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A NET ASSESSMENT OF TACTICAL NUCLEAR DOCTRINE FOR THE INTEGRATE--ETC(U)

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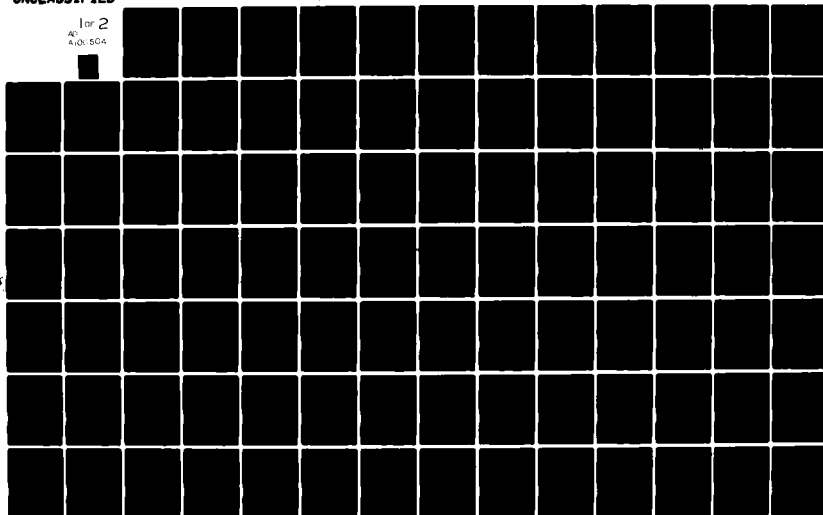
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A NET ASSESSMENT OF TACTICAL NUCLEAR DOCTRINE FOR THE INTEGRATED BATTLEFIELD.

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LEVEL II

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JUN 22 1981

1 Sep 1980

Interim Report, 1 May 1980 - 1 Sep 1980

CONTRACT No. DNA 001-80-C-0283

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REPORT DOCUMENTATION PAGE		READ INSTRUCTIONS BEFORE COMPLETING FORM
1. REPORT NUMBER DNA 5452Z	2. GOVT ACCESSION NO. AD-A100 504	3. RECIPIENT'S CATALOG NUMBER
4. TITLE (and Subtitle) A NET ASSESSMENT OF TACTICAL NUCLEAR DOCTRINE FOR THE INTEGRATED BATTLEFIELD		5. TYPE OF REPORT & PERIOD COVERED Interim Report for Period 1 May 80—1 Sep 80
		6. PERFORMING ORG. REPORT NUMBER
7. AUTHOR(s) Richard I. Wiles Herbert T. Casey Reed E. Davis, Jr. William R. Kraft, Jr.		8. CONTRACT OR GRANT NUMBER(s) DNA 001-80-C-0283
9. PERFORMING ORGANIZATION NAME AND ADDRESS ORI, Inc. 1400 Spring Street Silver Spring, Maryland 20910		10. PROGRAM ELEMENT, PROJECT, TASK AREA & WORK UNIT NUMBERS Subtask V99QAXNL123-46
11. CONTROLLING OFFICE NAME AND ADDRESS Director Defense Nuclear Agency Washington, D.C. 20305		12. REPORT DATE 1 September 1980
14. MONITORING AGENCY NAME & ADDRESS (if different from Controlling Office)		13. NUMBER OF PAGES 188
		15. SECURITY CLASS. (of this report) UNCLASSIFIED
		15a. DECLASSIFICATION/DOWNGRADING SCHEDULE
16. DISTRIBUTION STATEMENT (of this Report) Approved for public release, distribution unlimited.		
17. DISTRIBUTION STATEMENT (of the abstract entered in Block 20, if different from Report)		
18. SUPPLEMENTARY NOTES This work sponsored by the Defense Nuclear Agency under RDT&E RMSS Code B325080464 V99QAXNL12346 H2590D.		
19. KEY WORDS (Continue on reverse side if necessary and identify by block number) Doctrine, Tactical Nuclear Warfare (TNW), Integrated Battlefield, Net Assessment, U.S./NATO, Soviet/Warsaw Pact, Asymmetries, Doctrinal Alternatives TNW Issues, TNW Requirements, TNW Tasks, Likely Scenarios		
20. ABSTRACT (Continue on reverse side if necessary and identify by block number) After analyses of U.S./NATO and Soviet doctrines for the conduct of tactical nuclear warfare, the opposing doctrines are compared and asymmetries are identified. Doctrinal requirements are developed based upon required battle and preparatory tasks, and in consideration of likely combat scenarios. The asymmetries and the requirements are then fused to produce tactical nuclear warfare issues. These issues generate statements of doctrinal alternatives, and methodologies for the evaluation of these suggested alternatives are proposed.		

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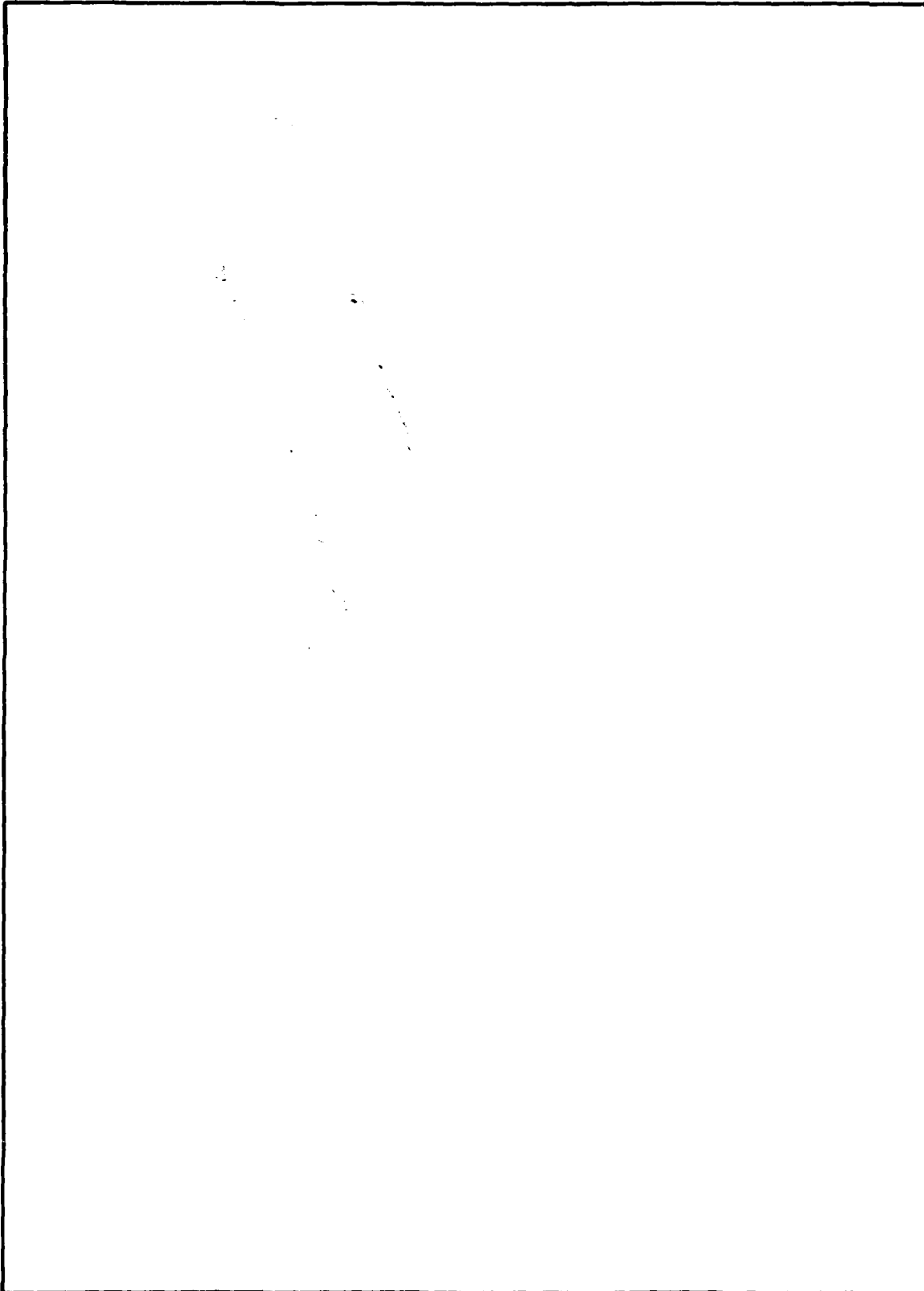
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SUMMARY

The purpose of the Net Assessment of Tactical Nuclear Doctrine for the Integrated Battlefield is to:

- Analyze tactical nuclear warfare doctrines of United States/North Atlantic Treaty Organization (U.S./NATO) and Union of Soviet Socialist Republics/Warsaw Pact (Soviet/Pact)
- Judge effect of asymmetries
- Develop doctrinal alternatives
- Determine evaluation methodology.

The net assessment is focused on the warfighting capability at the corps level and is presented in the context of four scenarios (Section V):

- Pact strikes first.
 - I Pact forces deployed, NATO force in garrison, little warning
 - II Both sides deployed, little warning
 - III After a period of conventional conflict.

- NATO strikes first.

IV After a period of conventional conflict.

Asymmetries (Section VI) were evident not only in the opposing doctrines for the conduct of the integrated battle but also with respect to the preparation for the battle, nuclear release and support to the battle. These asymmetries were judged to favor the Soviets in varying degrees in all scenarios. Of particular note are the advantages the Soviets enjoy in peacetime training, nuclear release procedures, and clear target priorities.

