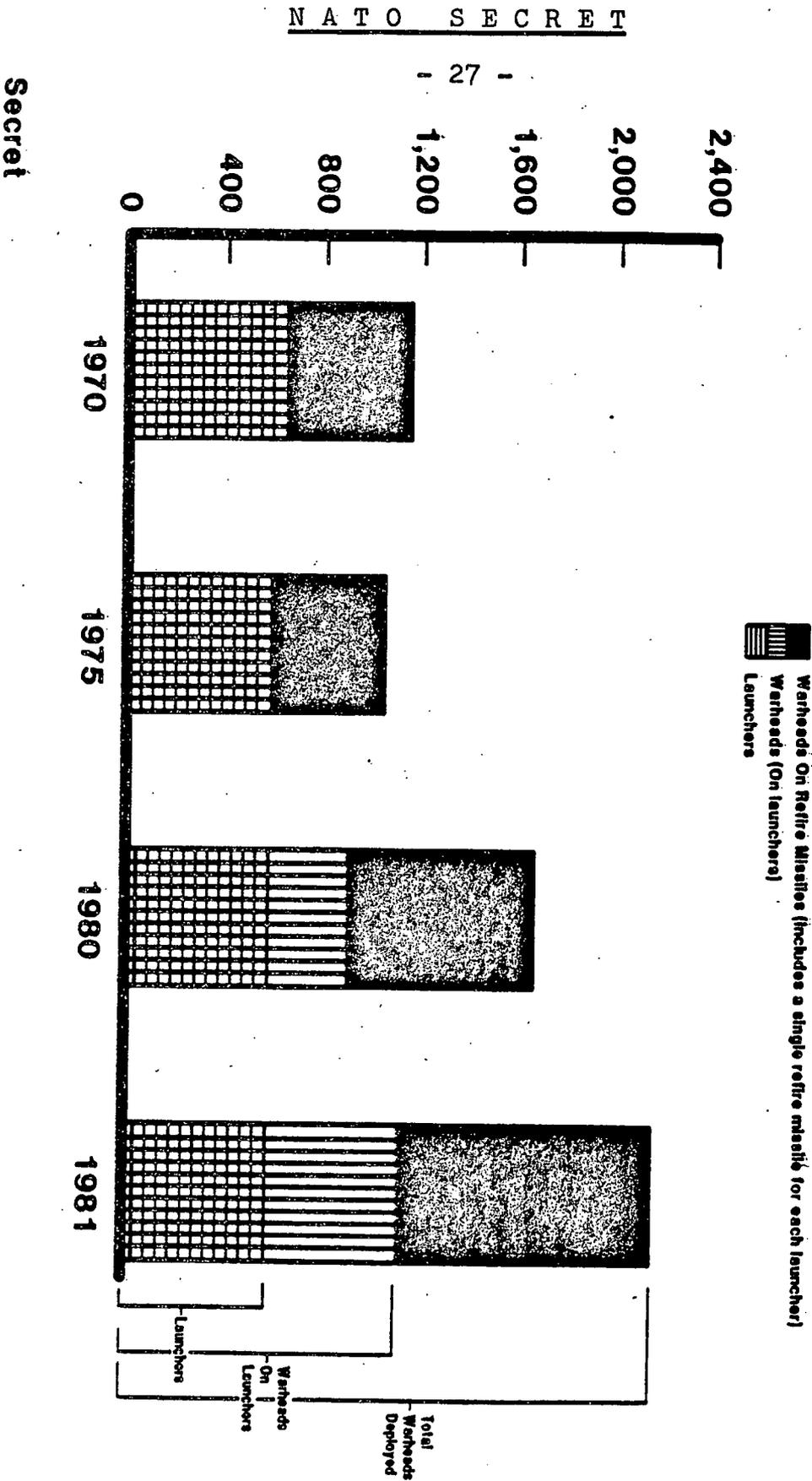
only to pose a serious challenge to NATO's conventional defense but to put a significant portion of NATO's TNF posture at risk from conventional attack. This could place the credibility of NATO's threat to escalate and NATO's ability to withstand conventional assaults increasingly in question. Thus, the Soviets could come to believe they might gain strategic or political objectives merely via possession of superior theater nuclear forces without having actually to use them.

45. The parallel growth of Soviet central strategic capabilities to the point where the Soviets are widely perceived to be at least equal and, in some capabilities superior, to the United States demonstrates that the growing threat to NATO's TNF posture is part of an overall Soviet effort to assert military superiority over the West. Such superiority, if it were attained, would permit the Soviets to exert political pressure in peacetime and in crises, confident in their ability to prevail against NATO should conflict occur. If NATO is to preserve a credible deterrent in the face of this fundamental challenge to its security, it will require a sustained and effective response adequate to the challenge in line with Alliance strategy.

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Figure 1

Soviet Long Range TNF Land Based Missiles - Worldwide



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Soviet and NATO Long Range TNF Land Based Missiles Qualitative Trends

Figure 2

Soviet

NATO

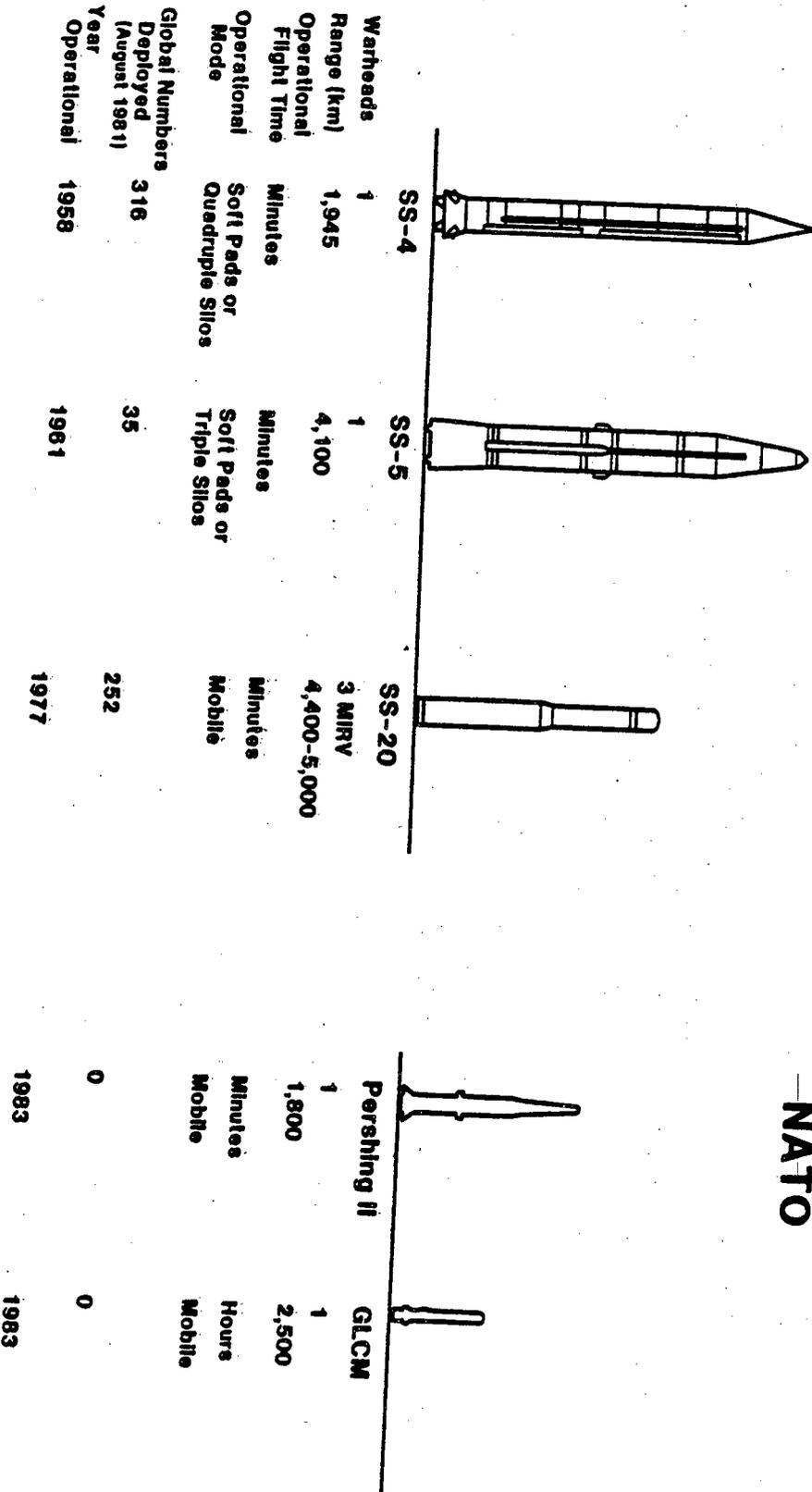


Figure 3
The SS-20: Coverage of European Targets From Bases East of the Urals

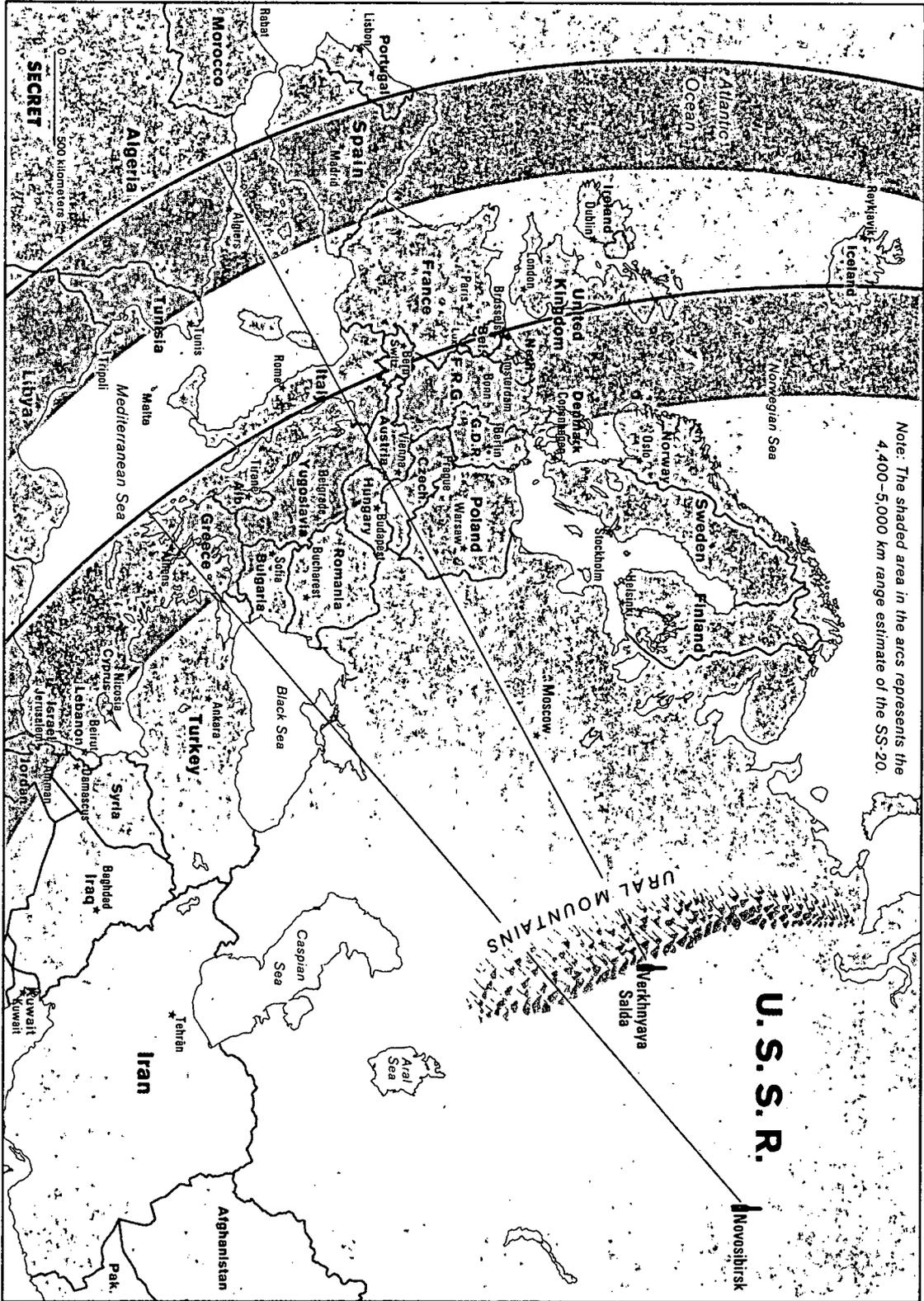
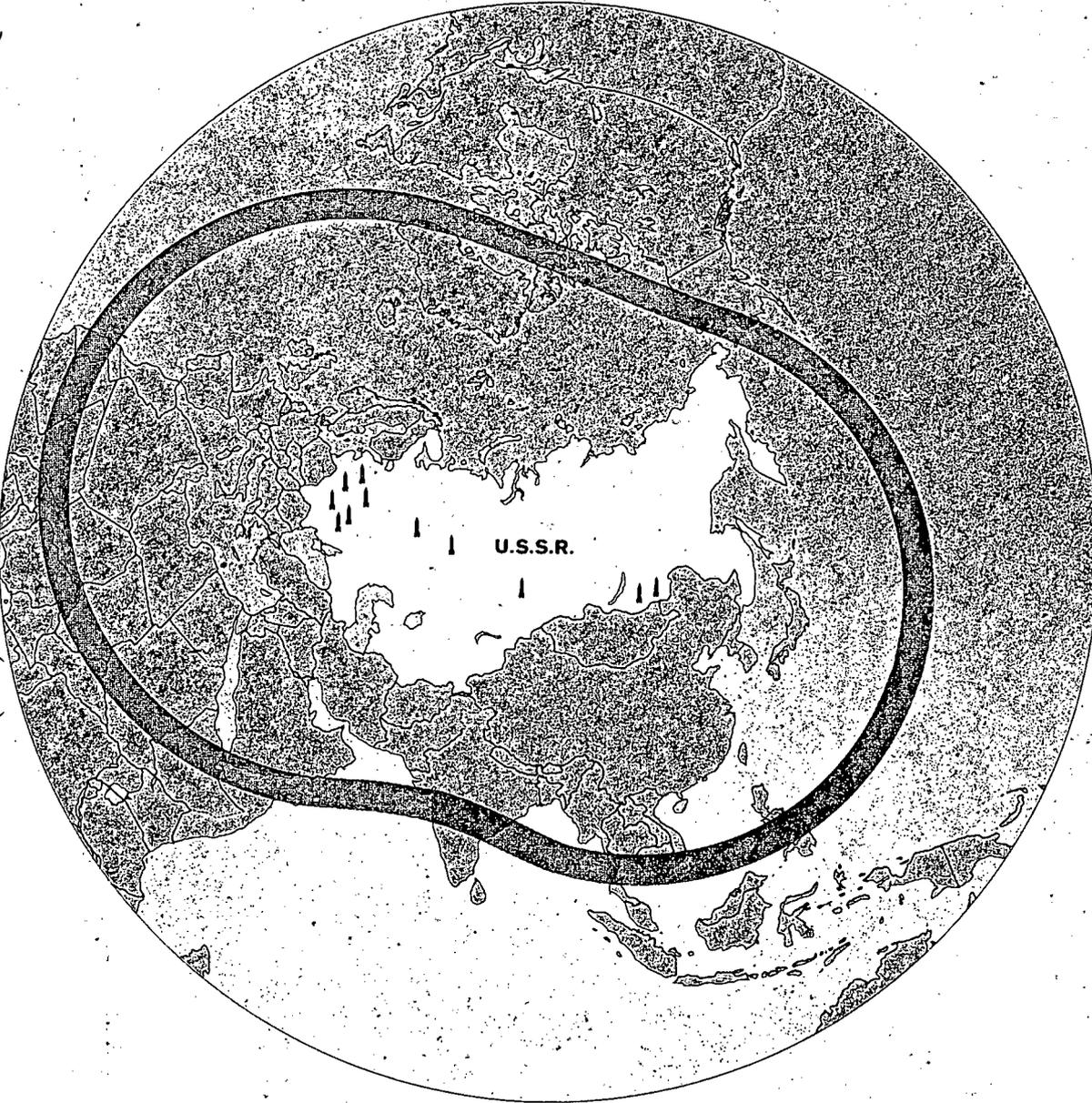