To overcome the effect of the asymmetries heavily favoring the Soviet/Pact, a substantial number of doctrinal requirements and alternatives are proposed (Sections VII and IX). These requirements address the accomplishment of specific tasks during the conduct of and preparation for the integrated battles as follows:

- Localize and neutralize enough Pact nuclear delivery systems so as to measurably degrade the intensity of a nuclear strike. Ideally, a posture of readiness to preempt the strike by conventional means should be sought.
- In absorbing the Pact nuclear strike, the US/NATO corps must seek to preserve the capability to contain the Pact attacking echelons and to interdict succeeding echelons to such a degree that corps forces can,
- Complete the defeat of Pact forces through exploitation operations and, at least, eject them from NATO territory.

Listed below are examples of the more important alternatives presented in Section IX to fulfill the proposed doctrinal requirements.

- A top down conditional nuclear release system

- A central fusion facility at a hardened Army Group command center feeding essential information to command centers within US/NATO corps
- Complete integration of nuclear fire planning into corps operational planning
- Decentralization of target definition and tasking of nuclear delivery means to divisions for targets within range of division weapons
- Initial dispersal of forces in the forward edge of the battle area (FEBA) to reduce vulnerability, then, concentrate deployment as covering forces withdraw and contact becomes imminent
- Deployment of dual capable artillery by gun rather than battery to enhance survivability
- Forward deployment of Lance
- Consideration of an offensive role for atomic demolition munition (ADM); if not feasible, eliminate ADM
- Forward deployment of medical treatment facilities, essential supplies and repair facilities.

As requirements and alternatives were considered, a number of issues arose. Three main issues were evident:

- Target priority
- Type of release
- System mix.

Other issues of lesser importance are noted in Section VIII.

In the consideration of doctrinal alternatives we were cognizant that wherewithal and training sufficiency are both essential to fulfillment. As a consequence some specific recommendations regarding developmental and training requirements are made in subsections 7-2.2.1, 7-2.2.3, 7-3.3.4, 7-3.3.6, 7-3.3.7 and 7-3.3.8 of the main report. The most important of these state requirements for:

- Reduction of U.S./NATO peacetime vulnerabilities,
- Wartime protection of troops, combat equipment and field installations,
- Target acquisition improvements,
- Training systems for command post and field training exercises,
- Establishment of a doctrinal development program which embodies both field testing and quantitative analysis of alternative doctrinal concepts.

With respect to the latter requirement we have prescribed a quantitative method of approach (MOA) to examine some of the doctrinal alternatives presented in Section IX of this report. This MOA is presented in Section XI and involves five areas of investigation which are:

- Survival, control, and support of U.S./NATO corps forces
- Deployment and employment of selected U.S./NATO corps and Division level tactical nuclear means
- Employment of tactical air (TACAIR) in support of U.S./NATO corps forces
- Employment and support of U.S./NATO corps maneuver forces
- Tactical nuclear systems mix required by or to support the U.S./NATO corps

PREFACE

The authors were benefited by the professional interest and competent review of their work as it progressed from a number of individuals and agencies. Of particular value were the ideas and comments received from the Department of Tactics, U.S. Army Command and General Staff College and from the Commanders and key staff officers of Headquarters, USAREUR, V and VII U.S. Corps, 3rd Infantry Division (Mech), 2nd Corps Support Command and 3rd Infantry Division Artillery.

We are especially appreciative of the thoughtful and incisive comments provided to us by Lt.Gen. Arthur S. Collins, U.S. Army, Retired, and the enthusiastic support and participation from Lt.Col. Frank X. Reller III, representing the study sponsor.

The cheerful, willing and professional help provided by Mr. Lyndall Frizzell, Ms. Gwen Fisher, Ms. Donna Michael and Ms. Gale Musgrove in preparing and editing the manuscript are gratefully acknowledged.

Responsibility for the contents of this report, of course, rests solely with the authors.

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SECTION I

INTRODUCTION

1-1 PURPOSE.

The purpose of this study is to analyze the tactical nuclear warfare doctrinal concepts of U.S./NATO and Soviet/Pact in order to determine strengths and weaknesses, judge the effects of asymmetries and develop alternatives which might be pursued to improve the readiness of the U.S./NATO corps for the conduct of tactical nuclear warfare on the integrated battlefield in a European combat environment.

1-2 BACKGROUND.

In the early 1950s NATO accepted the deployment of U.S. tactical nuclear weapons to balance what was perceived to be an overwhelming Pact conventional threat to Western Europe. While the potentially great destructive effect of these weapons was recognized, their presence as a deterrent seemed preferable to building and maintaining a matching conventional force. As long as the U.S. had strategic superiority and NATO had a monopoly on tactical nuclear weapons, plans for their use considered no broad doctrinal implications beyond what was necessary to acquire appropriate targets, supply reliable nuclear projectiles and launch or fire them as accurately as possible within reasonable time constraints. In fact, so little was revealed to NATO commanders (and even to U.S. troop commanders) about the capabilities, limitations and planned employment of these weapons that planning and training at the tactical level ignored the problems implicit in the use of these weapons. Subsequently, planning to take advantage of the potential of tactical nuclear weapons was seriously inhibited.

The counter deployment of tactical nuclear capable launchers and aircraft by the Soviet Union in the late 1950s, along with the publication of doctrinal statements defining their integrated role in Soviet concepts of operational art, caused considerable concern in U.S. and NATO military and political circles. A new dimension had been added on the NATO side. Not only

must NATO forces be prepared to employ tactical nuclear weapons but, now, they had to develop a doctrine for surviving hostile nuclear strikes and conducting two-sided tactical nuclear combat operations. Concern led to studies and some testing of ways to cope with this new threat. Proposed solutions to this problem, some involving basic force structure changes (such as proposed in the "Oregon Trail" study), were so radical that they had little prospect of serious consideration. While it was generally agreed that the logical approach to reasonable survivability lay in dispersion of troops and support facilities, decentralization of command and control, and redundancy of communications and command centers, these and other measures appeared to curtail conventional capability to such an extent that these force structure changes had little chance of being adopted.

To ease the doctrinal dilemma, an assumption was made that warning of the use of tactical nuclear weapons would be received in time to provide a transition period during which NATO forces could assume a "nuclear" posture which would increase their survivability and prospect of being able to continue fighting effectively. Soviet doctrine provides for no such transition, and the notion that there will be such a period is highly suspect. This assumption, however, allowed planners to separate, artificially, conventional warfare from tactical nuclear warfare and place the latter on a very low backburner. Moreover, the requirements of the Vietnam War so preoccupied U.S. planners and doctrine makers during the late 1960s and early 1970s that a hiatus developed in planning for tactical nuclear warfare in Europe. This long period of inactivity led to wishful thinking about the feasibility of being able to increase the readiness of NATO corps to cope with the realities of the tactical nuclear battlefield (TNB). Naturally, since only sketchy doctrine was available for guidance there was little rigid examination of how one would fight and support the forces on the TNB. William R. Van Cleave and S.T. Cohen characterized American and Allied forces as being "ill-prepared and fundamentally untrained for nuclear combat. Serious training of the U.S. forces for a nuclear conflict environment ranges from no

less than comical to non-existent."¹/_{*} Painful as this appraisal may be to accept, it is pretty close to the mark in describing the situation in the two corps of U.S. Army, Europe, as well as in their NATO sister corps.

The deterrent rationale stemming from the early 1950s has also had a constant influence. Most politicians and some in the military apparently still believe that the presence of tactical nuclear weapons, along with the demonstrated ability to acquire targets and accurately launch reliable projectiles (even in the absence of a viable doctrine for fighting on the integrated battlefield) will continue to convince the USSR that it cannot make a successful attack on Western Europe.

Authoritative Soviet pronouncements and published doctrine in no way justify the lack of need for a complete and balanced NATO nuclear war-fighting doctrine, and a training program to prepare the forces for its execution. Ever since first providing tactical nuclear systems to forward deployed Pact forces the Soviets have shown a consistent attitude toward integration of these systems in battle plans. Given the appropriate political stimulus there is every indication that they are prepared to employ their nuclear weapons in a massive strike enabling conventional forces to move swiftly and decisively on objectives deep in the NATO rear, destroying NATO's tactical nuclear capability on the way. The USSR has not disclosed precise force correlations which would cause the initiation of this strike. It is clear, however, that they would at least try to preempt an imminent NATO first strike and retaliate if preemption failed. Given the Soviet obsession with adhering to strict timetables during offensive operations, a nuclear strike can be expected either at the outset of an attack or after an initial conventional assault to assure the momentum required by the plan. It is realistic to conceive that a major confrontation between NATO and the Pact will inevitably lead to tactical nuclear warfare, unless an opportune political solution were to somehow intervene. But, is it prudent to count upon the probability of such a political accommodation coming at the right time to forestall the resort to tactical nuclear weapons by one or both sides? Nothing in past or present

*See "LIST OF REFERENCES", Pg 173.

Soviet actions justifies counting on such a reprieve. On the contrary, Soviet actions clearly point to an urgent need for the U.S. and NATO to develop a much improved conventional capability along with realistic doctrine and tactics for the integrated battlefield.

On the positive side, U.S. programs to improve the accuracy and reliability of weapons, target acquisition and timeliness of launch are underway and will improve the capability of the US/NATO corps to more effectively utilize weapons at their disposal. Progress in this area, however, has not been matched by progress in developing a capability to sustain corps combat, combat support, and combat service support operations on the integrated battlefield. However awesome the Soviet threat appears, there are certainly measures which can be doctrinally prescribed to increase expectation of the survival of the capability to continue the essential combat functions of the corps. Any notion, however, of having the luxury of a period of transition (during which a nuclear posture can be assumed) must be discarded. Doctrinal measures considered must be compatible with the realities of the integrated battlefield which assumes the complementary use of nuclear, chemical and conventional weaponry.

The nature of the Soviet nuclear arsenal and the command and control structure for its employment suggests its greater suitability for attacking forces and installations to the rear of the NATO forward edge of the battle area (FEBA) rather than forward deployed forces in the area of contact. "Soviet nuclear weapons are not, in general, viewed as nuclear fire support. Their inherent nature is regarded as different and, hence, the role they perform is different from artillery."^{2/} This statement along with the stress that Soviet operational art places on massing of conventional forces and in preparation for an attack further supports a conclusion that the Soviets intend to pursue the FEBA battle conventionally.

In a critical assessment of U.S. doctrine and plans for use of tactical nuclear weapons in Europe Jeffrey Record said; "An alternative to the present U.S. tactical posture in Europe, a posture now ill-suited for credible deterrence or defense, is clearly in order... Moreover, the doctrine

governing the use of TNW in Europe is incongruent with the character of the weapons themselves."^{3/}

In this report, opposing U.S./NATO and Soviet/Warsaw Pact doctrines for the conduct of tactical nuclear warfare (TNW) on an integrated battlefield are compared, identifying their strengths and weaknesses and the major asymmetries between them. Within the context of several likely scenarios U.S./NATO doctrinal and training requirements to conduct TNW are developed, and the major issues which ensue from these requirements and existing asymmetries are identified. Possible means of resolving the issues are discussed, and a methodology for evaluating relevant alternative doctrinal choices is presented. It is hoped that this report will assist military planners and operators in attacking the voids that have led to the criticism of U.S. tactical nuclear doctrine in the past.

SECTION II

U.S./NATO TACTICAL NUCLEAR WARFARE DOCTRINE

2-1 BACKGROUND.

2-1.1 Definition.

Military doctrine is defined here as authoritative and valid guidance on the conduct of military operations. Full understanding of a particular doctrine is gained from extending its underlying principles to specific descriptions of the tactics, techniques and procedures which are to be followed in fulfilling the doctrine. Thus, in its most complete form doctrine provides a detailed understanding of how the forces involved will prepare and train for fighting specific tactical operations to include the planning, controlling and supporting of these operations.

2-1.2 Assessment of Doctrine.

Ideally then, an assessment of U.S./NATO tactical nuclear warfare (TNW) doctrine should be undertaken through an evaluation of the pertinent tactics, techniques and procedures as they would likely bear on the accomplishment of military objectives against Soviet/Pact forces in a European conflict. However, such is not wholly possible due to the marked effect that political and strategic factors have had on the evolution of TNW doctrine within NATO. Early in the Kennedy Presidency, the United States shifted from a strategy of massive retaliation to one called flexible response. Acceptance of this strategy by NATO members followed, resulting in NATO MC 14/3, Overall Strategic Concept for the Defense of the NATO Area.^{4/} Under flexible response the role assigned to tactical nuclear weapons is somewhat involved. First, deterrence, as opposed to warfighting capability in Europe is prime. The underlying thought is that the presence of theater nuclear weapons will:

- Deter Soviet/Pact forces from a purely conventional attack on NATO forces knowing that military defeat would ensue, and
- Deter Soviet/Pact forces from a conventional/nuclear attack on NATO forces due to the high risk of escalation of strategic nuclear warfare, a conflict in which both sides would lose.

But what if deterrence fails? MC 14/3 states that NATO may:

- First, selectively employ tactical nuclear weapons in direct defense to defeat either a Soviet/Pact conventional or integrated (conventional/nuclear) attack,
- Second, turn to deliberate escalation if needed to show the attackers that they miscalculated NATO's capability and resolve, and that it is in their best interest to cease the attack and withdraw, and
- Third, respond appropriately to any Soviet/Pact nuclear escalation.

MC 14/3 further states that initial U.S./NATO employments of tactical nuclear weapons are to:

- Be militarily effective,
- Have sufficient shock and decisiveness, and
- (Inconsistently)* be recognizable as deliberately constrained selective use.

While it is not the purpose of this paper to examine this concept from political or strategic perspectives, it is nonetheless essential to recognize its existence and the governing effect it has on U.S./NATO TNW doctrine.

*Added by the authors of this report to point out this inconsistency contained in MC 14/3.

2-2 ORGANIZATION FOR TACTICAL NUCLEAR WARFARE.

2-2.1 Overall Mix.

The mix of U.S./NATO theater nuclear weapons is manifold and includes some U.S. and United Kingdom strategic weapons which are allocated to SACEUR and the French nuclear weapon systems which are not responsive to SACEUR control. Because the focus of this study is on operations at corps, this discussion will deal with three organizational groupings listed below:

- Theater nuclear organization, responsive to theater, major and primary subordinate commands, (MSC and PSC),
- Tactical nuclear organization, responsive to the corps and below, and
- French nuclear organization, responsive solely to French command.

2-2.2 Theater Nuclear Forces.

SACEUR's theater nuclear forces consist primarily of Pershing missile battalions, Polaris A-3 squadrons and nuclear capable strike aircraft squadrons (F-104, F-4, FB-111, Buccaneer and A-7E). Strategic systems likely to support NATO theater nuclear operations include a portion of U.S. Poseidon, four U.K. Polaris submarines and six U.K. Vulcan B2 squadrons. From the Pershing battalions and strike aircraft squadrons comes the Supreme Allied Commander Europe (SACEUR) Quick Reaction Alert (QRA) force, prepared for prompt employment against Soviet/Pact high priority, time sensitive targets. In the near term, the composition and capability of these forces will change with the deployment of Pershing II and ground launched cruise missile (GLCM).

2-2.3 Tactical Nuclear Forces.

NATO's tactical nuclear forces consist primarily of Lance missile battalions, 155 mm and 8" howitzer battalions, and atomic demolition munitions (ADM). The field artillery units of the U.S. (155 mm, 8" and Lance) and the U.K. (8" and Lance) are dual-capable, though not all howitzer units are

nuclear-certified. The dual capability of these mobile systems certainly complicates the Soviet/Pact targeting problem with respect to U.S./NATO nuclear capable systems. On the other hand it raises questions as to its effects on the training proficiency and survivability of a good part of NATO's tactical nuclear forces. The pros and cons of dual capability suggest that the operational tradeoffs involved deserve a careful detailed examination, e.g., does the return in effectiveness from conventional Lance outweigh the decremental effect on Lance survivability? ADM are manually placed by specially trained corps ADM companies subsequent to hostilities and some form of nuclear release. Detonation occurs by timer or on command. They can be used to destroy bridges, cave in natural defiles, cut roads, etc. Thus, their intended purpose is to slow enemy movement or induce concentration of his forces. The potential here is to produce lucrative targets for attack by conventional or nuclear forces and to buy time for conventional reinforcements to arrive within the theater.

2-2.4 French Nuclear Forces.

French nuclear capability consists of strike aircraft and the missile Pluton. Tactical aircraft squadrons contain land based Mirage III-E and aguar fighters, capable of deep (700-1650 km) interdiction and carrier based Etendard. Regiments of Pluton missiles provide each French corps with thirty-six nuclear missile launchers.

2-3 OPERATIONS, COMMAND, AND CONTROL.

2-3.1 Written Doctrine.

U.S. TNW doctrine is contained principally in FMs 3-1, 6-20, 21-40, 71-100, 100-5 and 101-31-1. In some areas a substantial amount of information is provided. These areas include:

- Target damage analysis as part of selective employment planning
- Collateral damage preclusion criteria and analysis

- Troop safety criteria and analysis with respect to friendly nuclear strikes
- Nuclear release procedures.

Much less definition is provided in other areas which are of doctrinal consequence. These include:

- Disposition, maneuver and task organization of forces in both defense and offense
- Target acquisition for selective employment operations
- Protection of troops and equipment from the effects of hostile nuclear weapon employment
- Mass casualty evacuation and treatment
- Reconstitution of units and/or replacement of personnel and equipment
- Provision of other essential combat service support on the integrated battlefield. This section will summarize briefly those elements of current doctrine which are reasonably defined. Subsequent sections will examine the choices seemingly available to cope with the less well defined doctrinal needs.

2-3.2 Corps and Division Planning Processes.5,6/

The general process at the corps level for tactical nuclear weapons employment proceeds from analysis of the threat through the development of likely scenarios (contingency definitions), concept of operations and selective employment packages (SEP). The corps will specify the troop safety

criteria, collateral damage constraints, target priorities, allocation of weapons to divisions and conditions to request release. At the division level a subpackage is planned for each scenario (contingency). The division commander adds to the corps guidance as follows:

- Constraints concerning refugees
- Level of assurance for precluding collateral damage
- Concept of operation of each contingency.

A preclusion overlay of the division sector is prepared by the G-5 to aid in planning collateral damage avoidance. For each contingency the G-2 prepares a detailed threat array (company level) predicting enemy deployments for the time a land battle SEP is employed. Using the preclusion overlay, with radii of collateral damage added, and the threat arrays the planners in the division fire support element (FSE) select aim points and weapon sizes building a subpackage for each contingency. As indicated previously, written doctrine deals in some detail with target damage, collateral damage and troop safety analysis. But only scant mention is made of the relationship between tactical nuclear fires and maneuver force objectives. On receipt of plans from the divisions, corps will add aimpoints to:

- Attack enemy forces at greater depth on the battlefield
- Fill in gaps covered by corps targeting resources
- Attack targets directed by the army group and theater commanders.

These are then resolved into the fewest number of distinctly different SEPs to support all the corps contingencies. In some cases a single SEP will suffice.

2-3.3 Warning.