Figure 4
The SS-20: Deployment and Target Coverage

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Soviet SS-20 Deployment

End Year	1977	1978	1979	1980	mid-1981*
Missiles	9	72	144	198	252
Warheads	27	216	432	594	756

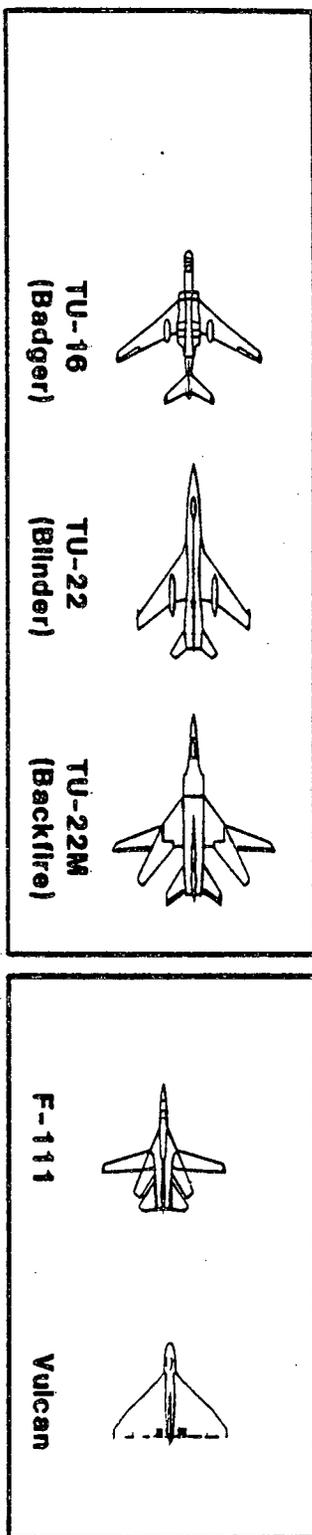
*This does not include retire missiles.

Note: The shaded band represents the 4,400-5,000 km range estimate of the SS-20.

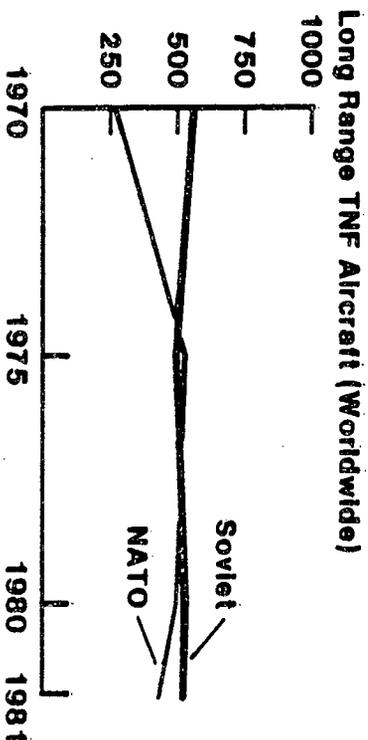
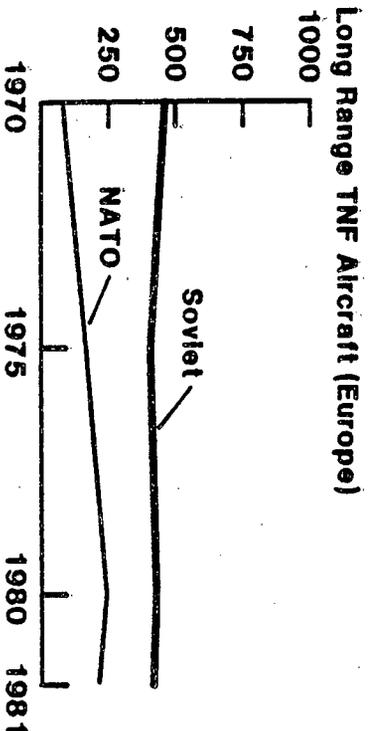
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Figure 5
Soviet and NATO Long Range TNF Aircraft
Qualitative and Quantitative Trends

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Year Operational	1954	1962	1974	1967	1955
Nominal Weapon Load	3 Bombs (or 2 ASMs)	3 Bombs (or 1 ASM)	4 Bombs (or 2 ASMs)	2 Bombs	1 Bomb
Combat Radius (km) With Bombs	2050	1850	2400 - 3350	2600	1800

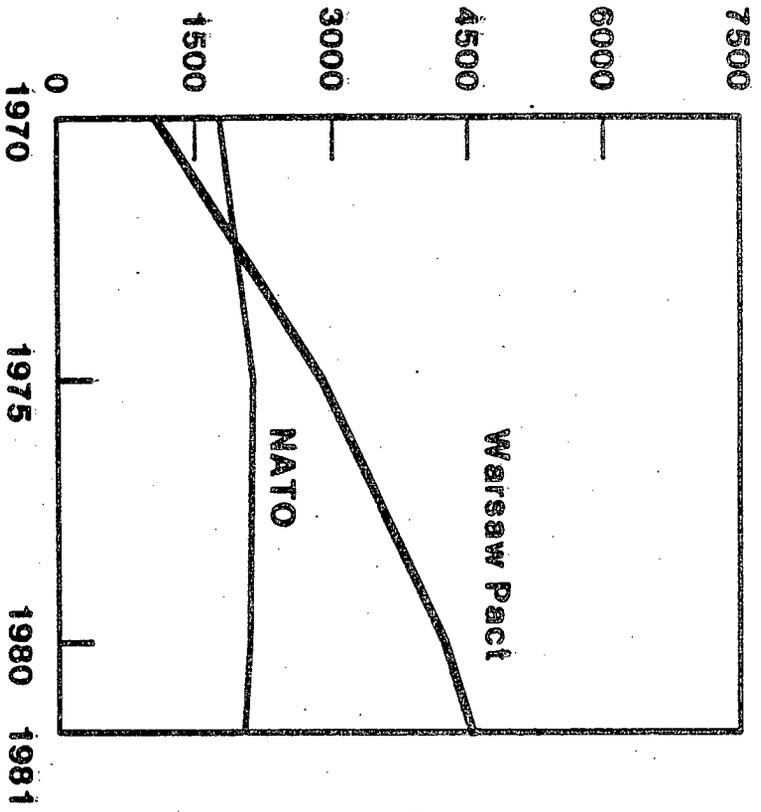


Note: Of the Long Range TNF aircraft shown, only the Backfire is currently in production with about 30 being produced annually.

Figure 6

Medium Range TNF Aircraft Nuclear Capable

Europe



Worldwide

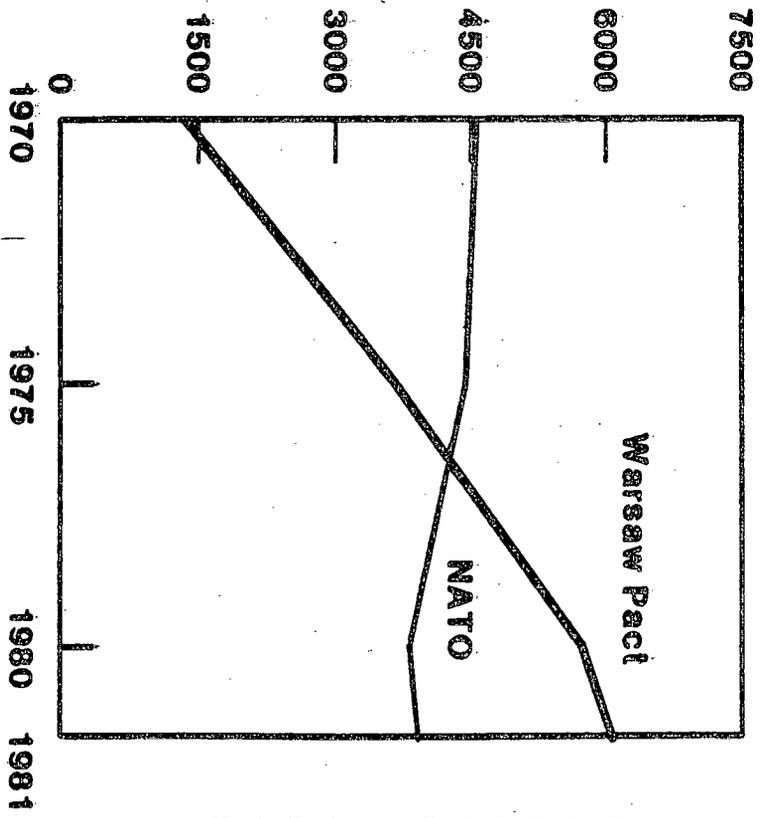
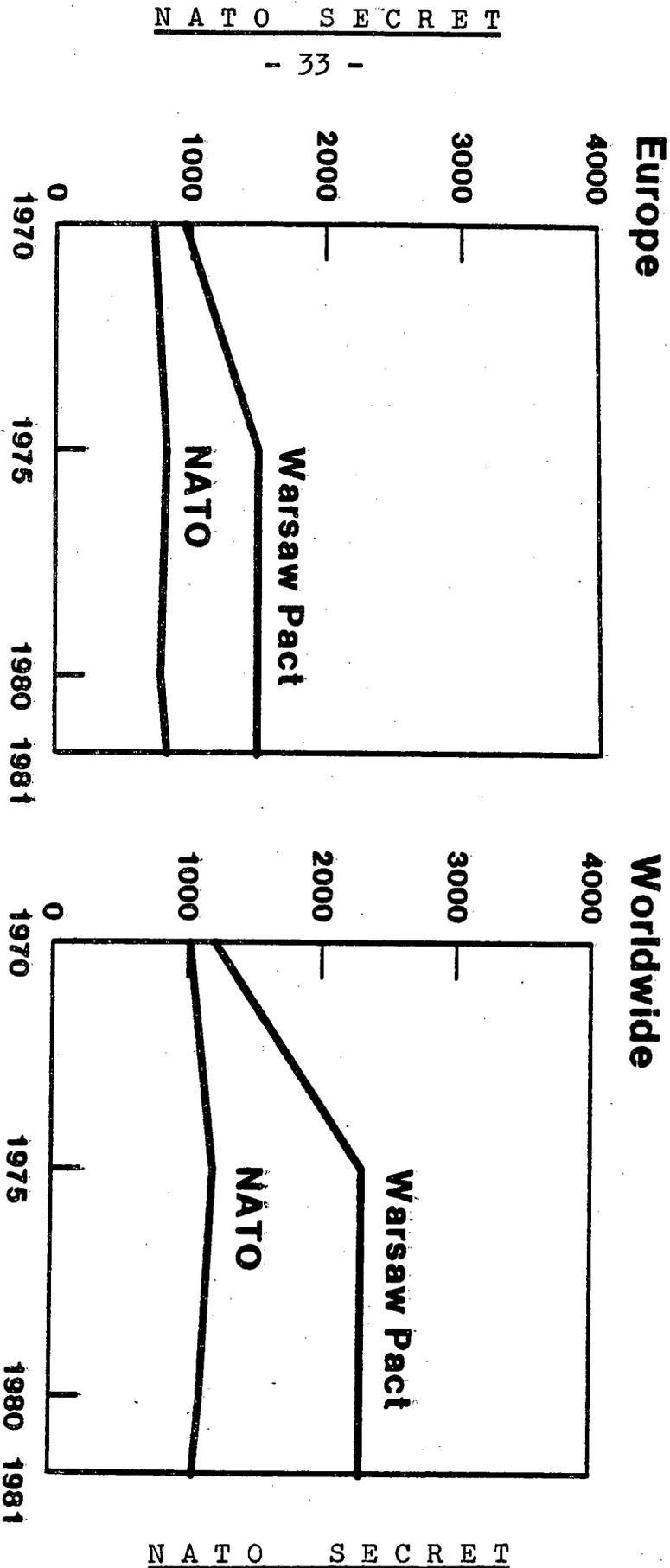