Prior to employment, corps is responsible to insure that all adjacent

and subordinate units are notified of the time span for the SEP and are warned of imminent nuclear detonations that might effect them. Warnings are preferred by secure voice means in accordance with FM 101-31-1 and STANAG 2104. Provisions are made for codeword warnings under the strict guidelines that they are specified in Communications Electronic Operation Instructions (CEOI), indistinguishable from all other routine traffic, changed frequently and memorized daily like passwords.

2-3.4 Release.

Release is a complex, detailed subject. The sole source is the National Command Authority (NCA). From the unclassified reference, RB 71-102, it is shown that ideally release should be requested about twenty-five hours prior to the anticipated need for employment.^{7/} While the request/release system makes use of a skip echelon technique for request and higher level release, it is important to note the procedures include only two hours for consultation between the NCA and the NATO Military Committee and that release from army group downward is not skip echelon. From SACEUR there are nine different types of messages associated with release either warning the NCA and NATO Military Committee of specific future requests or granting some form of specific release to include modification and withdrawal. All release messages are subject to the conditions of double authentication and error-free receipt. Employment command and control is also tightly disciplined. As mentioned previously all releases are subject to modification or full curtailment. At the tactical level the lowest releasing command level is corps and the lowest executing command level is division.

2-3.5 Corps and Division Operations.

The foregoing doctrinal summaries on the planning processes at corps and division, warning and release leave one with an empty feeling regarding the doctrinal principles which should govern the employment of organic and external combat and combat support forces in tactical nuclear and chemical warfare environments. Reference to current instructional material from the Command and General Staff College reinforces this feeling of emptiness. In

the introduction to the chapter^{8/} on nuclear and chemical operations for brigade and division forces the following telling statement is made. "The basic principles espoused in FM 100-5, Operations, do not change with the introduction of nuclear and chemical weapons. Such weapons should be regarded as augmentations to normal divisional combat power whether they are used to directly destroy enemy forces, to deny an area to enemy movement, or to demonstrate national resolve. . . . employment planning is the substance of the remainder of this chapter." What follows are lengthy discourses on nuclear and chemical fire planning, largely independent of the roles to be fulfilled and missions to be executed by all the remaining combat and combat support forces.

In Sections VII and IX we will deal with the doctrinal requirements and alternatives. The development of these requirements and alternatives will ensue from our perception that the foregoing statements on unchanged principles and combat power augmentation are assertions which a logical consideration of the driving factors involved will not support. Our belief of insupportability stems from the following considerations. The opposing forces consist of substantial tank and mechanized infantry maneuver battalions, conventional artillery battalions, air defense units, attack helicopter units, airmobile units, combat engineer units, reconnaissance and security forces, and tactical air forces. Additionally, these combat and combat support elements are further enhanced in their combat capabilities through organic and external intelligence, target acquisition, electronic warfare and C³ means. The effectiveness of these substantial heterogeneous forces will be dependent on their ability to survive, maintain effective control and support operations in order to bring their inherent combat capabilities to bear on the opposing forces. The employment of tactical nuclear and chemical weaponry in battles involving these forces will have manifold effects on the essentials regarding survivability, command and control, and combat service support. While some passive measures can and should be taken to enhance survivability and control, it is clear that such measures alone will not suffice to sustain the combat capability of these forces in tactical nuclear and chemical combat environments. Active measures need to be determined not only to sustain, but also to exploit the combat power of all the forces

involved. In Section VII we will present the pertinent doctrinal requirements as we perceive them. From these, passive and active measures can be determined which will:

- Enhance the survivability of maneuver forces and exploit their capabilities in both defensive and offensive operations
- Sustain the effective employment of both conventional and tactical nuclear field artillery units
- Sustain and exploit the capabilities of Army aviation units to attack enemy maneuver forces, support airmobile operations, augment command and control, provide reconnaissance and surveillance of the battlefield and effect resupply including nuclear warheads
- Enhance and sustain the effective employment of target acquisition and intelligence capabilities particularly against Warsaw Pact Frontal nuclear and chemical means
- Maintain effective command and control, and support of forces in a more hostile battlefield environment under the changed and more stringent doctrinal requirements which we anticipate
- Provide an integrated and more effective employment of combat support from assets external to the corps.

The foregoing general statement of doctrinal requirements has led us to the preliminary conclusion that the employment of tactical nuclear weapons will alter the nature of battles to such a marked degree that substantial changes to existing doctrine are imperative to the conduct of effective combat operations. To regard such a destructive force as simply an augmentation to normal division combat power is to ignore the inherent potential to employ such combat power decisively in an integrated fashion with other combat means. Clearly, the decisive nature of tactical nuclear weapons offers a

two-edged sword as will be further emphasized in Section III on Soviet doctrine. Both adversaries are potential losers; only one adversary is a potential winner.

2-4 TRAINING.

The extant doctrinal emphasis on selective employment planning and the attendant factors regarding collateral damage, release procedures and troop safety carry over into the training of U.S./NATO forces. The areas treated in the greater detail have to do with the planning of tactical nuclear fires. At the C&GSC today, TNW instruction is contained in a thirty-odd hour elective with an emphasis on SEP planning. Compare this with the 600 hours of instruction at the C&GSC in the mid-fifties as cited by Van Cleave and Cohen.^{9/} Field training exercises such as Sage Brush and Frontier Shield are memories from the past. Troops in the field today are seldom exercised in prolonged simulated TNW environments. Thus, the manifold demands which TNW operations will inevitably have on the command and control of maneuver forces; communications; the protection of troops, equipment and field installations; mass casualty evacuation and treatment; other combat service support; unit reconstitution and individual soldier performance are generally not matters of concern and emphasis in field training exercises. Here we observe a stark comparison with the training of Soviet/Pact forces as cited in Section III, which follows.

2-5 STRENGTHS AND WEAKNESSES.

U.S./NATO forces possess a substantial theater nuclear arsenal. With due consideration to dominant political factors, the procedures for request/release and the SEP planning processes are viable concepts, within themselves. It is less clear how these concepts complement U.S./NATO conventional forces toward the achievement of the military objective to fight and win in Europe on the integrated battlefield. A number of weaknesses merit detailed examination in developing doctrinal requirements and alternatives for U.S./NATO forces.

- Warning and Stationing. In their casernes and air bases U.S./NATO forces are highly vulnerable to a Soviet/Pact preemptive attack. This is particularly true of most nuclear delivery means and storage sites. NATO's TNW force will be substantially different from the one planned if warning assumptions do not hold, and Soviet/Pact forces initiate hostilities with a preemptive nuclear strike coupled with a standing start conventional attack.
- Dual Capable Field Artillery. Collateral damage and troop safety criteria, target acquisition capabilities, system survivability and training requirements are factors which bear on the efficacy of these systems. Due to their conventional fire missions, their likely decrease in survivability and the increase in training demands may prove to be weaknesses of the nuclear capable cannon systems. In a different vein the conventional capability afforded Lance may in fact be working against its survivability as a TNW delivery system.
- ADM Effectiveness. When taken within the context of likely European scenarios, the planned options for ADM employment appear to be extremely weak. The execution of planned ADM targets is very time-sensitive. As a result, given the uncertainties of the time of nuclear release, the executing commanders cannot place much reliance on being able to use ADM at the time and locations they might need them most. Even without this constraint, the problems of chambering the ADM deep enough to minimize fallout or coping with extensive fallout when the ADM is shallowly chambered are severe.
- Target Acquisition. Written doctrine states that precise aimpoints are to be refined by the executing command just prior to employment.^{10/} While this doctrinal precept is unquestionably sound, existing and programmed target acquisition means will not provide the capability to do this well except for strike aircraft.

- Disposition, Maneuver and Task Organization of Forces. Under current written doctrine, the driving factor here is troop safety.^{11,12/} For U.S./NATO maneuver forces to exploit the effects from tactical nuclear fires detailed definitions prescribing active and passive means of increasing survivability and the employment and task organization of the forces involved are essential for both defensive and offensive operations.
- C³ Survivability and Control of Maneuver Forces. The expected situation of the tactical nuclear battlefield is that C³ will be severely vulnerable to destruction and disruption. The means of controlling conventional maneuver forces under the chaotic conditions likely to ensue do not exist today. Without such means, the conduct of effective combat operations on the integrated battlefield will be most difficult, if not impossible because release authority, troop warning, and coordination of nuclear strikes are dependent on reliable communications. Overcoming this weakness through a combination increased communication equipment survivability, C³ redundancy and training is a doctrinal imperative.
- Troop Protection. The obvious troop protection weaknesses of U.S./NATO forces today, suggest that major improvements are needed in combat equipment and troop training as well as a doctrinal approach to the degree of dispersion in new and different situations.
- Combat Service Support (CSS) Requirements. While current doctrine is replete with CSS procedures for conventional conflict, there exists a comparable dearth of doctrine for the integrated battlefield. This appears to be a severe weakness within U.S./NATO forces, particularly with respect to casualty evacuation and treatment, personnel and/or unit replacement, and resupply operations. Detailed discussion of combat service support doctrine is presented in Section IV of this report.

- Handling of Refugees. In Europe, this is likely to be a very severe problem in any type of conflict, the West German plans for the population to remain in place notwithstanding. On the TNW battlefield, this could become a major burden to U.S./NATO forces, with respect to deployment, movement, Soviet/Pact intelligence gathering and caring for the refugees themselves.
- Training. Today U.S./NATO forces are not adequately trained for operations on the TNW battlefield. Particular shortcomings have been stated previously in this paragraph and the marked differences in training emphasis between U.S./NATO and Soviet/Pact forces were pointed to in paragraph 2-4. The differences here may well be the major asymmetry between the opposing forces.

SECTION III

SOVIET THEATER NUCLEAR WARFARE DOCTRINE

3-1 PREFACE.