Figure 7

Medium Range TNF Aircraft Nuclear Role



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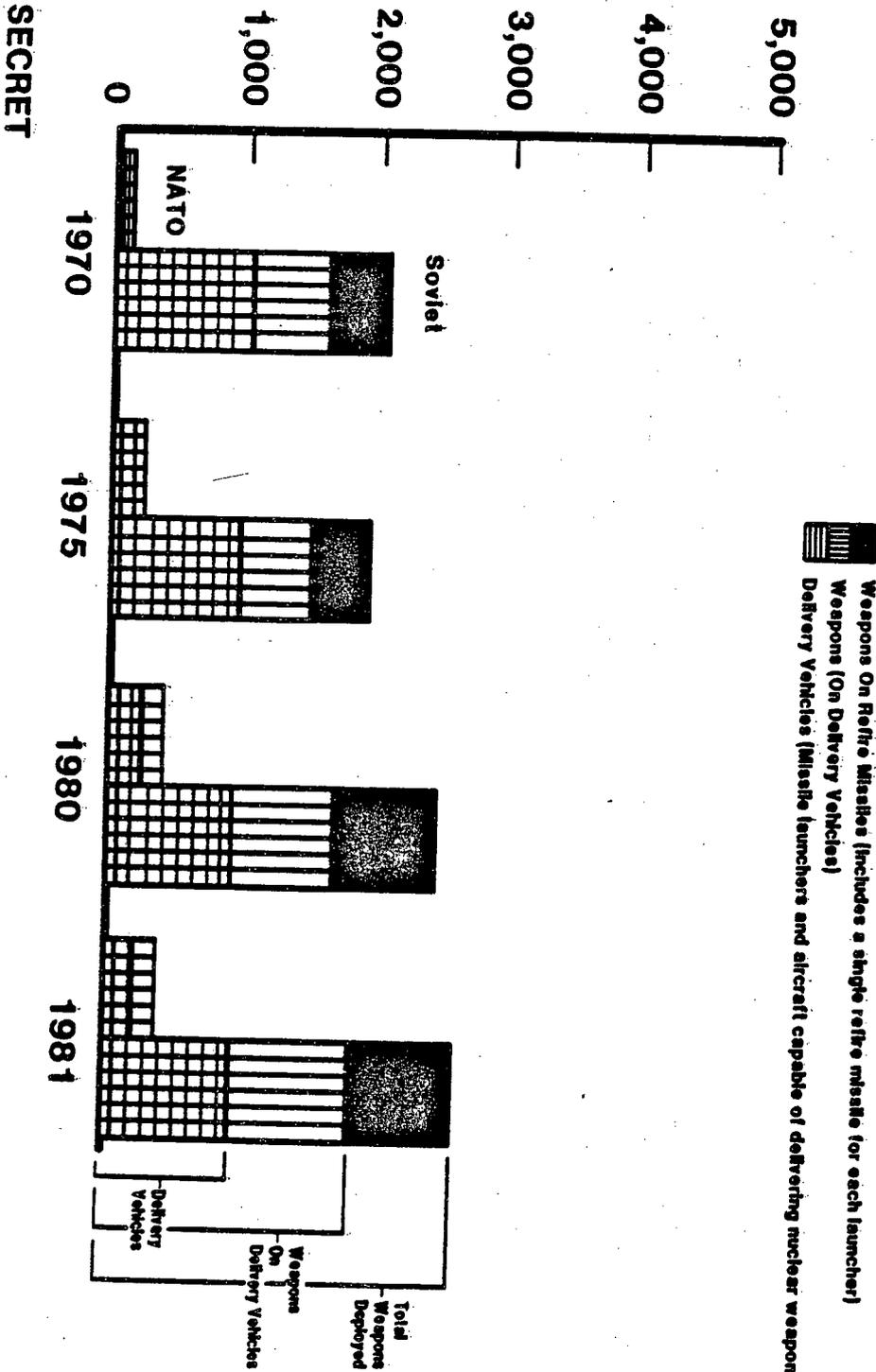
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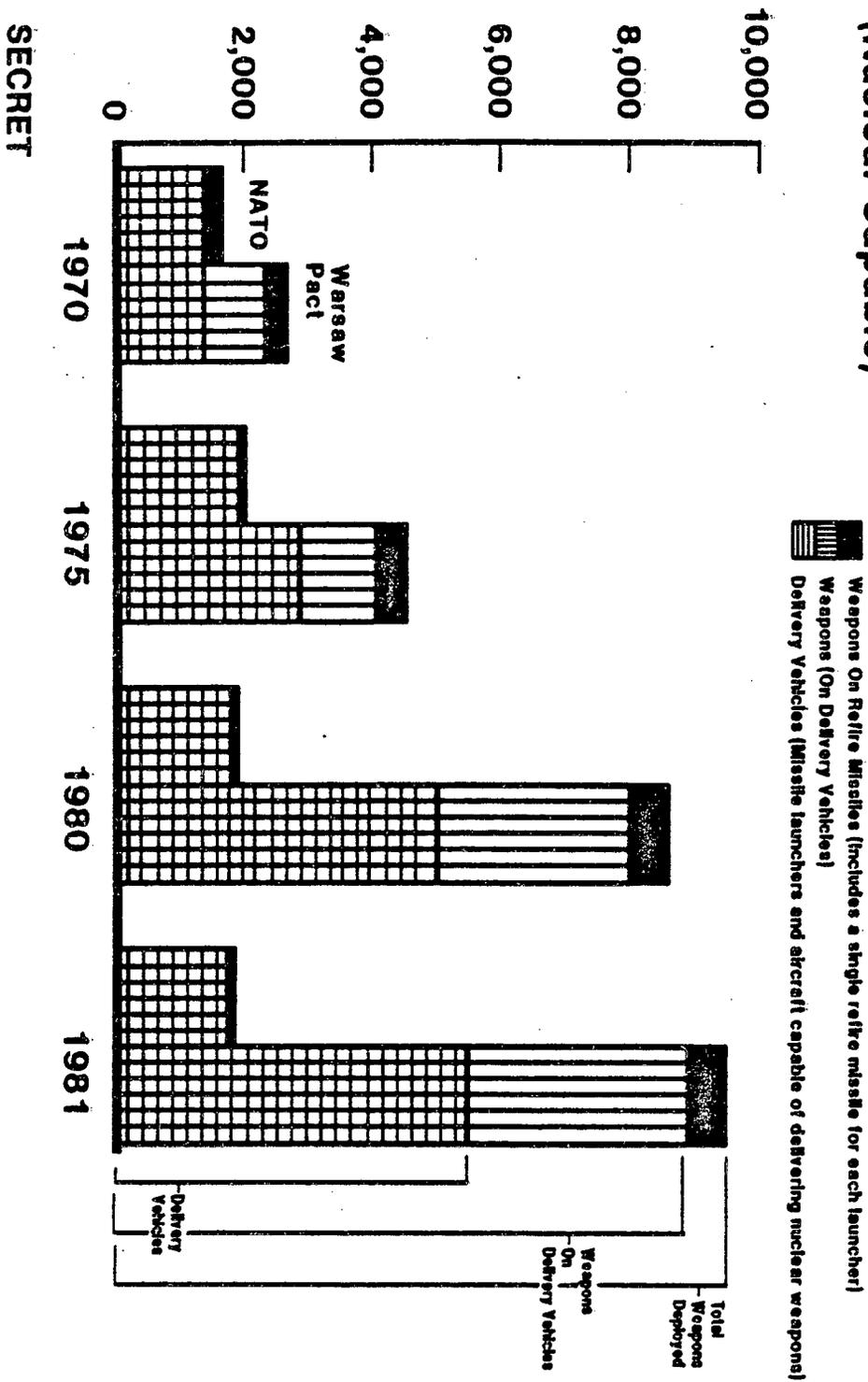
Figure 8
The Soviet-NATO
Long Range TNF Balance - Europe



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Figure 9

The Warsaw Pact-NATO Medium Range TNF Balance - Europe (Nuclear Capable)



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Figure 10

The Warsaw Pact-NATO Medium Range TNF Balance-Europe (Nuclear Role)

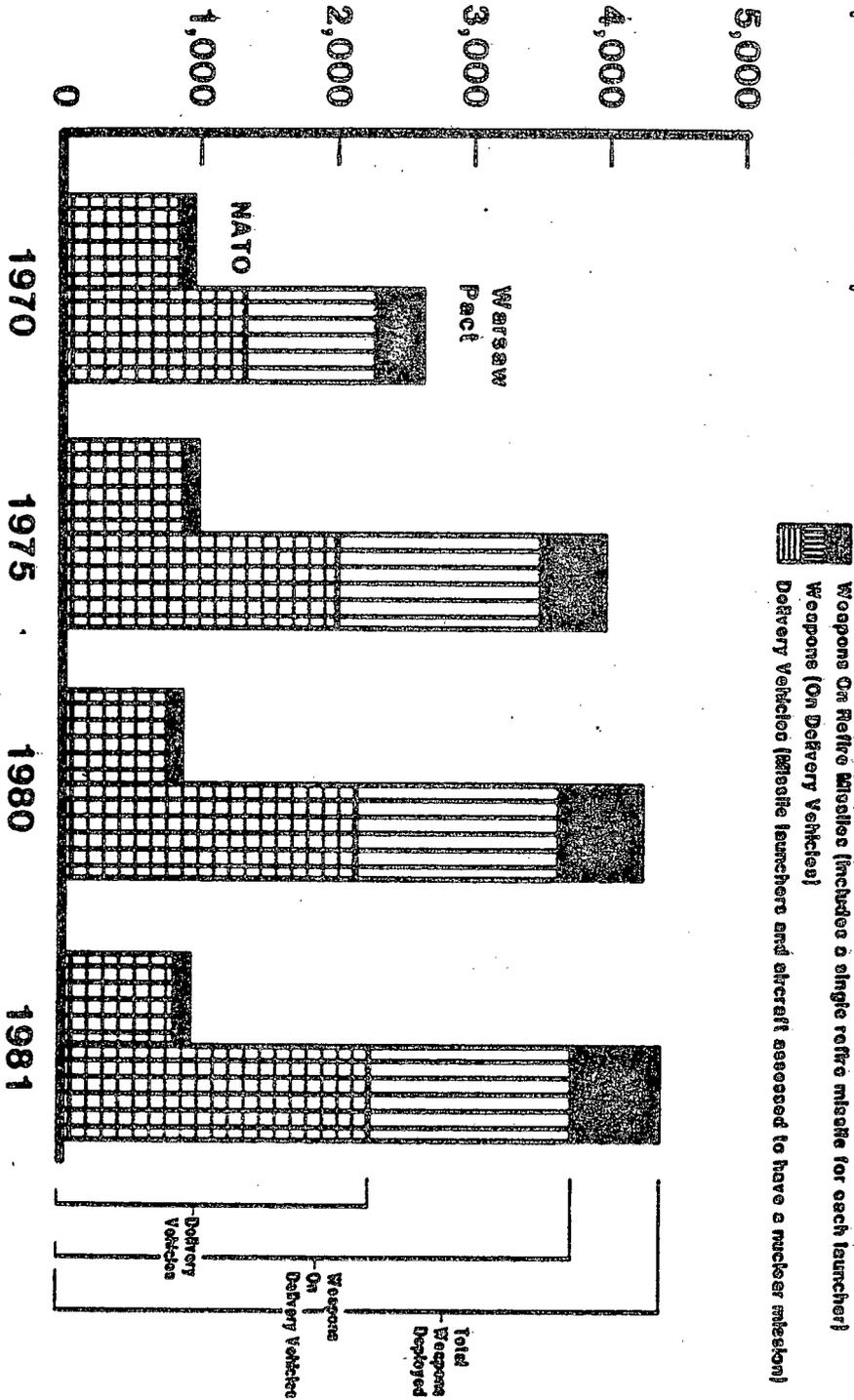
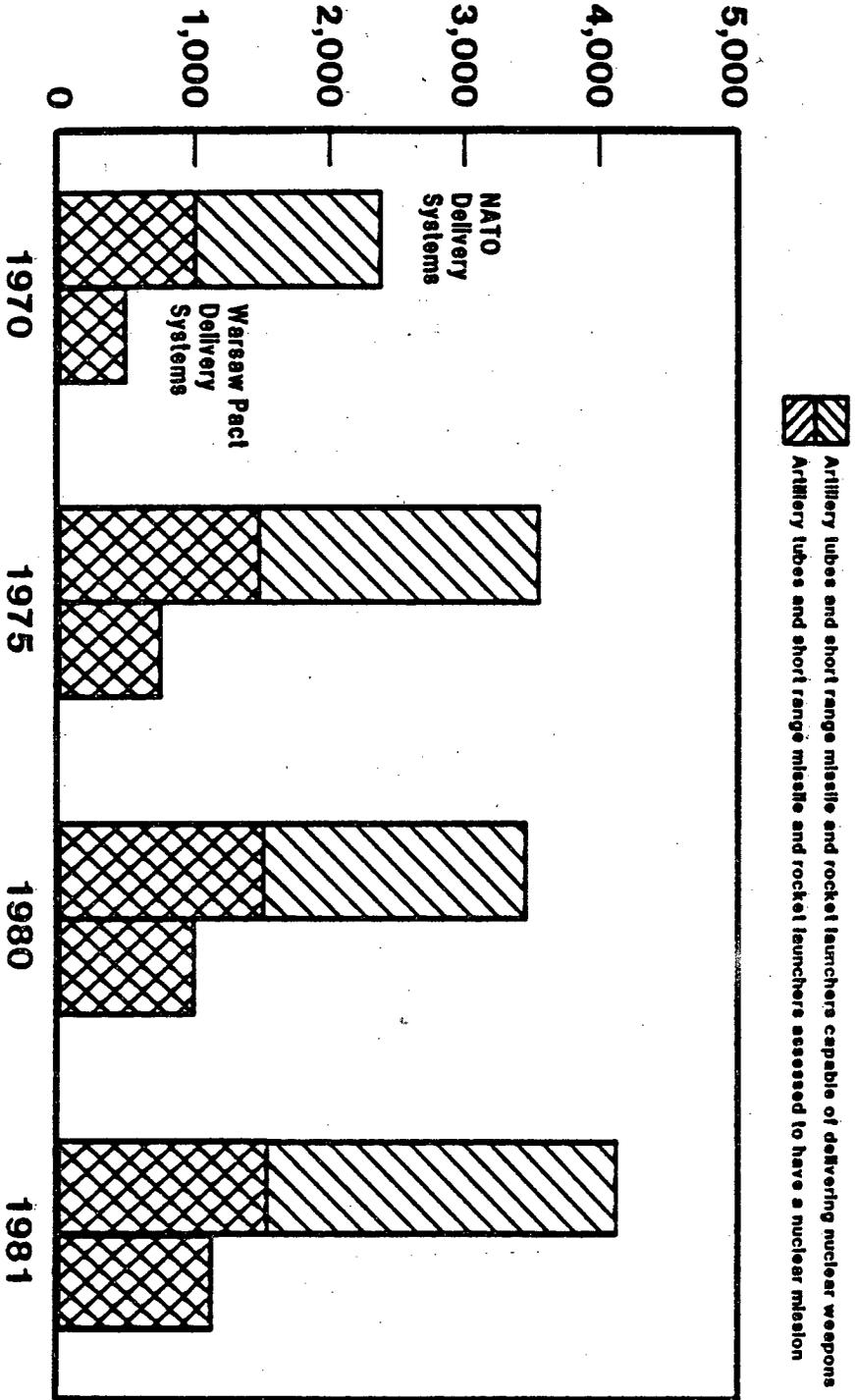