In attempting to outline the key elements of the threat inherent in Soviet nuclear warfare doctrine there is a temptation to visualize how a senior Soviet military officer would express himself on this subject - the inside rather than the outside view.

Let us imagine that Army General (four star) Yakushin, Chief of Staff of the Soviet Ground Forces, has consented to conduct a symposium for a group of NATO corps commanders on Soviet doctrine for the use of nuclear weapons in a war between the Warsaw Pact and NATO. Aware of the interests of his audience he limits his discussion to matters most germane to these interests.

General Yakushin is a real person. He was born in the Ukraine in 1924. During the Great Patriotic War, 1941-1945, he was first a teenage partisan, then a soldier. In 1944 and 1945 he took his tank through numerous battles from Kiev to Prague and was commissioned at the end of the war. He is not an intellectual, but a shrewd fighter and leader. He scorns bourgeois manners, prefers eating with a knife rather than a fork. For all that, he is eager to discuss military matters with American counterparts and to air his views at length. Although he adheres to the party line, he is not nearly as inhibited as his Soviet colleagues in raising or responding to controversial issues.

When one of the authors* was Chief of Staff, U.S. Army, Europe, during 1973 and 1974, he had numerous conversations with General Yakushin, then Chief of Staff, Group of Soviet Forces Germany. On one occasion, they spent a day together observing a Soviet motorized rifle regiment in training and visiting barracks and mess halls. The ostensible purpose of these meetings was to discuss problems arising from the activities of the U.S. Military Liaison Mission in East Germany and the Soviet Military Liaison

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Mission in the former U.S. Zone of West Germany. But, a whole range of subjects were discussed, both political and military. The conduct of theater nuclear warfare was not broached, but the matter of timing and schedules as a paramount precept of Soviet military doctrine arose many times. General Yakushin, in observing training exercises, seemed preoccupied more with the time schedule of events being met than whether the maneuver was executed properly. For example, we saw an artillery battery occupy a hasty position and begin firing without checking the guns. Had it paused to make sure the tubes were parallel the concentration it was firing would have been late.

3-2 GENERAL YAKUSHIN'S DISCOURSE.

An exposition of Soviet theater nuclear warfare doctrine as General Yakushin might have expressed it:

Gentlemen Commanders:

You have asked me to describe the Soviet doctrine for tactical nuclear warfare. We do not use the word doctrine in exactly the same sense as you do. I believe what interests you is the role that our "operational art" prescribes for theater nuclear warfare.^{13/}

Operational art concerns itself with the preparation for and the conduct of operations at the Front and army levels. I will, therefore, discuss force organization, operations and training in the context of nuclear weapons employment at these levels.

General.

To better understand our operational art, some background on our attitudes toward the employment of nuclear weapons is necessary. First, we do not use the term, "theater nuclear weapons." What you call battlefield and mid-range theater nuclear weapons we call operational-tactical weapons. Similarly, our operational-strategic

weapons correspond to your long range theater weapons. These operational-tactical weapons, backed up by the operational-strategic weapons, form a basic part of our theater warfighting capabilities. Their use can contribute significantly to the achievement of five important principles of operational art:

- Mobility and high tempo of combat operations
- Concentration of efforts
- Surprise and security
- Combat activeness
- Preservation of the combat effectiveness of friendly forces.

To realize these principles and thus be successful in war, we believe that we must be able to blend our *nuclear, conventional and chemical* capabilities on the battlefield according to the requirements of the situation. You should not be misled that the substantial improvements we have made to our conventional forces means reduced emphasis on our nuclear capability, or that highlighting our defensive preparedness against chemical weapons means that we are not well prepared to use chemical weapons offensively.

I cannot foresee, of course, exactly how our political masters, who must approve the use of nuclear weapons, will view events in wartime but you must certainly be aware of the great advantages perceived by our authoritative military writers in our being the first to conduct a nuclear strike. When we are sure that the enemy is preparing to strike our forces first, we will make every attempt to preempt. When preemption is not possible, we will, of course retaliate. We believe that initial, preemptive and retaliatory strikes should be massive and comprehensive throughout the entire depth of the enemy deployment to:

- Destroy nuclear delivery means
- Destroy main groupings of combat forces and their command and control
- Isolate the battlefield
- Breach the main defense line and define main attack corridors.

In attacking nuclear delivery means the timely destruction of the target is paramount. That is to say, we will use the weapon which gives the highest assurance of destruction in the time available.

Organization for Theater Nuclear Warfare.

Our basic organizational concept is that our operational-tactical, as well as operational-strategic, nuclear delivery units are independent formations. They are not part of the artillery and are not considered to have the same support role as artillery. Structurally, FROG, SCUD and SCALEBOARD battalions are located at division, army and Front level respectively, but their operational control is handled separately from other fire support means and through dedicated channels of communication. We see distinct advantages in this arrangement. First, it makes the operational-tactical units more responsive to the requirements of the strike plan. Second, it permits these units to deploy in a fashion most compatible with their survival and, third, it fosters an elitism and dedication to purpose so important to achieving excellence in the complicated techniques of employment associated with nuclear delivery.

You are no doubt aware that we have independent heavy artillery brigades containing 203 mm howitzers and 240 mm mortars. I am not prepared to comment on their nuclear capability. I will say that over the years in the development of our nuclear forces we came to

the conclusion early that it was an inefficient use of our limited fissionable materials to develop and produce a nuclear artillery shell.^{14/}

In addition to the rockets and missiles of our operational-tactical nuclear forces, we rely heavily on aviation to carry out portions of our nuclear strike plans. Air support of our ground forces comes mainly from the tactical air armies under the operational control of the Front commanders. Frontal aviation may be reinforced as necessary from the Long Range Aviation under the operational control of the TVD (Theater of Military Operations) commander. In a tactical air army you find fighter, bomber, reconnaissance and helicopter regiments. All of these formations have a role to play in tactical nuclear warfare, as I will describe later. It should now be clear to you the important role played by the Front commander who, in both peace and war, has direct control of all operational-tactical forces which will execute his nuclear strike plans.

Operations.

Let us assume for this part of my discussion a scenario in which forces of the imperialist NATO countries have attacked Warsaw Pact forces in the German Democratic Republic. The Commander of the Group of Soviet Forces Germany, has become the Central Front Commander. His mission is to halt the NATO attack and to launch an offensive as soon as possible to destroy NATO forces on the continent of Europe and prevent the introduction of reinforcement from the United Kingdom and the United States. He is told to update his nuclear strike and chemical warfare plans on the assumption that he will be authorized to use nuclear and chemical weapons to meet the rigid time lines of the offensive. The Front Commander realizes that he is faced with two urgent tasks which must be accomplished before an offensive can be launched. Since NATO forces are deployed he must launch a coordinated target acquisition effort. Concurrently, he must expedite the forward movement of his echeloned forces to where they will be in position to exploit nuclear and chemical strikes and the initial successes of his forward echelon forces.

The acquisition effort will be tailored to locate nuclear delivery means and associated weapons storage sites, command posts, communication centers, and troop formations in reserve. Pending release of nuclear weapons, these targets will be attacked by conventional means. The Front commander has substantial target acquisition resources which can operate around the clock and in all weather. He can put multiple resources on important targets. In his tactical air army there are the means for:

- Aerial reconnaissance (visual, photo, IR, radar and SIGINT). Pairs of reconnaissance aircraft might be used to locate and destroy nuclear delivery means.
- Inserting long-range reconnaissance patrols by helicopter or transport aircraft.

In his armies and divisions there are ample means for:

- Electronic interception (ground radar, VHF, HF)
- Electronic direction finding
- Conduct of raids and patrols to obtain prisoners and documents
- Radar, sound and flash ranging.

He can also expect to receive target information from agents who can operate quite freely within the open societies of the NATO countries.

As the target acquisition effort proceeds, the Front commander and his staff are able to refine their nuclear and chemical strike plans. Nuclear and chemical targets are assigned to the FROG, SCUD and SCALEBOARD battalions and to the fighter bomber regiments of the tactical air army. Generally, the air will be given the mobile targets while the rockets and missiles take the fixed targets. Chemical targets might include supply installations deep in the rear and masses of troop reserves.

The Front commander will attempt to achieve maximum surprise with his nuclear strike. He will not warn his own troops but rather assure troop safety by giving his attacking echelons appropriate arrival times at lines of departure. He may well schedule his nuclear strike to coincide with the start of his conventional preparatory fires.

After initial massive nuclear and/or chemical strikes, the Front commander will expect his armies to move rapidly through the attack corridors which his strikes have defined. Follow-up echelons will move closely on the heels of the attacking echelons continuing the momentum of the offensive by attacking from march formations through or around the forward echelons. One or more airborne divisions may be inserted on deep targets, perhaps on the far banks of planned river crossing sites, for example. The situation becomes fluid as our troops move forward day and night to meet those all important time lines. While we will spread out our formations somewhat in recognition of the enemy nuclear threat, that risk is subordinate to meeting the battle plan schedule.

You have noted that I have not mentioned follow-on nuclear strikes in the corps area. They are not absolutely precluded, particularly if necessary to preserve the schedule, but are unlikely for two reasons:

- The fluidity of the battlefield and intermingling of opposing forces make targeting difficult.
- The initial strike, being deep and comprehensive should give us a correlation of forces (force ratio) so favorable that further nuclear intervention is unnecessary.

Command and Control.

In discussing organization I noted the independent nature of our operational-tactical and operational-strategic nuclear delivery means. Along with dedicated communications, this alleviates but does

not completely overcome our command and control problems. These problems not only encompass the timing and direction of the initial nuclear or chemical strike but also, the timing, routes, and objectives for the conventional forces as they exploit this strike. To assist our commanders, we have developed computer systems to better handle all the data required to properly execute battle plans. Computers are used to direct the nuclear strikes over dedicated communication channels.