Figure 11

The Warsaw Pact - NATO Short Range TNF Balance - Europe



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Note: Bars do not include rifle missiles, rockets or additional nuclear artillery rounds that may be available.

Warsaw Pact Ground Force Modernization Since 1965 - Opposite Europe

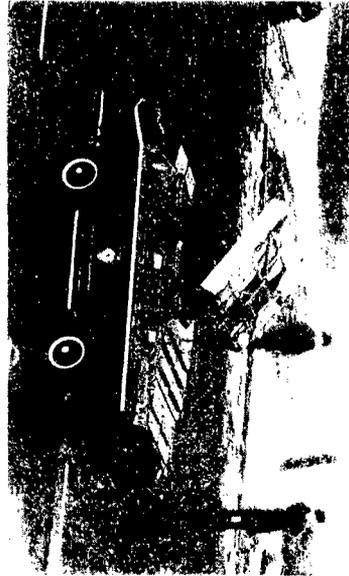
Figure 12

Armored Fighting Vehicles - Up 108%



1965 - 30,500
Today - 63,600

AAA/SAMs - Up 104%



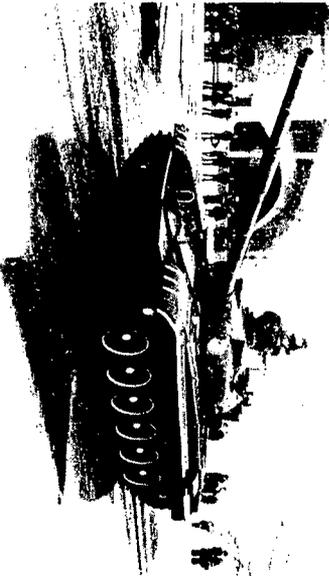
1965 - 6,400
Today - 13,000

Artillery/Multiple Rocket Launchers - Up 82%



1965 - 11,400
Today - 20,700

Tanks - Up 30%

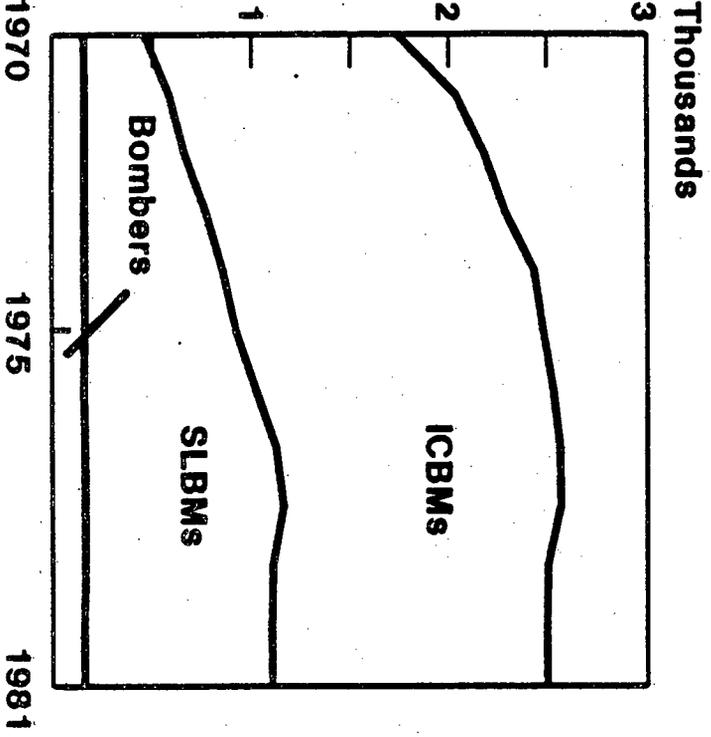


1965 - 32,300
Today - 42,000

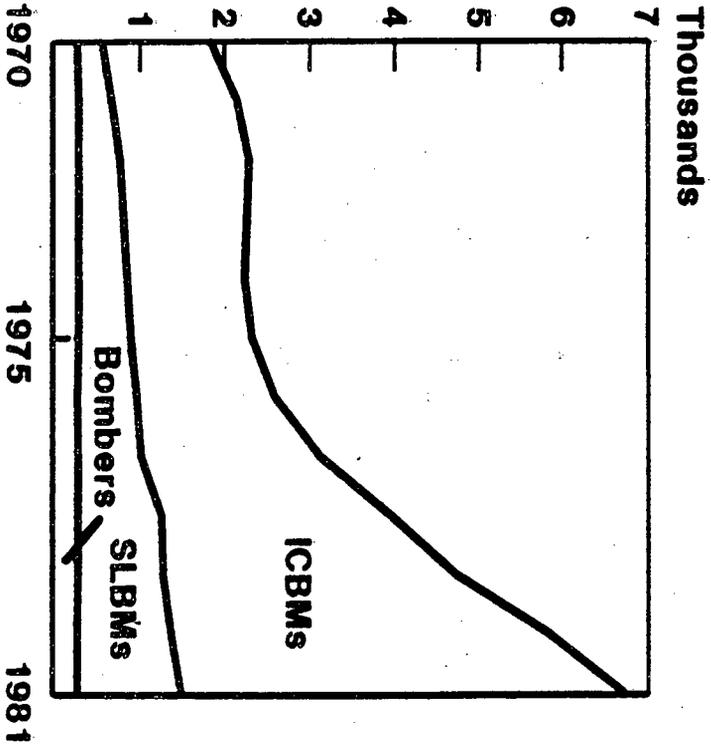
Figure 13

Growth and Composition of Soviet Strategic Forces 1970-81

Number of Delivery Vehicles



On-Line Missile RVs and Bomber Weapons



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Figure 14
Soviet and US ICBMs

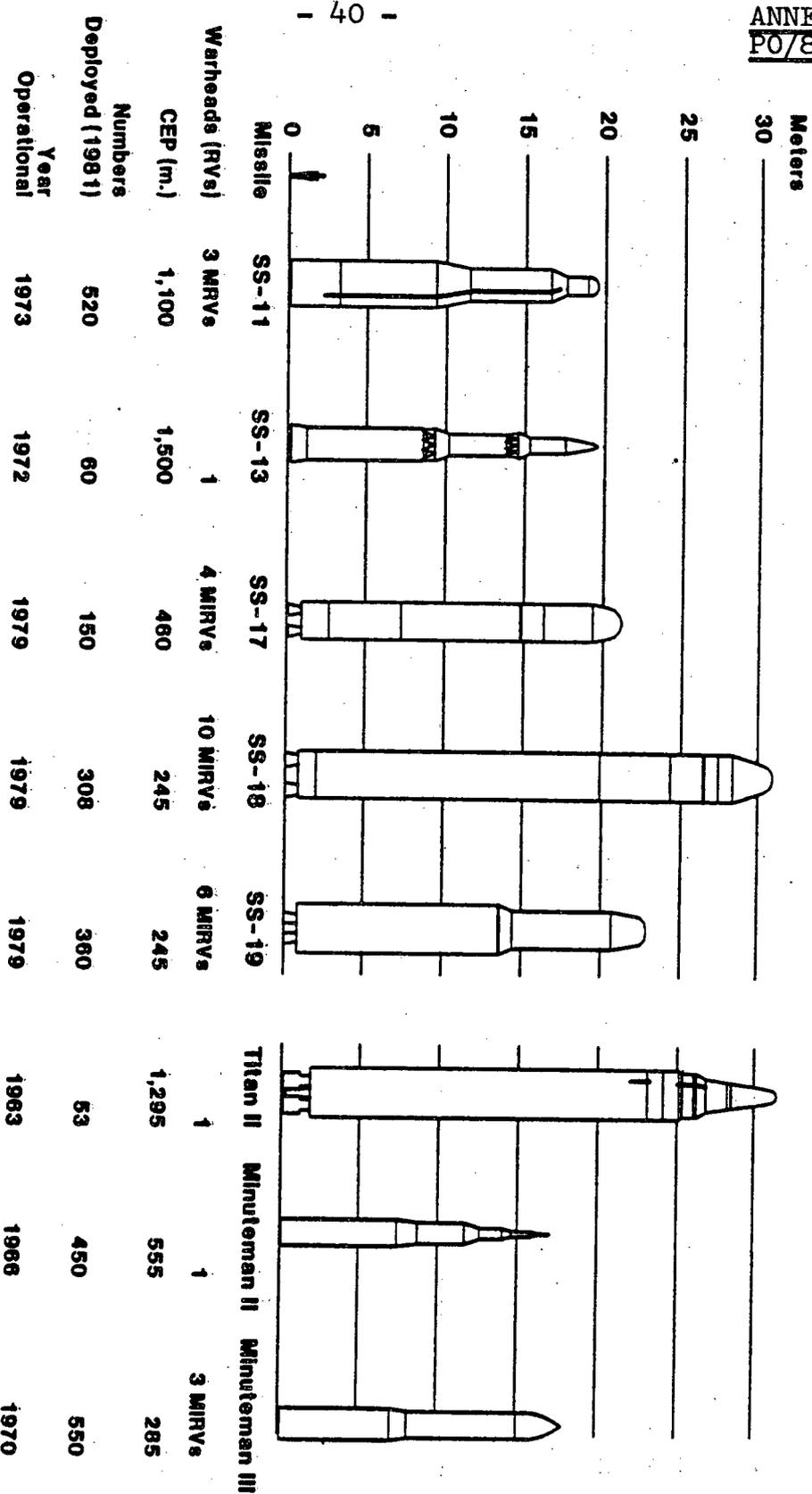
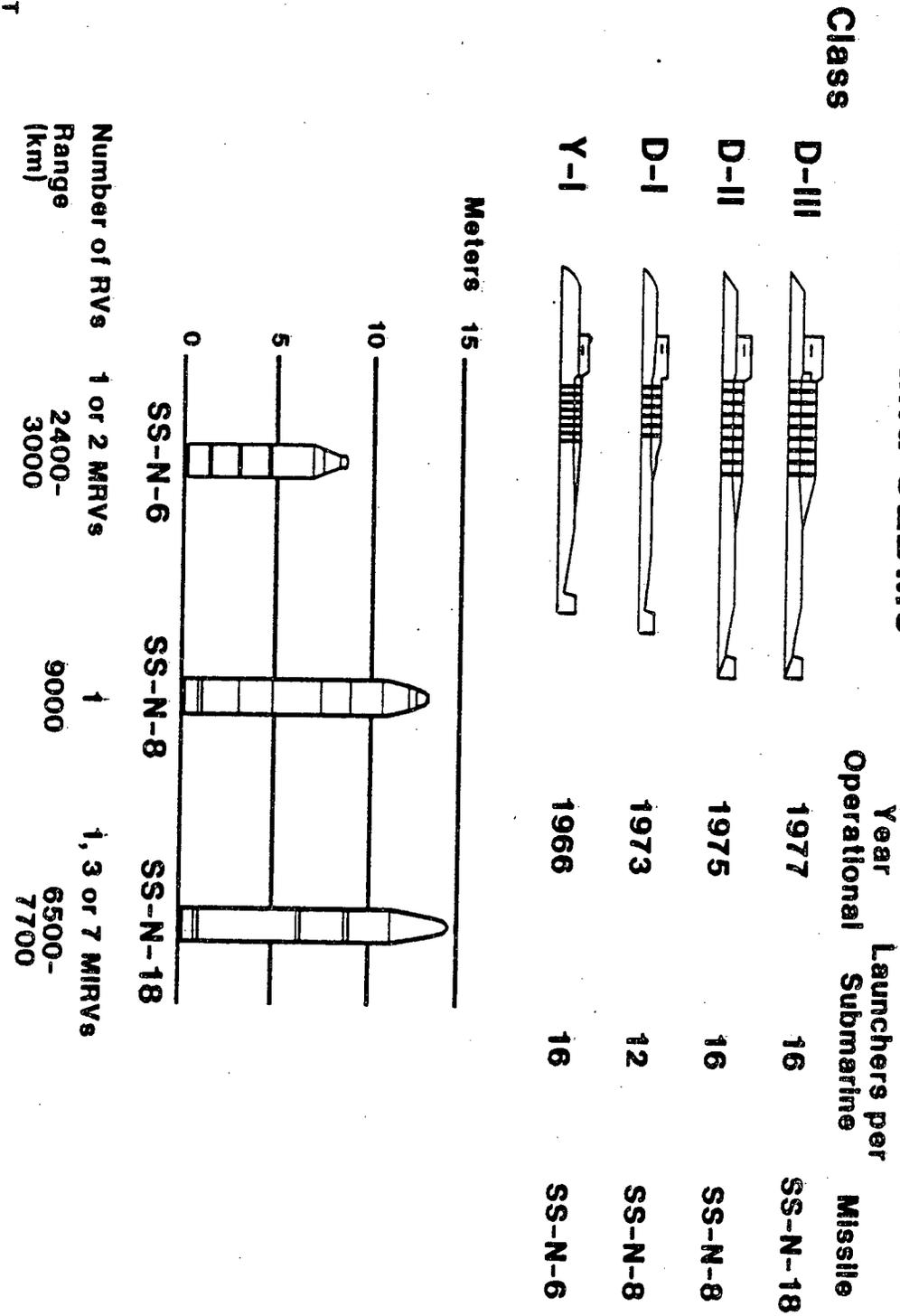


Figure 15

Estimated Characteristics of the Principal Soviet SSBNs and SLBMs*



* Does not include the Typhoon SSBN now undergoing sea-trials or its missile system.

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NUCLEAR PLANNING GROUP

HIGH LEVEL GROUP

NATO'S THEATER NUCLEAR FORCES

FUNCTIONAL REQUIREMENTS

September 1981

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EXECUTIVE SUMMARY

1. Scope and Purpose: This paper responds to the request by NATO Foreign and Defense Ministers at the May 1981 meetings for a study of the Alliance's functional requirements for theater nuclear forces (TNF). The purpose of the study is threefold: (1) to identify NATO's TNF functional requirements--those requirements which must be met to fulfill the functions assigned to theater nuclear forces in Alliance strategy; (2) to assess the capability of NATO's current and planned TNF to meet these requirements; and (3) given this assessment of capabilities, to refine and expand upon the framework established by the Alliance on December 12, 1979, in the Integrated Decision Document, which provides the commonly agreed basis for long-range TNF modernization and arms control. It is not the purpose of this study to generate specific force requirements; but rather we have sought to identify requirements in a generic sense.

2. Summary of TNF Functions: The fundamental objective of NATO strategy is to ensure security through the deterrence of aggression against the Alliance. If military aggression occurs, NATO's objective is to restore the territorial integrity of the Alliance, to restore deterrence, and to terminate the conflict as early as possible.

3. Within the framework of the Alliance's flexible response strategy, TNF fulfill the following principal functions:

a. TNF help to deter a conventional attack on the Alliance by putting NATO in a position to initiate the use of theater nuclear weapons on a scale and in a manner of its own choosing. In this context, the potential use of NATO TNF against the Warsaw Pact should lead Pact commanders to disperse their armor and other concentrated forces, thus diminishing the Pact's capability to wage conventional war.

b. NATO TNF deter the use of TNF by the Warsaw Pact.

c. TNF provide the critical link between the conventional and strategic nuclear forces of the Alliance. This linkage, manifested by a perceived capability to execute nuclear options along a broad spectrum of conflict categories and intensities, is essential for credible deterrence.

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d. NATO TNF serve the political function of demonstrating the solidarity and cohesion of the Alliance through widespread participation, thereby strengthening deterrence.

4. Summary of TNF Requirements: To fulfill the assigned deterrent and defense functions, NATO's TNF posture must meet a number of political and military requirements.

a. Political requirements include:

-- Alliance solidarity in objectives to demonstrate a determined and unified commitment to preserving the security and integrity of the Alliance.

-- Widespread Alliance participation to underline the collective contribution of NATO members to achievement of Alliance security objectives.

-- A visible commitment by Alliance members to take the necessary steps to ensure an adequate and reliable defense posture.

-- Alliance maintenance of the perception of an overall balance providing adequate military capabilities relative to Soviet/Warsaw Pact forces for stable deterrence.

-- Alliance resolve to maintain adequate TNF in conjunction with conventional and strategic forces to deter the full range of potential aggression.

-- Safety and security features to prevent inadvertent, accidental, and unauthorized use in war and peace while maintaining accessibility in time of crisis.

b. Military requirements include:

-- A TNF structure capable of providing a full spectrum of credible military options which hold at risk a wide range of Soviet/Warsaw Pact targets. The Alliance's TNF posture, in conjunction with strategic forces, must meet the following general requirements:

. Adequate coverage at all ranges.

. Balance in deployments among geographic areas.

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. A mix that ensures flexible and survivable TNF adequately composed for effective employment.

-- NATO's TNF posture must also meet certain operational requirements. These are:

. Pre-launch survivability adequate to ensure that appropriate TNF responses are available in a timely and effective manner.

. The capacity sufficient to acquire time-urgent targets.

. Adequate and survivable command, control, and communications that assure close political control over the use of nuclear weapons.

. A high measure of systems reliability.

. A high probability of penetrating enemy defenses.

. The combination of yield and accuracy appropriate to achieve the necessary damage without disproportionate collateral effects.

5. Assessment of NATO Capabilities: The sustained qualitative and quantitative Soviet/Warsaw Pact military buildup as described in the Threat Assessment Paper has an adverse impact on NATO's ability to meet several TNF functional requirements:

a. Pre-launch survivability: The Soviet/Warsaw Pact military buildup of conventional and nuclear forces increases the vulnerability of much of NATO's forces, especially TNF.

-- The problem for short-range TNF is largely one of surviving in an environment of direct contact with hostile forces. At medium-range, NATO's TNF capabilities consist largely of dual-capable aircraft. Given that dual-capable aircraft operate from a relatively limited number of bases of known location, the survival of these high-value bases and the aircraft they support is in clear jeopardy. NATO's plans to modernize its long-range TNF with ground-launched cruise missiles and Pershing II missiles will improve survivability. Because these systems will disperse, and provided they

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are exercised and operated in a manner that recognizes the inevitably ambiguous nature of the warning likely to be available in times of tension or crisis, they will be highly survivable in the face of all but a bolt-out-of-the-blue nuclear attack.

-- The threat to the survivability of NATO's TNF and other forces is not confined to Soviet long-range TNF. The size, composition, and character of Soviet/Warsaw Pact medium-range TNF, when forward deployed, is such as to provide them with redundant target coverage of NATO Europe.

-- The overall expansion of the Soviet/Warsaw Pact TNF capabilities compounds the survivability problem associated with the supporting elements of NATO's TNF, as well as major elements of NATO's defense posture as a whole.

b. Target acquisition and communications, command, and control (C³) capabilities: NATO target surveillance, acquisition, and C³ capabilities are essential to a credible capability to execute the wide range of options called for in NATO strategy.

c. Ability to penetrate enemy defense: Because NATO presently relies heavily on medium- and long-range dual-capable aircraft, the expansion and upgrading of Soviet/Warsaw Pact air defenses has reduced the Alliance's overall ability effectively to carry out nuclear strikes. Although aircraft have unique and flexible capabilities that contribute to NATO's TNF posture, dual-capable aircraft should be complemented by adequate, survivable capabilities to ensure fully effective deterrence.

6. The updated data on the Soviet/Warsaw Pact threat serve to reinforce our prior concern that the Soviet/Warsaw Pact buildup in TNF could create an environment in which the Soviets could eventually come to believe that NATO lacked a credible response at certain levels of conflict and that they could therefore launch, or threaten to launch, a nuclear attack on Western Europe without risk of an adequate response.

7. Issues for Alliance consideration: To maintain fully effective deterrent and adequate defense capabilities, NATO should continue to improve its TNF structure to correct the deficiencies identified above. Accordingly:

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a. NATO TNF should be sufficiently survivable, flexible, and adequately composed to meet Alliance strategy in the light of the threat.

b. NATO's short-range TNF should have the necessary distribution, survivability, target coverage, responsiveness, and effectiveness.

c. NATO's medium-range TNF should be survivable and able to hold at risk critical targets threatening the Alliance.

d. NATO should proceed on schedule with the planned deployment of new LRTNF and negotiations on TNF arms control.

e. NATO should give continuing attention to improving capabilities for tactical warning, surveillance, target acquisition, command and control, and improved information processing to enhance the Alliance's TNF effectiveness and, hence, their credibility and deterrent effect.

8. The foregoing analysis of NATO's TNF requirements has led the High Level Group (HLG) to reflect on a number of crucial military implications of the forthcoming negotiations between the United States and the Soviet Union. The considerations set out below are aimed at deepening our understanding of the implications for NATO security of positions the United States may take into negotiations with the Soviet Union and of proposals that the Soviets make in those negotiations. We expect that continuing examination will be required of various possible force structures which could arise out of proposals tabled as the substance of the negotiations unfolds.

9. During HLG deliberations, it was often observed that reductions in the level of some TNF would increase the importance of those systems that remain outside an agreement. In particular, some Soviet missile systems of less than long range, when deployed forward, can achieve much of the same target coverage that is provided by the SS-20, SS-4, and SS-5, even though, to the extent that they are deployed forward for this purpose, such systems would be more vulnerable than the SS-20 to attack by NATO's conventional and nuclear weapons systems. Moreover, the Soviets presently enjoy a substantial advantage in such systems. These factors underscore the significance of the full

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breadth of the Soviet threat in considering the military implications of specific TNF arms control limitations.

10. The SS-20, as well as Soviet theater nuclear missile systems of shorter range, possess refire capabilities with the potential for further growth. For the SS-20, there is evidence that the Soviets are now deploying one refire missile per operational launcher, and we cannot rule out the prospect that they will eventually deploy two or three refires per launcher when the total SS-20 launcher deployment is complete. Because modern mobile Soviet theater nuclear missiles are highly survivable in the field, it must be assumed that they would be able to launch a substantial proportion of such refire missiles, even when some launchers had been rendered inoperable or withdrawn. Refire capabilities thus enhance significantly the overall Soviet nuclear potential and, if wholly unconstrained, could negate substantially the effects of any reductions in the number of launchers achieved in negotiation.

11. A number of important NATO theater nuclear systems have both nuclear and non-nuclear roles. This is especially the case with respect to dual-capable aircraft. These systems are critical to NATO's conventional, as well as theater nuclear, capabilities. Moreover, in relative terms, such systems are more important to NATO than to the Warsaw Pact, given the reliance NATO places on aircraft to counter the large and mobile Warsaw Pact ground force units it faces and the substantially improved Soviet air defenses. Consequently, the implications of any limitations involving dual-capable systems, especially aircraft, do not reside solely in their impact on the nuclear potential of both sides. Moreover, considerations of the role and utility of NATO dual-capable aircraft must take air defenses into account.

12. Quite apart from the potential growth of Soviet TNF systems, current Soviet force levels represent a severe threat to NATO's TNF in particular, as well as to NATO in general. In this regard, a possible Soviet offer to move SS-20 launchers east of the Urals would not diminish the threat to the Alliance, because the SS-20 can threaten major parts of the Alliance even when placed there. Enhancing Alliance security will require, inter alia, reductions in current Soviet TNF force levels. In this context, de jure equal ceilings at substantially reduced levels which produce a militarily significant reduction in the threat would enhance Alliance security and could have long-term beneficial effects on NATO's overall defense posture.

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13. It is essential that Soviet compliance with the terms of any treaty reached in negotiations is verifiable and that the means to accomplish this are appropriate and clearly identified.

14. Any specific arms control limitations proposal relating to TNF, including dual-capable aircraft, must take account of the full breadth of the Soviet threat, and the way in which the general as well as the particular balance might be changed by the implementation of such proposals, both in nuclear and conventional forces.

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TNF FUNCTIONAL REQUIREMENTS STUDY

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I. INTRODUCTION

1. At the May 1981 meetings of the North Atlantic Council and the Defense Planning Committee, NATO Foreign and Defense Ministers requested an updated threat assessment and a study of the Alliance's functional requirements for theater nuclear forces (TNF) upon which US TNF negotiations with the Soviets could rely. The ministers directed that this work be undertaken by the High Level Group (HLG) and Special Consultative Group as matters of immediate priority. This paper, building upon past Alliance work on TNF, particularly the 1979 Integrated Decision Document (IDD), which provides the commonly agreed basis for long-range TNF modernization and arms control, is a response to the second of these two interrelated tasks--the identification of NATO's TNF functional requirements and an assessment of the implications of these requirements for TNF arms control negotiations.