We require that commanders of all echelons be thoroughly conversant with the battle plan and its timing so that if communications are disrupted the plan will be properly executed. We recognize that this concept may inhibit a commander's initiative in reacting to unexpected situations but, on balance, we prefer to keep a tight control over our commanders' actions.

During operations, command and control is exercised at each level through an array of command posts separated so that not more than one can be put out of action with a single medium yield nuclear weapon. At regiment and below only one command/observation post is established and consists of a small number of armored vehicles. Divisions and above usually have four:^{15/}

- A main CP about 5-15 km from the line of contact
- A forward CP near troops of the first echelon
- An alternate CP, 5-15km from the line of contact but offset from the main CP
- A rear services control point about 10-30 km from the line of contact.

We require that CPs make use of cover, concealment and camouflage and offset radio vehicles from the command center. Redundant communication nets link these command posts with each other and with higher, lower and adjacent units.

Training.

Operational art is credible only if the troops who will execute it are thoroughly trained in its techniques. Thus, operational art and training in the Soviet Army are closely linked. Our operational-tactical and operational-strategic nuclear forces constantly practice what they will have to do in executing the types of strikes that I have described. They do this independently and also in combined arms exercises. Training is particularly intense for the forces in the Group of Soviet Forces Germany (GSFG). The troops there in our motorized rifle and tank divisions are equipped for and carry out training exercises in nuclear and chemical environments. Since we rarely permit our soldiers to leave their barracks during their off-duty time in the German Democratic Republic, there are few distractions to a vigorous training program. They spend long periods in large training areas where firing can take place in the context of combined arms exercises. Some of these training areas happen to be well placed with respect to the border between the two Germanys. *They could be used to assemble first echelon divisions prior to an attack under the guise of training,* thus contributing significantly to surprise and deception, important principles of operational art.

I must admit that our troops in the GSFG are not always at the same level of training. Conscripted Soviet soldiers serve a two-year tour in the GSFG and about one-fourth of them rotate each May and November. From this you could conclude that from a training standpoint the GSFG is better prepared to fight at some times of the year than at others. Our officer and non-commissioned officer cadre, however, is more stable, providing the necessary continuity.

Gentlemen Commanders:

This ends my presentation. I leave it to you to draw the appropriate conclusions.

3-3 STRENGTHS AND WEAKNESSES.

General Yakushin's discourse presents a picture of a Soviet Army which has a tactical nuclear doctrine and through exercise of the doctrine in training is well prepared to conduct theater nuclear warfare. Along with other sources, it reveals some strengths and weaknesses which we should ponder in light of our own doctrinal approach.

3-3.1 Strengths.

- A theater nuclear force which is independent and detachable from theater conventional forces
- A developed doctrine for the integration of tactical nuclear weapons into the land battle
- Unity of command at the Front level for the control of both ground and air means for target acquisition and the delivery on targets of tactical nuclear weapons
- Ready availability of Strategic Rocket Troops and Long Range Aviation to intervene in the theater battle
- Highly developed EW capability
- Skip echelon nuclear release procedures
- Availability of unconventional forces to assist in acquisition and destruction of high priority targets
- Availability of airborne forces to assist in exploiting nuclear strikes
- Apparent determination to preempt a NATO nuclear strike judged to be imminent

- Highly developed capability to use and defend against chemical weapons in an integrated battlefield context
- Redundant command, control and communications facilities and systems
- A relatively unstressed C³ system due to detailed battle planning and briefing of commanders at all echelons
- Same chain-of-command for war and peace
- Highly disciplined well-trained troops.

3-3.2 Weaknesses.

- Absence of means, other than air, to deliver accurate nuclear strikes on close-in and mobile targets
- Air target acquisition and delivery means at a risk on bases; enroute to and in the target area
- Operational techniques which induce preattack massing of first echelon troops and the use of detectable routes and assembly areas for following echelons
- Questionable reliability of Pact allies and probability that only Soviet forces will be allowed to deliver nuclear weapons
- Obsession with battle plan schedules and timing permitting little leeway for exercise of command initiatives in unanticipated situations

- Very rigid discipline and troop control which would probably stifle soldier initiative on a fluid battlefield and cause blunders
- A troop replacement system for the GSFG which removes significant numbers of tactical personnel twice a year. (Failure to follow the established replacement routine could be a signal of Soviet intentions.)

SECTION IV

U.S./NATO SOVIET/WARSAW PACT BATTLE SUPPORT DOCTRINE IN A TACTICAL NUCLEAR WARFARE ENVIRONMENT

4-1 U.S./NATO BATTLE SUPPORT.

4-1.1 CSS Support Corps Level.

Several recent changes in doctrine and organization for logistics support have impacted heavily on the corps. The resulting posture is unsatisfactory with the major burden of supply and maintenance support devolving on the Corps Support Command (COSCOM). The concentration of supplies in the corps area has resulted in less mobility in corps combat service support (CSS) units and greater vulnerability to attack. At the same time, detailed management of supply and maintenance operations, almost wholly dependent on automatic data processing (ADP) support, has been centralized in the COSCOM Material Management Center (MMC). The efficiency and economy of the logistic operations in the corps by design were based on past experience and in the rapid development of computer based support systems. These worked well in the stable logistic bases established in Vietnam. They presently work well at CONUS bases and in the garrisons in Europe. They may not function at all in an integrated battlefield environment. New logistics concepts are moving in the direction of reducing the management and operational workloads within the corps, both in terms of overall tonnages of reserve supplies and in numbers of line items stocked. A revised COSCOM organizational structure is being developed by the Army Training and Doctrine Command (TRADOC) in a "Corps 86" study effort. The concept of centralized management supported by automated systems remains, along with a need for alternate data storage and processing sites. The volume of data to be transmitted will remain large. The capability of the revised COSCOM headquarters to manage the CSS effort on the integrated battlefield with attendant disruption to communications, loss of data processing and storage, and need for greater dispersion and mobility to survive, raises a number of serious questions.

4-1.2 CSS at Division Level.

4-1.2.1 General. Combat service support is provided by the Division Support Commands (DISCOM) of the Army divisions. The discussion below follows the DISCOM organization for the armored, infantry and mechanized divisions.^{16/}

4-1.2.2 Casualty Evacuation and Treatment. The medical battalion of the DISCOM provides close medical support to all divisional elements. The battalion is organized with a support company in the division support area and a medical company in each brigade support area. The clearing platoons and ambulance platoons of the medical companies establish clearing stations and evacuate patients from battalion aid stations. During displacement the company establishes a clearing station while closing out the station in the old area. The support company in the division support area (DSA) may establish a clearing station for the DSA, backup or replace a clearing station in a brigade area or provide emergency aid stations for area damage control. Aeromedical evacuation is provided by the COSCOM. Medical treatment in the division is designed to return patients to duty in a short period (2 to 3 days) or prepare them for further evacuation. Evacuation from division is normally by corps transport to hospitals of the COSCOM medical brigade.

4-1.2.3 Resupply and Reconstitution. Current doctrine provides for direct supply delivery from the U.S. to division direct support units (DSU) and COSCOM general support units (GSU) and centers. The new concepts have modified the flow in wartime so that 80% of non-ALOC (air line of communications) items (classes I, II & IV, III pkg, VII and heavy tonnage class IX) will be supplied by COSCOM GSU to the division DSU. For ALOC items (class IX, less heavy items, and selected class II), all authorized stockage list items will be supplied by the COSCOM GSU, non-stockage list from CONUS to the DSU. For class IX 45 days of supply (DOS) will be maintained at the DSU 30 DOS at the GSU, plus an allowance for order and ship time.^{17/} The impact of the new concepts impacts less on DISCOM supply operations than on the COSCOM and the Communications Zone (COMMZ) base. Division supply is managed by the division material management center with supply support provided by the supply and transport (S&T) battalions and maintenance battalion DSU. Stock

control of class I (subsistence) and VI (personnel demand) items is maintained manually and requirements are placed on the (COSCOM) MMC. Distribution is accomplished by unit pickup at the class I forward distribution point established by the supply and service company (S&SCo) of the S&T battalion. For classes II, IV, VI and VII, units submit their requirements to the appropriate supply point of the S&SCo. Supply points are replenished by stocks held by the S&SCo in the division support area (DSA). Requirements for the division are placed on the COSCOM MMC. The S&SCo operates class III distribution points in the DSA and brigade support areas (BSA) for unit pickup. Each supported unit in the division submits a periodic forecast for petroleum, oil and lubricants (POL) to the division materials maintenance center (DMMC) indicating any change from previous supply rates. A consolidated report of division POL requirements is submitted to the COSCOM MMC. Normally, COSCOM transportation provides bulk POL delivery to division class III distribution points in the DSA and BSA, transferring fuel to division tankers. When expedient to do so, under unit distribution, the division may exchange empty for full tankers of the COSCOM supply activity. In the BSA, a combination of supply point and unit distribution is also used. Class V (ammunition) supply support is provided by COSCOM ammunition supply points (ASP). The division ammunition supply officer (ASO) in the DMMC authenticates all requests for ammunition. The ASO may establish a control point to help control the flow of ammunition requests and supplies to and from the ASP which are located in the DSA. The normal basis for the approval of unit requisitions is replenishment of basic loads and controlled supply rate. Distribution is normally by unit pickup at the COSCOM ASP. Medical supplies are handled by the medical battalion on an informal basis of requisitioning within the division. A class VIII distribution point is established at a point readily accessible to ambulances supporting the forward medical units. Class IX is managed by the DMMC under the automated class IX supply system. The class IX supply section of the DMMC continuously monitors repair parts supply operations, noting and advising the division material maintenance officer (DMMO) of problem areas, trends and new developments in the repair parts situation. The maintenance battalion receives and distributes repair parts for the division. Reconstitution is not directly addressed in doctrine for the DISCOM. Responsibilities and means for limiting the effects of an enemy attack on CSS units are set forth under area damage control. How to

organize surviving CSS elements to continue support is not specifically addressed.