2. The purpose of this study is threefold: (1) to identify NATO's TNF functional requirements--those requirements which must be met to fulfill the functions assigned to TNF in Alliance strategy; (2) to assess the capability of NATO's current and planned TNF to meet these requirements; and (3) given this assessment of capabilities, to refine or expand upon the IDD. It is not the purpose of this study, which does not incorporate a level of detail appropriate for force planning, to generate specific force requirements. Rather, the study is intended to identify NATO's TNF requirements in a generic sense; that is, those broad categories of concern such as survivability, penetrativity, target coverage, and the like which should be considered in relation to arms control involving TNF.

3. The following methodology is used in this study:

-- First, we have compiled a comprehensive list of TNF functions as contained in agreed NATO objectives, strategy, and doctrine (MC-14/3, Provisional Political Guidelines, etc.).

-- Second, we have examined the requirements for the Alliance's TNF capabilities, which are essential to fulfill the designated TNF functions.

-- Third, we have assessed the ability of current and planned forces to meet the identified requirements in the context of the existing and projected Soviet threat. The

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strengths and deficiencies of NATO's TNF structure are then summarized, and areas of major concern are suggested for further consideration by the Alliance. We believe that sustained attention to these areas of concern will be necessary as negotiations between the United States and the Soviet Union unfold and the search for agreement comes to center on numbers, categories, and characteristics of weapons.

-- Fourth, we have reached some general conclusions on the implications for TNF arms control that flow from our appreciation of NATO's functional requirements and the current ability of NATO's present and planned TNF structure to meet them.

II. FUNCTIONS

4. The fundamental objective of NATO's strategy is to ensure security through the deterrence of aggression against the Alliance. In this regard, NATO's primary objective is to deter an attack by Soviet/Warsaw Pact forces before it is launched by (a) making it evident that an attack against the Alliance would be met by an immediate and effective defense and (b) maintaining a military posture in peacetime and the demonstrable resolve to use it in war to convince the Soviets that intimidation would not succeed, and that aggression could initiate a sequence of events which could not be determined in advance and which would involve risks out of all proportion to any advantages they might hope to gain.

5. To deter, NATO must possess a credible capability for effective military response across the full spectrum of conflict possibilities necessary for the maintenance of effective resistance. The Alliance must be, and must be seen to be, able and prepared to escalate the conflict deliberately and in a controlled manner. Although the Alliance does not need to match Soviet/Warsaw Pact force capabilities system for system, it must be capable of responding in an appropriate manner to aggression at any level. To be credible and, therefore, to achieve their deterrent effect, Alliance military options must be plausible responses to an evolving situation in which the Soviet Union/Warsaw Pact will continue to command massive conventional, theater nuclear, and strategic nuclear forces.

6. If aggression occurs, NATO's objective is to preserve the integrity and security of the Alliance area. The principal Alliance aims are to restore the territorial integrity of the Alliance, to restore deterrence, and to terminate the conflict as early as possible. NATO forces must be prepared and determined to use all available and necessary capabilities for this purpose, and this determination must be made evident to the aggressor by a declaratory policy supported fully by credible military capabilities.

7. To meet the security objectives of the Alliance, NATO must maintain a balanced triad of conventional, theater nuclear, and strategic nuclear forces. These required forces should have the following characteristics:

a. Conventional land, sea, and air forces capable of withstanding the initial shock of attack and conducting thereafter a coherent and effective defense in the forward areas.

b. TNF capable of effective use by NATO. These forces should be of such size, balance, and character and so deployed and organized as to provide a vital link between conventional and strategic forces.

c. Strategic nuclear forces manifestly capable of inflicting unacceptable damage, even after surprise nuclear attack, and capable of selective flexible use, separately or in concert with TNF, in deliberate escalation.

8. Each component of NATO's triad of forces should possess an intrinsic credibility. In combination, the triad should produce an interlocking system of deterrence and defense. Thus, NATO's conventional and nuclear capabilities are complementary and inseparable: all three are essential to the implementation of NATO's defense concept. Any impression that NATO's conventional forces can be separated from its nuclear forces--theater and strategic--could lead the Soviets to conclude that the risks of aggression against the Alliance are acceptable, thereby undermining deterrence. For deterrence to be credible, it is equally important that the Soviets conclude that NATO's TNF cannot be separated from the Alliance's strategic forces.

TNF FUNCTIONS

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9. TNF play a central role in the defense concept of the Alliance. With regard to the deterrence of initial aggression, TNF fulfill the following functions:

a. TNF help to deter a conventional attack on the Alliance by putting NATO in a position to initiate the use of theater nuclear weapons, on a scale and in a manner of its own choosing, in order to prevent aggression from succeeding. This capability makes it impossible for the Warsaw Pact accurately to predict NATO's response to conventional aggression, thereby increasing the risks that face them. Moreover, by putting critical enemy military installations, forces, and other targets at risk, TNF complicate Soviet/Warsaw Pact planning for conventional aggression, thus complementing Alliance capabilities and strengthening deterrence in general. Especially where the potential use of NATO TNF against the Soviet second echelon compels Soviet commanders to disperse their armor and other concentrated forces, NATO TNF would reduce the effectiveness of Soviet operational plans for massive attack.

b. TNF deter the use of theater nuclear weapons by the Warsaw Pact by showing that NATO has the potential to use theater nuclear weapons in direct response to aggression at that level.

10. In the event of aggression against NATO, TNF have a central role in the three general types of response envisioned in agreed NATO strategy. These include:

a. Selective use of TNF in direct defense, which seeks to counter aggression on the level at which the Soviet Union/Warsaw Pact chooses to fight.

b. Selective use of TNF in deliberate escalation, which seeks to counter aggression by deliberately raising, in a controlled manner, the scope and intensity of the conflict, making the costs and risks disproportionate to the Soviet's objectives and the threat of further escalation more imminent.

c. Use of TNF, in conjunction with strategic forces, as part of a general nuclear response.

11. The fundamental objective of the selective use of nuclear weapons by NATO is political--to induce the enemy to make the decision to cease his aggression and withdraw. The

initial use of nuclear weapons would represent a basic qualitative change in warfare, involving a crucial decision for the Alliance. The aim would be to restore the territorial integrity of the Alliance and to restore deterrence by demonstrating to the Soviet Union that it had miscalculated NATO's resolve, that NATO was determined to fight on rather than accept defeat, and that to persist in aggression would put Soviet forces at immediate risk and carry the further added risk of nuclear escalation.

12. The value of the selective use of TNF is not that they compensate for deficiencies in conventional forces or that they can secure military victory in the classic sense. NATO's concept does not envisage fighting at the nuclear level in order to achieve military victory. Rather, its central theme is one of controlled escalation with the objective of terminating hostilities as early as possible and at the lowest level of destruction consistent with maintaining the integrity of Alliance territory. NATO's selective use of nuclear weapons must be militarily effective, subject to political control throughout, and able to be applied with shock and decisiveness, while at the same time minimizing undesired effects. The forces withheld, including strategic forces, constitute a strong incentive for the enemy to reassess and, although he may have the military capability to continue, to terminate his aggression and withdraw.

13. A principal function of TNF in Alliance strategy is to strengthen the linkage between conventional and strategic nuclear forces. NATO's TNF must be perceived as coupled to, but not a substitute for, the other components of the NATO triad. TNF are thus linked to the conventional and strategic nuclear forces in a continuum of deterrent capability.

14. TNF serve the important political function of demonstrating the solidarity and cohesion of the Alliance as well as the commitment of all the allies to a collective deterrent strategy, including the nuclear component. This demonstration through the active participation of NATO member countries in planning, structuring, basing, and public support makes evident the firm resolve of NATO to respond to aggression. The visible and direct involvement in peacetime of non-nuclear members of the Alliance in NATO's TNF posture is essential to underline the united commitment to deterrence. Should deterrence fail, to make clear the collective character of TNF use would be an impor-

tant factor in demonstrating the cohesion and resolve of the Alliance.

III. REQUIREMENTS

GENERAL REQUIREMENTS

15. NATO seeks to deter aggression at all levels by structuring its forces to enable them to respond to any contingency. Moreover, NATO's force structure must be sufficiently flexible to meet even unforeseen circumstances. This requirement for flexibility applies to the capabilities for NATO's triad of forces--conventional, theater nuclear, and strategic nuclear.

16. In the event of hostilities, the specific circumstances would determine the political and military objectives of any use of TNF by NATO. Given the inevitable uncertainty about the scale of a conventional attack against NATO and whether the enemy would resort to the use of nuclear weapons, it is difficult to predict what targets, scale of use, and geographical area would achieve the proper balance between conveying NATO's determination and attempting to control risks of escalation. In short, the flexible response strategy seeks to deter by leaving the Soviets uncertain as to the specific nature of NATO's response but certain that NATO possesses the resolve and the wide range of capabilities to counter aggression at any level.

17. To fulfill the functions assigned to TNF in agreed Alliance strategy, a number of political requirements must be met. These requirements, essential to demonstrate the credibility and linkage central to an effective deterrent, are as follows:

a. Alliance Solidarity in Objectives: TNF serve the important political function of underlining NATO's solidarity of objectives and of demonstrating a determined and united commitment to preserving the security and integrity of the Alliance.

b. Widespread Alliance Participation: Alliance solidarity of objectives is best demonstrated by widespread participation in NATO nuclear planning and risk sharing. Widespread basing, necessitated by range requirements, strike assurance, and survivability requirements, reinforces

the credibility of NATO's TNF structure--and thus enhances deterrence--by underlining the collective contribution of NATO members to achievement of Alliance security objectives.

c. Visibility: A credible deterrent requires a visible commitment by Alliance members to take the necessary steps to ensure an adequate and reliable defense posture. NATO's TNF policy, as it applies to force structure, employment doctrine, and declaratory policy, provides an unmistakable signal that the Alliance is capable and willing to use nuclear weapons in its defense.

d. Stability: For stable deterrence, it is essential that the Alliance maintain the perception of an overall balance providing adequate military capabilities relative to Soviet/Warsaw Pact forces. With regard to TNF, it has never been NATO's aim to match the Warsaw Pact nuclear capability weapon for weapon or system for system; nor is it militarily essential to effective defense and deterrence that it be able to do so. However, NATO cannot permit, either in fact or in perception, a clear imbalance, which erodes the capability of the deterrent by providing an incentive for the Soviets to initiate, preempt, or escalate the conflict. Only through the possession of a strong and survivable deterrent capability will the desired stability be achieved.

e. Alliance Resolve to Maintain Adequate TNF: The credibility of the NATO deterrent requires that the Alliance continue to demonstrate its commitment to maintain adequate forces--conventional, theater nuclear, and strategic nuclear--to deter the full range of potential aggression. This demonstration of commitment is best achieved through NATO's willingness--clearly perceived by the Soviet Union--to develop, acquire, and maintain a fully effective force structure in the face of an expanding Soviet nuclear threat.

18. Integral to the above political requirements are a number of military requirements, which must be met to fulfill the deterrent and defense functions assigned to NATO's TNF in the context of flexible response. The Alliance's TNF structure must, to fulfill these functions, provide for a broad spectrum of credible military options, which hold at risk a wide range of Soviet/Warsaw Pact targets. This array includes:

a. Long-range/theater nuclear targets, primarily targets in the Soviet Union while not excluding targets in

non-Soviet Warsaw Pact countries, against which long-range TNF would be employed. Specific targets would include airfields; theater nuclear missile bases and installations; nuclear warhead storage sites; command, control, and communication (C³) sites; and the like. NATO's capability to execute strikes against targets at long range is critical to prevent the mistaken belief that Soviet territory would be a sanctuary in an attack against NATO.

b. Medium-range targets, including strikes on second echelon targets and disruption of enemy lines of communications deep in Warsaw Pact territory. Specific targets would include ground force units, marshalling areas, airfields, theater nuclear missile systems, storage and C³ sites, etc.

c. Short-range/battlefield targets, including ground force units and other targets in the vicinity of the battlefield.

19. To provide the military capability to hold this array of targets at risk, NATO's TNF must meet several deployment and operational requirements. Among these requirements are the following:

a. Adequate Coverage at All Ranges: NATO's TNF, in conjunction with strategic forces, must be able to conduct nuclear options over a wide geographical area, extending from the battlefield area to the territory of the Soviet Union itself. A comprehensive mix of TNF systems with different ranges and characteristics is necessary to provide the requisite capabilities.

b. Balance in Deployments Among Geographic Areas: It is essential that TNF be suitably based within the Alliance to enhance their operational and deterrent effectiveness. Forward deployment visibly underlines the commitment of the Alliance to the forward defense of its territory against attack. Rearward basing of systems of greater range, on the other hand, can offer improved survivability and greater flexibility in targeting. It is also important that in times of tension NATO's TNF be readily available to defend all areas where aggression might occur. Were this not the case, the Warsaw Pact could choose to attack those areas where, if NATO's conventional forces were overwhelmed, the Alliance would have few effective options for selective use of TNF.

c. Mix to Ensure Flexibility: To execute the wide range of nuclear options established in Alliance strategy, NATO requires survivable and flexible TNF adequately composed to be employed effectively. Given the uncertainties of the nature and magnitude of potential aggression and given the military and political functions which TNF may be called upon to serve, different systems with different operational characteristics are required by the Alliance.