4-1.2.4 Maintenance and Decontamination. The maintenance battalion performs most of the direct support (DS) maintenance on division equipment. The battalion normally places a forward support company in support of each brigade in the BSA. The company provides DS maintenance on a repair and return to user basis. Emphasis is in forward support through the use of maintenance support teams to perform repairs on the spot. Whenever possible, the teams make direct exchange of power-packs and assemblies kept available at the forward support companies. The forward support capability can be reinforced by the light and heavy maintenance companies. The forward support companies have a limited recovery and evacuation capability. The missile support company provides missile-peculiar class IX support and maintenance teams to support missile weapons systems of the division. The headquarters and light equipment company and the heavy maintenance company operate the division maintenance collecting point. The forward support companies establish maintenance collection points in the BSAs. The concentration of units in the DSA as normally employed in field exercises invites attack by conventional as well as nuclear and chemical weapons. Decontamination of personnel, equipments and areas is accomplished by teams organized by the DISCOM commander with the assistance of the DISCOM chemical officer, division surgeon, and division engineer.* Radiological surveys are conducted following nuclear attack to determine the extent and degree of contamination. Fall-out predictions are made as a basis for tactical planning. Earthmoving equipment of the engineer battalion is used to assist in the decontamination of areas and to clear entry and exit routes. Detailed procedures for decontamination of personnel and equipment are contained in field and technical manuals.

4-1.2.5 Transportation Service, DISCOM. The employment of vehicles of CSS units is centrally controlled by the DISCOM movement control officer (MCO) under priorities established by the division general staff. Maximum use of vehicles transporting supplies forward is made for retrograde of damaged and captured equipment, salvage and prisoners of war (POW). When movement

*A decontamination company has been added to the DISCOM since publication of FM 54-2. Revised doctrine will be included in the Division 86 study and in FM 54-2 when revised.

requirements exceed division capabilities, the division transportation officer (DTO) requests additional motor transport from the COSCOM. Transportation assets are insufficient to support heavy demands even in a conventional war. In the few exercises of the past when combat units were widely dispersed, locating and resupplying the units overtaxed the capabilities of the division transport elements. Doctrine for supporting the integrated battle is generally lacking.

4-1.2.7 Forward Area Control. With the increase in emphasis on forward support, a DISCOM forward area support coordinator (FASCO) is normally required in the BSA. The FASCO is the coordinator between the brigade executive officer or S-4 and the DISCOM CSS elements operating in the BSA. The FASCO also coordinates local security measures of the DISCOM elements. He maintains radio contact with DISCOM headquarters providing information on the logistical situation in the brigade. The concept has worked well under conventional war conditions. The organization and operation of a BSA postured for support and survival on the integrated battlefield has not been developed or tested.

4-1.2.8 Summary, CSS at DISCOM Level. In general, the DISCOM is organized and trained to provide responsive CSS support to the combat units of the brigades in a conventional warfare environment. Changes over time have been made to increase economy and efficiency through centralized, detailed control of supply and maintenance management. Aside from automated procedures, supply and maintenance workloads have remained essentially unchanged with operations concentrated in the division and brigade support areas. Mobility is limited considering the supplies on hand and competing requirements for transport. Transportation augmentation is required for rapid displacement or conduct of independent missions. Mechanization of the management systems has made detailed supply and maintenance management possible. In some classes of supply, manual procedures for stock control are or can be used. Class IX is another matter. As an integral part of maintenance operations, the question of how much repair can be accomplished within the DISCOM on the integrated battlefield needs to be addressed.

4-1.3 Communications Support.

Current doctrine stresses rapid flow of essential information to and from commanders for control of the battle. Mobility and redundancy in command posts (CP) supported by mobile communications equipment are also emphasized for survival and continuity of command control (C²). Secure communications means down to maneuver battalion level is an established requirement. Stress is placed on multiple means and paths to reduce the effects of enemy jamming. The division signal battalion provides communications support to the division command posts, brigades and DISCOM with necessary land line, microwave, telephone, teletype, mobile radio, multichannel service. The redundancy of multiple paths and frequencies helps reduce the vulnerability to jamming. However, the systems are vulnerable to disruption due to nuclear effects and disruption by electromagnetic pulse (EMP).

4-1.4 Strengths and Weaknesses.

4-1.4.1 Casualty Evacuation and Treatment. Compared to the Soviets the U.S. has more transportation (ground and air assets) dedicated to medical evacuation. Less time and fewer steps in the evacuation chain from the battlefield to a surgical facility are employed. Historically, rapid evacuation of casualties to field hospitals has dramatically reduced fatalities in the U.S. Army in combat. The integrated battle will have a dramatic impact in that normal evacuation procedures cannot be employed until after a mass casualty situation is brought under control. Compared to the Soviets, the U.S. provides a higher level of professional medical skills immediately available to the combat units. Doctors are available to direct and perform life saving treatment at battalion and division clearing stations. The doctrine of forward medical support will continue to be a strength. However better equipment for operating and surviving on the integrated battlefield are required. The most serious weaknesses are in the peacetime readiness posture of the medical service, in training and equipment for the integrated battle. The Assistant Secretary of Defense for Health Affairs has stated that the Medical Department cannot support a major force at this time^{19/}; introduction of nuclear weapons on short notice in Europe would only make matters worse. Aside from a serious shortfall in personnel,

medical units lack training in the treatment of mass casualties on the integrated battlefield. They are ill equipped for entering and performing emergency treatment and evacuation in contaminated areas. Ambulances provide little or no protection for the drivers or patients. The units lack other equipment needed on such missions to sustain around-the-clock operations. Army hospitals are not trained in situations requiring frequent displacement behind the divisions they support. Training is inadequate in siting, taking advantage of natural shelter and cover, construction of hasty shelters to protect wards and quarters areas from blast, radiation, and thermal effects. Present training and organization place heavy reliance on aeromedical evacuation by helicopter. This evacuation means may be an early casualty itself on the integrated battlefield. U.S. personnel in general lack adequate training in avoiding the effects of mass casualty weapons and in rendering mutual and self-help (first aid).

4-1.4.2 Essential Resupply and Reconstitution. The main strength of the U.S. Army doctrine is in the emphasis on forward support of essential supplies for weapons systems: ammunition, POL, and subsistence. The procedures are simple, informal, and effective. Procedures for supporting dispersed, highly mobile combat units on the integrated battlefield, however, need to be developed. The weaknesses in current doctrine, organization and training are readily apparent. Manpower reductions applied to CSS units in Europe have long since exceeded current DA guidance on host nation support.^{20/} During the early phase of a conflict or an alert period, CSS units in Europe must disperse war reserve stocks, issue and deliver supplies to the combat units, receive and assist reinforcements, "round out" the two COSCOMs in theater and reconstitute a COMMZ support base essentially from "scratch." Heavy reliance is placed on host nation labor, facilities, and transport to make all this happen. Prepositioned war reserves, particularly unit sets of equipment (POMCUS stocks) and ammunition are particularly vulnerable due to their known locations. Provision of protected storage in peacetime is aggravated by real estate, manpower, and funding constraints. Bulk POL tank farms and pipeline systems are also highly vulnerable to sabotage. Training of supply units at all levels is based on the assumption of a non-nuclear environment. The vulnerability of typical supply operations as now conducted in brigade, division, and corps field exercises should be of concern. The supply units

are too burdened with supplies on hand at the expense of mobility. More emphasis in field exercises is needed on frequent relocation of supply points, proper use of available cover and concealment, camouflage of equipment, preparation of shelters for groups and individuals, conduct of night operations, and maintenance of strict communications discipline. Supply and transport units lack experience in operating from dispersed locations and in locating and resupplying dispersed combat elements. Such training is needed to identify deficiencies in tables of organization (TOE) as well as in procedures. The introduction of automated data processing equipment to support Army standard supply and maintenance management systems in the divisions, corps, and at COMMZ and theater army (TA) level has resulted in a critical vulnerability. Automated procedures in the continental US (CONUS) make manual entry virtually impossible. Greater attention is needed in theater to operating during periods of extended computer outage, reducing automation requirements, using alternate data storage files, increasing redundancy in ADP equipment (ADPE), preparing sheltered sites for mobile ADPE, and using alternate transmission means. Reconstitution as a word, or guidance on how it will be accomplished, is not covered in current CSS doctrine. Armed with rear area security and damage control plans, commanders are expected to work themselves out of disasters the best way they can. More definitive guidance and instruction is needed for reconstituting essential CSS support.

4-1.4.3 Essential Maintenance and Decontamination. As in supply operations, maintenance doctrine has undergone considerable change. Greater capabilities for repair of weapons systems in the forward area and the reorganization of maintenance and associated repair supply on a commodity basis are the most recent changes in doctrine. However, the new units and capabilities have yet to be tested and fielded. Thus, those aspects of increasing rapid repair capabilities of weapons systems and combat vehicles on the battlefield will remain as a significant strength in current and future doctrine. However, the weaknesses in current doctrine and organization for essential maintenance and decontamination on the integrated battlefield parallel those of essential supply support. As a result of reorganizations and economy moves, maintenance units in the COSCOM in Europe are reorganized differently from the rest of the Army. The introduction of the new general support (GS) maintenance centers will take time. No consideration in either case has been given to operating

in an integrated battlefield environment as the expected norm of a U.S. NATO/Pact conflict. Doctrine and procedures for decontamination of personnel, equipment, and facilities are well documented in field and technical manuals. However, current organic capabilities fall far below the level of anticipated need during the conduct of operations on the integrated battlefield.