OPERATIONAL REQUIREMENTS

20. In addition to these general requirements, NATO's TNF must meet certain operational requirements, which will differ considerably according to a number of factors, including the range and deployment location of the particular system, the assigned target objective(s), and the threat which the system faces. In short, the stringency of the requirements below is both system and mission dependent. The requirements are:

a. Pre-Launch Survivability: Adequate overall survivability is essential to deterrence. Therefore, NATO's TNF must be sufficiently survivable so as to ensure the availability of appropriate and viable TNF responses. NATO's TNF must be able to survive attacks by enemy conventional, chemical, and nuclear forces. Survivability can be enhanced by a number of means, including dispersion and mobility, redundancy, hardened shelters (against initial conventional attacks), and camouflage/deception. While NATO's strategic forces provide the bulk of the deterrence of a massive nuclear attack against the Alliance's TNF, it is essential that Soviet/Warsaw Pact forces not be able to destroy key elements of TNF with relatively few and limited strikes. For example, the mobility and number of short-range systems improve their survivability, while their limited range and proximity to the battlefield make them more vulnerable. For medium- and long-range systems, pre-launch survivability is achieved primarily through mobility, dispersal, and wide deployment, all of which should discourage Soviet thought of preemption.

b. Target Acquisition and Responsiveness: It is critical that NATO possess adequate and survivable support capabilities which provide timely target information on both fixed and time-urgent mobile targets. Mobile targets, particularly second and third echelon forces, present special

acquisition and engagement difficulties. It is also essential that TNF systems, especially those designed to hold mobile targets at risk, be capable of rapid retargeting. In addition, TNF must have the necessary responsiveness (generation time/time to target) required to engage the entire target array effectively.

c. Command, Control, and Communication (C³): It is essential that there be close political control over the use of nuclear weapons as set forth in the consultation guidelines established by the Alliance as well as adequate, secure, and survivable C³ capabilities for the execution of TNF options.

d. Reliability: It is essential that any given delivery vehicle and the theater nuclear force as a whole have a high probability of performing its mission. The probability of launch, in-flight reliability, and reliability of detonation must all be high. To ensure reliability, in addition to the technical requirements of the system, NATO must have well trained personnel, exercised frequently, to insure operational readiness.

e. Safety and Security: Safety and security measures to prevent inadvertent or accidental detonation must be a paramount consideration in the design and operational procedures of NATO's TNF under peacetime or wartime conditions. It is also essential to achieve maximum security against sabotage, theft, and unauthorized use at storage and deployment sites while maintaining adequate accessibility in time of crisis.

f. Penetrativity: In the execution of nuclear options, it is critical that NATO's TNF be able to penetrate Soviet/Warsaw Pact defenses. Because long-range dual-capable aircraft and cruise missiles must penetrate more hostile defenses over greater distances, assuring the penetrativity of these systems is a more demanding task than for shorter-range systems.

g. Terminal Effects: The selective use of nuclear weapons requires that the necessary degree of damage be inflicted without disproportionate collateral effects. The results should be no more and no less than those required by the politico-military objective. This requires weapon systems with delivery accuracy and a range of warhead yields which can be matched to specific employment requirements.

Existing SACEUR constraints to be used in certain geographical areas and criteria for permissible collateral damage are important planning factors. System accuracy and yield selection enhance targeting flexibility and can contribute to the objective of controlled escalation.

SECTION IV - ASSESSMENT OF NATO TNF CAPABILITIES

GROWTH AND CAPABILITIES OF THE SOVIET THREAT

21. During the past two decades, the Soviet Union has engaged in a dramatic expansion and modernization of its military capabilities--conventional, theater nuclear, and strategic nuclear forces. These forces are increasingly offensive in posture and capable of supporting Soviet political and military objectives. Despite the Soviet claim to desire detente and arms control, the overall pace of the Soviet/Warsaw Pact buildup has remained ominously steady over the last 15 years. This buildup, which exceeds any legitimate defensive needs, has given Soviet/Warsaw Pact forces increasing options and flexibility for the use of military force at all levels. With respect to TNF, the Soviets are engaged in a dynamic buildup of offensive systems across the board and are in a good position to undertake further theater nuclear force improvements in the 1980's. The magnitude of the Soviet/Warsaw Pact TNF buildup, in terms of both increased numbers and enhanced weapon capabilities, applies to systems of all ranges.

22. The general implications of the High Level Group's updated Threat Assessment Paper are as follows:

a. The sustained expansion and modernization of Soviet/Warsaw Pact forces have enhanced the Warsaw Pact's ability to fight a combined conventional/nuclear war in Europe and, in particular, to initiate conflict by either a preemptive, theater-wide nuclear strike, or by attack with non-nuclear means against NATO's nuclear and other capabilities.

b. The comprehensive Soviet TNF modernization program currently underway will provide the Warsaw Pact with a significant range of complementary nuclear and non-nuclear capabilities and employment options. ~~The increased ranges and accuracies (and the improved response times)~~ of the new Soviet TNF systems (SS-21, SS-22, SS-X-23, SS-20, BACKFIRE,

and improved dual-capable fighter aircraft) provide a significant increase in force capability and flexibility in the delivery of nuclear weapons. Of special significance in this context are:

-- Increased ranges, which fulfill long-standing doctrinal goals for theater support at all ranges, permit increased rearward deployment for survivability, increased overlap in target coverage, reduced resupply distances, and improved capability for rapid mobilization (since the new surface-to-surface missiles have extensive target coverage from peacetime locations).

-- The improved Soviet theater nuclear missile force also hedges against over-reliance on aircraft operating from vulnerable bases and liable to suffer attrition in conventional operations before they are needed for their nuclear role.

-- Greater accuracy and smaller yields permit more discriminating use, less collateral damage, and higher damage expectancy against targets in the NATO area.

c. The enhanced Soviet/Warsaw Pact capability affects the pre-launch survivability of NATO's TNF as well as conventional forces and supporting systems. The Soviet capacity for preemptive attack against NATO forces needs to be considered.

d. The Soviet/Warsaw Pact force structure is compatible with a nuclear war-fighting and war-winning strategy. If NATO TNF were inadequate for direct defense or deliberate escalation, deterrence would be gravely weakened. Under such circumstances, the risk of nuclear blackmail would be heightened and the nuclear threshold lowered.

NATO AND SOVIET/WARSAW PACT TNF ASSESSMENT

23. Short-Range TNF: NATO's current short-range TNF consist of dual-capable 155mm howitzers, 8-inch howitzers, HONEST JOHN rockets and LANCE.

24. NATO's short-range TNF hold at risk Soviet/Warsaw Pact ground force units operating on or near the immediate battlefield. (It must, of course, be noted that other NATO TNF, particularly medium-range dual-capable aircraft, also

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have the capability to strike targets at short range.) Soviet/Warsaw Pact strategy and planning appear to envision the conduct of a number of successive breakthrough operations in selected sectors of the front, preceded by massive air and ground fire support in the immediate vicinity of the attacks. The objective of such attacks would be to achieve a rapid advancement into NATO territory by enveloping and disrupting the main lines of NATO's forward, mobile defense. Since such breakthrough operations would be conducted with relatively high concentration of forces, Soviet/Warsaw Pact units could present fleeting but vulnerable targets to attacks by NATO's short-range TNF, in the event that NATO conventional forces could not contain the attacks.

25. NATO's short-range TNF, therefore, afford a responsive and flexible capability, which reinforce deterrence by imposing major uncertainties on Soviet/Warsaw Pact calculations of the risks and prospects of successful breakthrough operations. The threat of NATO nuclear attacks from short-range TNF would make it more difficult for the Warsaw Pact to plan optimal concentrations and avenues of attack in either nuclear or conventional operations, thus contributing to the prospects for effective conventional defense by the Alliance. If a NATO nuclear response is required to stem breakthroughs, short-range TNF would provide effective capabilities to disrupt and/or halt the momentum of Soviet/Warsaw Pact first echelon forces.

26. To be fully effective, NATO's short-range TNF require survivability, responsiveness at the corps and division levels, high accuracy and low yields, rapid and secure access to nuclear ammunition, and broad deployment in adequate numbers to ensure availability across wide areas of the front. With the exception of LANCE, the nuclear warheads in NATO's current short-range TNF stockpile are aging, the systems are range-limited, and the overall deployment is not balanced sufficiently to meet the threat. In particular:

-- The short range of NATO's current nuclear artillery capability places undesirable limitations on the options for its use. Additionally, the ages and outdated technology of the currently deployed NATO short-range TNF affect their reliability, responsiveness, logistical flexibility, and their overall military effectiveness. However, modernized nuclear artillery projectiles could largely correct these deficiencies through their improved ranges, accuracy, yield

selection, transportability, responsiveness, safety, and security.

-- A disproportionate share of NATO's short-range TNF capability, relative to the threat arrayed against NATO, is concentrated with US forces in the central region.

27. At present, NATO possesses a numerical advantage in short-range TNF vis-a-vis the Warsaw Pact. However, trends in relative capabilities between NATO and the Warsaw Pact in short-range TNF are undergoing significant change. Qualitatively, in the case of Soviet/Warsaw Pact forces, the introduction of the SS-21 missile represents a major advance in accuracy, range, and survivability in comparison to the older generation FROG-7 rocket system that is widely deployed in Warsaw Pact units. The Soviet Union has introduced a nuclear capability for its new self-propelled 203mm howitzer and 240mm mortar. These provide greatly improved mobility, range, and refire capacity. Although currently deployed only in the Soviet Union, a number of Soviet 203mm/240mm units could be used in support of operations against NATO and could be deployed to Eastern Europe at any time. In terms of target coverage, the range of Soviet nuclear-capable artillery and the high proportion of FROG-7/SS-21 in the Warsaw Pact short-range TNF inventory, relative to comparable NATO systems, means that NATO ground forces, bases, dual-capable systems, command and control, and support facilities will be put at greater risk than comparable Warsaw Pact targets. In short, the Warsaw Pact is increasingly capable of carrying out combined arms operations (in conjunction with other forces discussed below), which are an integral part of its doctrine.

28. Medium-Range TNF: Current NATO land-based medium-range TNF consist of dual-capable tactical strike aircraft (i.e., F-4, F-104, BUCCANEER, JAGUAR) and the PERSHING 1A ballistic missile system. In addition, there are some dual-capable A-6 and A-7 aircraft aboard US carriers assigned to NATO.

29. NATO medium-range TNF hold at risk a wide range of targets at varying depths into Warsaw Pact territory, which would support and sustain breakthrough operations against NATO. Medium-range targets include: fixed targets such as airfields, command and control sites, air defenses, logistics and transportation centers, military installations, and nuclear weapons storage sites. NATO dual-capable aircraft also provide a capability for supplementing short-

range TNF in support of the battlefield and (to a lesser extent) engaging mobile and transitory targets among Warsaw Pact second and third echelon forces. The capability of medium-range TNF to threaten these Warsaw Pact second and third echelon forces with which the Pact would reinforce breakthrough operations against NATO, and to deter Warsaw Pact use of nuclear weapons in combined arms operations, would also create major uncertainties in Soviet calculations of the success of conventional or nuclear attacks against NATO and make clear the escalatory risks involved. Moreover, NATO medium-range TNF contribute to target coverage in general nuclear response.

30. NATO's present medium-range TNF capabilities have important limitations in meeting the necessary requirements in support of NATO's strategy of flexible response. A major proportion (80 percent) of NATO's land-based medium-range capability resides in its dual-capable aircraft. On the one hand, dual-capable aircraft provide valuable flexibility for conventional or nuclear operations, in weapon-load variations, in coverage of targets at varying depths into enemy territory, and for use against transitory targets which can be located by pilots. On the other hand, they suffer from vulnerability to nuclear attack and (to a lesser extent) to conventional attack. Dual-capable aircraft will also suffer attrition in conventional operations. The post-launch vulnerability of aircraft is much greater than that of missiles, particularly when aircraft must traverse long distances over enemy territory through an extensive air defense network. This can require the assignment of several aircraft to a single target to achieve adequate assurance of a successful strike.

31. NATO's current medium-range missile force consists of 180 PERSHING 1A launchers in the central region. Upon alert, the PERSHING system achieves survivability through mobility and dispersal. The PERSHING 1A missile, with a range of 740km, allows time-urgent coverage of fixed targets in central non-Soviet Warsaw Pact territory. The yield characteristics of the PERSHING 1A, however, limit its utility in selective use options.

32. NATO possesses only a limited capability for engaging mobile second and third echelon forces and their supporting nuclear and conventional systems. The Alliance has few systems with the combination of yield, accuracy, survivability, and penetrativity to provide options to engage

such targets effectively. The limited capability of NATO forces to detect, identify, and acquire mobile targets beyond 100km, process and communicate the target information, and rapidly allocate and deliver strikes significantly impedes NATO's ability to put such targets at risk.

33. The trend in relative TNF medium-range capabilities between NATO and Soviet/Warsaw Pact forces is continuing to change in favor of the Warsaw Pact and to affect the ability of NATO medium-range TNF to meet their deterrence and defense objectives. Quantitative and qualitative imbalances in comparative medium-range capabilities are particularly notable in surface-to-surface missiles. Quantitatively, Soviet/Warsaw Pact forces possess over 700 SCUD and SCALEBOARD launchers in contrast to NATO's 180 PERSHING IA launchers (108 of which are scheduled to be replaced by PERSHING II deployments). Although PERSHING II will have the flexibility to be used against targets at the medium range, its primary purpose, consistent with NATO's decision to modernize its long-range TNF, is to hold at risk targets at extended depth into Warsaw Pact territory, primarily in the Soviet Union. Qualitatively, the major improvements of the modern medium-range systems replacing SCUD and SCALEBOARD (the SS-22 and the soon-to-be-deployed SS-X-23) include greatly improved accuracy and, for the SS-X-23, improved range, which further contribute to the Soviet/Warsaw Pact advantage. With regard to dual-capable aircraft, while the Soviet/Warsaw Pact capability has been significantly upgraded in the areas of range and pay load, the introduction of the F-16 and TORNADO into the NATO armory will ensure at least a qualitative balance in this category. Furthermore, the addition of the airborne warning and control system (AWACS), as well as planned improvements in NATO's air defense capabilities, should partially offset the Soviet/Warsaw Pact quantitative superiority in dual-capable aircraft. However, the increasing problems of survivability and penetrativity associated with dual-capable aircraft will continue to affect directly and substantially NATO's TNF medium-range capabilities and requirements. While Soviet/Warsaw Pact dual-capable aircraft have dramatically improved qualitatively, they have limitations comparable to those faced by NATO's dual-capable aircraft force, in particular, vulnerability to nuclear attack. The redundancy in Soviet/Warsaw Pact medium-range TNF missiles serves largely to meet essential Soviet/Warsaw Pact nuclear targeting objectives, ensuring a highly survivable force that can reach targets throughout the depth of NATO terri-

tory. In sum, the Warsaw Pact has a balanced mix of medium-range theater nuclear systems consisting of a variety of aircraft and missiles, while NATO's medium-range nuclear systems are heavily dependent on less survivable dual-capable aircraft.

34. Long-Range TNF: At present, NATO's long-range TNF systems consist of 170 US F-111's and 56 UK VULCANS stationed in Great Britain. (Strategic assets available to NATO include UK POLARIS missiles and US POSEIDON reentry vehicles committed to SACEUR.) In accordance with the December 1979 Alliance decision, NATO will deploy 572 long-range systems beginning at the end of 1983.

35. The function of NATO's long-range TNF is to enhance deterrence by ensuring there are no gaps in NATO's spectrum of TNF options and to strengthen the linkage of TNF to the strategic forces of the Alliance. More specifically, the objective is to minimize the risk that the Soviets might believe--however mistakenly--that they could use long-range forces to make, or threaten to make, limited strikes against Western Europe from a "sanctuary" in the Soviet Union.

36. In order to achieve its aim, NATO's long-range TNF must be able to hold at risk high-value fixed targets such as airfields, C³ sites, nuclear warhead storage sites, and theater nuclear missile bases, primarily located in the Soviet Union itself, while not excluding targets in non-Soviet Warsaw Pact countries. The flexibility of long-range dual-capable aircraft would also permit their use against mobile targets inside enemy territory to the extent they can be located and targeted. Destruction of such long-range fixed and mobile targets may not have an immediate impact upon the ability of Soviet/Warsaw Pact forces to conduct operations at the front but could directly impede the ability of these forces to sustain such operations effectively.

37. NATO's current long-range dual-capable aircraft suffer from the same deficiencies with regard to survivability and penetrativity, as mentioned in the discussion of medium-range dual-capable aircraft. In fact, the problem of penetrativity for long-range dual-capable aircraft is even more acute as a consequence of the greater distances which must be penetrated through hostile air space by long-range missions. After the UK VULCANS are phased out, US F-111's would be the only aircraft component of the long-range

theater nuclear force. NATO's modernized long-range TNF will assure a survivable force capable of penetrating enemy defenses for selective options (and as a contribution to general nuclear response) extending into Soviet territory, making the costs and risks of escalation involved in any attack on NATO manifestly clear to the Soviet Union.

38. Quantitative and qualitative trends between NATO and Soviet long-range TNF capabilities have undergone dramatic changes in the recent past. Of most significance with regard to the long-range TNF balance is the dynamic Soviet deployment of the MIRVed SS-20 missile. As of August 1981, 252 SS-20 launchers are operational, and an additional 9 bases with 81 launchers are under construction. The striking qualitative improvements built into the SS-20, including its multiple warheads and much greater accuracy and survivability, are particularly relevant to the impact of the threat on NATO's TNF requirements. In the same way, the greater range, pay load, and penetrativity of the BACKFIRE bomber represent a significant qualitative increase in the threat.

39. With regard to NATO's defensive nuclear systems, the principal conclusions of the 1980 HLG study are summarized as follows:

a. The nuclear NIKE HERCULES, although vulnerable and approaching obsolescence, provides a contribution to deterrence of Soviet/Warsaw Pact air attacks at medium and high altitude. As for the future role of nuclear air defense, no intrinsic requirement--political, military, or perceptual--exists to maintain nuclear air defense capabilities indefinitely. From a military standpoint, improved and more survivable conventional air defense systems (e.g., PATRIOT) with a single shot probability of kill approaching that of nuclear NIKE HERCULES should serve to maintain an effective air defense posture against the full altitude spectrum of enemy air attacks. Additionally, conventional air defense has the advantage of not being dependent on timely nuclear release decisions, thus allowing greater flexibility to bring the full range of air defense capabilities to bear against the air threat. Hence, the phasing out of nuclear air defense capability is not likely to undermine the credibility of NATO's nuclear deterrent force as long as reductions are seen as part of an overall air defense modernization program in which aging nuclear air defense systems are replaced by new, more capable conventional

weapons. With regard to NIKE HERCULES, as these systems are phased out as part of NATO's air defense modernization program, additional NIKE HERCULES warheads will be retired.

b. Atomic demolition munitions (ADM) currently deployed in Europe continue to play a useful role in the NATO deterrent posture and are a factor which the Warsaw Pact would take into account in developing its war plans, gauging overall chances for military success and deciding the fundamental issue of whether to initiate an attack. If deterrence fails, ADM's are an effective and efficient means of creating obstacles to enemy movement. In the future, as new, more effective conventional obstacle munitions become available and are deployed, however, the need for ADM's should diminish. Whether, in light of conventional improvements, the capabilities afforded by ADM's will still be required over the longer term is uncertain.

DEFICIENCIES IN NATO TNF

40. Existing Deficiencies in TNF Capabilities: The sustained Soviet/Warsaw Pact expansion of military capabilities across the board has a direct impact upon NATO's ability to meet its TNF functional requirements. Those requirements which are most affected by this buildup are:

a. Adequate Coverage: The updated data on the Soviet/Warsaw Pact threat serve to reinforce our prior concern that the Soviet/Warsaw Pact buildup in TNF could create an environment in which the Soviets could eventually come to believe that NATO lacked a credible response at certain levels of conflict and that they could, therefore, launch or threaten to launch a nuclear attack on Western Europe without risk of an adequate response. Such a situation would likely result in increased political pressures and attempts to intimidate NATO members. It was these very concerns that prompted NATO's December 1979 decision to deploy 572 long-range systems and, at the same time, offer the Soviet Union arms control negotiations. Given the continued growth in SS-20 capabilities, the NATO rationale for that decision is even more relevant today. Likewise, the Soviet/Warsaw Pact expansion and modernization of short- and medium-range TNF capabilities have given the Warsaw Pact increasing advantages in target coverage at various ranges. If NATO's deterrence is to be credible, the Alliance must possess an adequate spectrum of survivable, militarily

effective options to counter enemy capabilities at all ranges and throughout the depth of Warsaw Pact territory.

b. Pre-Launch Survivability: The Soviet/Warsaw Pact military buildup of conventional and nuclear forces increases the vulnerability of much of NATO's forces, especially NATO's TNF. For short-range TNF, the problem is largely one of surviving in an environment of almost constant contact with hostile forces. At the medium and long ranges, the problem is more one of maintaining pre-launch survivability.

-- At the medium range, NATO's TNF capabilities consist largely of dual-capable aircraft. Given that dual-capable aircraft operate from a relatively limited number of bases of known location, a Soviet preemptive attack against these bases cannot be ruled out. The implications of this vulnerability for deterrence and stability in times of crisis or conflict are obvious.

-- At the long range, NATO's plans to modernize its TNF with ground-launched cruise missiles and PERSHING II missiles will improve survivability. Because these systems will disperse, they will be highly survivable in the face of all but a bolt-out-of-the-blue nuclear attack, provided that they are exercised and operated in a manner that recognizes the inevitably ambiguous nature of the warning likely to be available in times of tension or crisis. However, they are not yet in the field, and it will be some time before their deployment is complete. Even when long-range TNF are deployed, survivability problems will remain for other elements of NATO TNF.

-- The threat to the survivability of NATO's TNF and other forces is not confined to Soviet long-range TNF. The size, composition, and character of Soviet/Warsaw Pact medium-range TNF are such that their capabilities largely duplicate the target coverage of NATO Europe provided by Soviet long-range TNF.

-- The overall expansion of Soviet/Warsaw Pact TNF capabilities compounds the survivability problem associated with the supporting elements of NATO's TNF, as well as major elements of NATO's overall defense posture.

c. Target Acquisition and C³ Capabilities: NATO target surveillance, acquisition, and C³ capabilities are essential

to a credible capability to execute the wide range of options for which NATO's strategy calls. The restricted capability of NATO forces to detect, identify, and acquire mobile targets in excess of 100km, process and communicate information on such targets, and rapidly allocate and deliver strike resources seriously limits the Alliance's ability to use medium- and long-range TNF capabilities effectively and in a timely manner against mobile targets and, thus, to hold Soviet/Warsaw Pact second and third echelon forces at risk.

d. Penetrativity: Because of the present major reliance of NATO's medium- and long-range TNF capabilities on dual-capable aircraft, Soviet/Warsaw Pact efforts in improving active and passive air defenses have diminished the Alliance's overall ability effectively to carry out nuclear strikes. Although aircraft have unique and flexible capabilities that contribute to NATO's TNF posture, dual-capable aircraft should be complemented by adequate survivable missile capabilities to ensure fully effective deterrence.

AREAS FOR ALLIANCE CONSIDERATION

41. To maintain fully effective deterrent and adequate defense capabilities, NATO should continue to improve its TNF structure to correct the deficiencies identified above. Accordingly:

a. NATO TNF should be sufficiently survivable, flexible, and adequately composed to meet Alliance strategy in the light of the threat.

b. NATO's short-range TNF should have the necessary distribution, survivability, target coverage, responsiveness, and effectiveness.

c. NATO's medium-range TNF should be survivable and able to hold at risk critical targets threatening the Alliance.

d. NATO should proceed on schedule with the planned deployment of new long-range TNF and negotiations on TNF arms control.

e. NATO should give continuing attention to improving capabilities for tactical warning, surveillance, target

acquisition, command and control, and improved information processing to enhance the Alliance's TNF effectiveness and, hence, their credibility and deterrent effect.

SECTION V - MILITARY IMPLICATIONS RELATING TO ARMS CONTROL

42. The foregoing analysis of NATO's TNF requirements has led the HLG to reflect on a number of crucial military implications of the forthcoming negotiations between the United States and the Soviet Union. The considerations set out below are aimed at deepening our understanding of the implications for NATO security of positions the United States may take into negotiations with the Soviet Union and of proposals that the Soviets make in those negotiations. We expect that continuing examination will be required of various possible force structures which could arise out of proposals tabled as the substance of the negotiations unfolds.

43. During HLG deliberations, it was often observed that reductions in the level of some TNF would increase the importance of those systems that remain outside an agreement. In particular, some Soviet missile systems of less than long range, when deployed forward, can achieve much of the same target coverage that is provided by the SS-20, SS-4, and SS-5, even though, to the extent that they are deployed forward for this purpose, such systems would be more vulnerable than the SS-20 to attack by NATO's conventional and nuclear weapons systems. Moreover, the Soviets presently enjoy a substantial advantage in such systems. These factors underscore the significance of the full breadth of the Soviet threat in considering the military implications of specific TNF arms control limitations.

44. The SS-20, as well as Soviet theater nuclear missile systems of shorter range, possess refire capabilities with the potential for further growth. For the SS-20, there is evidence that the Soviets are now deploying one refire missile per operational launcher, and we cannot rule out the prospect that they will eventually deploy two or three refires per launcher when the total SS-20 launcher deployment is complete. Because modern mobile Soviet theater nuclear missiles are highly survivable in the field, it must be assumed that they would be able to launch a substantial proportion of such refire missiles, even when some launchers had been rendered inoperable or withdrawn.

Refire capabilities thus enhance significantly the overall Soviet nuclear potential and, if wholly unconstrained, could negate substantially the effects of any reductions in the number of launchers achieved in negotiation.

45. A number of important NATO theater nuclear systems have both nuclear and non-nuclear roles. This is especially the case with respect to dual-capable aircraft. These systems are critical to NATO's conventional, as well as theater nuclear, capabilities. Moreover, in relative terms, such systems are more important to NATO than to the Warsaw Pact, given the reliance NATO places on aircraft to counter the large and mobile Warsaw Pact ground force units it faces and the substantially improved Soviet air defenses. Consequently, the implications of any limitations involving dual-capable systems, especially aircraft, do not reside solely in their impact on the nuclear potential of both sides. Moreover, considerations of the role and utility of NATO dual-capable aircraft must take air defenses into account.

46. Quite apart from the potential growth of Soviet TNF systems, current Soviet force levels represent a severe threat to NATO's TNF in particular, as well as to NATO in general. In this regard, a possible Soviet offer to move SS-20 launchers east of the Urals would not diminish the threat to the Alliance, because the SS-20 can threaten major parts of the Alliance even when placed there. Enhancing Alliance security will require, inter alia, reductions in current Soviet TNF force levels. In this context, de jure equal ceilings at substantially reduced lower levels which produce a military significant reduction in the threat would enhance Alliance security and could have long-term beneficial effects on NATO's overall defense posture.

47. It is essential that Soviet compliance with the terms of any treaty reached in negotiations is verifiable and that the means to accomplish this are appropriate and clearly identified.

48. Any specific arms control limitations proposals relating to TNF, including dual-capable aircraft, must take account of the full breadth of the Soviet threat, and the way in which the general as well as the particular balance might be changed by the implementation of such proposals, both in nuclear and conventional forces.