4-1.4.4 Transportation. A strength in U.S. doctrine is the concept of movement by a single transport unit as far forward as possible. The relay of trailers under load is normal practice in motor transport line haul operations. Organization of transport resources in the COMMZ under one command for movement from the ports to the combat zone remains as a basic principle in U.S. doctrine. However, peacetime economy measures have reduced U.S. transport resources to the point where they cannot rapidly respond to contingency support requirements. A major vulnerability to essential CSS support in Europe is the reliance on host nation transport for the dispersal and delivery of prepositioned war reserve stocks. The rail net in Europe is extensive but vulnerable to damage by nuclear weapons and interruptions by sabotage. Host nation civilian motor transport units cannot be mobilized early enough. U.S. motor transport units without heavy reinforcement from CONUS can move only a fraction of the lift requirements. Host nation operations in any level of conflict are currently approved doctrine and national policy. Alternative means for continuing support in the event such support is inadequate in an integrated battlefield environment need to be acquired and exercised.

Transportation doctrine, organization, training and procedures for support of the corps and divisions on the integrated battlefield are almost totally lacking. The cost required for highly dispersed operations in terms of additional transportation capability will be considerable. The major weakness here, as in all other areas of combat service support, is that we have not actively sought a way to support combat units on the integrated battlefield.

4-1.4.5 Communications for CSS Support. The flexibility, redundancy and mobility of the tactical communications systems are a significant strength. The Defense Communications System can with present equipment, also handle a high volume of administrative and logistic communications traffic. The

ability to continue these workloads in an integrated battlefield environment is questionable. The critical vulnerabilities are the fixed CP and their communications links for coordinating operations between and among the major subordinate commands. Interruptions in service due to nuclear effects are matters of concern. A second vulnerability is the amount of intelligence information that can be obtained from non-secure communications. In some instances secure communications means may be inadequate; in most cases communications security is not as stringent as it should be.

4-2 PACT FORCES BATTLE SUPPORT.

4-2.1 Army Level.

The Soviet army has recently streamlined its logistics organizations, procedures, and has added motor transport to the Front, armies, and divisions to support doctrinal changes emphasizing surprise, speed, and deep envelopments. Operating on the nuclear battlefield is integrated in their doctrine and field training. A strong mobilization base and option to launch the first attack provide them with a strong logistic support advantage initially. It should be noted that most of the major support units in the Soviet force structure are located at the Front level.

4-2.1.1 Medical Treatment and Evacuation. The Chief of the Army Medical Service, under the Deputy Commander for Rear Services, supervises the Chiefs of Medical and Evacuation units of the army hospital base and the Senior Physician of each of the divisions. The hospital base is the first level in the evacuation chain with special medical treatment capabilities. Arriving patients are sorted for surgery and treatment in the mobile field hospitals specializing in head wounds, burns, thoracic and abdominal wounds, etc. The army medical depot stores and resupplies division medical units using army transportation. The army also has mobile field hospitals and evacuation hospitals in reserve which can reinforce the medical support of the divisions or expand the army base complex as required. Evacuation of patients from division medical points is by army transport. Air evacuation is used if the

tactical situation permits. Patients requiring additional treatment and convalescence are evacuated to Front hospitals by Front land and air transport.^{21/}

4-2.1.2 Resupply and Reconstitution. The Front and army supply bases are both organized as a mobile base. Again, the army base is positioned close to a railhead and with a rail net for resupply from the Front. Forward supply points may be established close to division rear areas when support distances become too great prior to relocation of the army base. The base is normally 50-150 kilometers behind the FEBA.^{22/} The basic principle of "resupply forward" is the key to keeping the divisions mobile and resupplied while engaged in continuous combat operations. Principal means of delivery to the division is by cargo and tanker vehicles of the army motor transport regiment. In urgent situations, army transport units may bypass division supply points to resupply units, particularly ammunition. Division resupply requirements are computed by the branch chiefs (Ammo, POL, food, supply, medical, etc.) and ordered from the mobile depots. Resupply rates ("norms") are used as a control means. Replenishment is based on actual consumption within the established norms, depot stocks on hand and enroute from the front.^{23/} Reconstitution of army divisions no longer combat effective is accomplished after withdrawal of the units. Replacement is by units of the second echelon or reserve units from the Front.

4-2.1.3 Maintenance and Decontamination. The Deputy Chief for Technical Matters is responsible for maintenance, repair parts supply, and major end items of armored and motor vehicle equipment. He supervises the maintenance and supply operations of the army mobile supply and maintenance depots. The army performs up to major repair level on equipment evacuated from division by army transport. Vehicles repaired are picked up as depot stock having been previously dropped by the original unit. Vehicles may be evacuated from divisions to Front repair shops depending upon the level of workload in the army. Decontamination of areas, facilities and equipment is provided by companies of a chemical battalion. The units are mobile, equipped and trained in reconnaissance and decontamination of areas following nuclear or chemical attack.

4-2.2 Division Level Combat Service Support.

4-2.2.1 Medical Treatment and Evacuation. The division Senior Physician supervises medical service performed by the medical battalion and by the subordinate regimental medical points. Division medical support may be augmented by the army with an independent medical detachment. Treatment is limited to minor surgery and preparation for evacuation to army hospitals. The medical battalion establishes and operates the division medical point. Following sorting and emergency treatment, patients are evacuated from the division by army ambulances or other returning transport. Situation permitting, air evacuation may be employed. Field training stresses full deployment of division medical support with practice in collection and treatment of casualties including handling mass casualty situations.^{24/}

4-2.2.2 Resupply and Reconstitution. The division supply base is located in areas with adequate access roads adjacent to the main resupply units. All division supplies are maintained on vehicles. Requisitions from the regiments are based upon replenishment within norms established for the regiments and their battalions. The concept of supply forward is used. The major resupply elements are the division dumps (ammunition, POL, ration, field baking and water point), some 20 to 30 kilometers to the rear of the line of departure or FEBA. Shower and laundry elements are also located in the division supply base area. Supplies are normally delivered to regimental supply points. As previously noted in urgent situations, a skip channel procedure may be used, bypassing an echelon to expedite delivery. For example, Front transport may deliver ammunition to division artillery units, army vehicles may deliver to regimental artillery battalions. Bulk POL delivery follows the same pattern. Rations likewise are distributed to the regiments, the field bakery unit providing support for the entire division. Requirements for repair parts, vehicles flow through maintenance channels, ammunition and ordnance through artillery channels. Resupply is made from division vehicle, artillery and small arms depots and ammunition dumps. Replenishment by requisition and status reports is based upon "norms" established by the division for its subordinate units. Highest priority is given to ammunition and POL. The

governing principle is for units to begin the day with full allowances of ammunition uploaded and POL on vehicles to complete the units mission of the day.

4-2.2.3 Maintenance and Decontamination. Maintenance support in the division is the responsibility of the Deputy Commander for Technical Matters. Companies of the organic maintenance battalion establish mobile repair shops separately for tracked vehicles, motor vehicles and ordnance (artillery, weapons). "Medium" level of repair at division level consists of the overhaul of two or more assemblies. Emphasis is on prompt repair for return of vehicles to the units. Repair workload exceeding division capability is evacuated by army transportation. The driver and crew remain with the vehicle and assist with repair. If the vehicle requires evacuation for higher level repair, it is dropped from unit records. A replacement vehicle is then issued to the crew for return to their unit. Decontamination support is provided by decontamination companies of the division chemical battalion. The units are organized, equipped, and trained for decontamination of personnel, weapons, light and heavy vehicles.

4-2.3 Combat Service Support, Regiment and Below.

4-2.3.1 Medical Treatment and Evacuation. The regiment is the lowest level where doctors are assigned. The Regimental Senior Surgeon is responsible for supervising the medical service of the regiment including the operation of the Regimental Medical Point and medical service of the feldshers (physician assistants) of the battalions. The regimental medical point is the first step in the evacuation chain that a patient may be treated by a physician. Feldshers, who have received two to four years of medical training, and aidmen assist in the treatment of the casualties. The lightly wounded are quickly returned to duty. Those requiring further treatment are prepared for evacuation to division. Although Soviet doctrine stresses high priority to rapid evacuation of the wounded, there are very few ambulances in the division medical battalion to clear casualties from the regiments. Again, returning supply vehicles are used. At battalion and company level, a feldsher and medical corpsmen establish the battalion medical point. Orderlies, trained by the feldsher and company aidman, are in each platoon. The company aidman and

orderlies provide first aid treatment on the battlefield and move patients to company collection points. The feldsher is responsible for the evacuation of patients to the battalion medical point. Here, treatment is limited to emergency lifesaving measures by the feldsher and aidmen and preparation of patients for evacuation to the Regimental Medical Point.

4-2.3.2 Resupply and Reconstitution. At regiment level, the deputy commander for the rear services is responsible for combat service support. A regimental supply point is established from 5 to 15 kilometers to the rear of the line of departure. All supplies are loaded on vehicles prepared for rapid relocation. Resupply of the battalions is based upon "norms" established by regiment and delivery by regimental transport. Battalion requests are consolidated by regiment and forwarded to division. Again, requisitions for medical supplies, ammunition and ordnance, and repair parts go up their separate channels. At battalion level all CSS functions are the responsibility of the battalion commanders. He is assisted by the chief of battalion staff, deputy commander for technical matters and one supply platoon commander. The chief of battalion staff is responsible for ammunition, food and other supplies less POL, vehicles, ordnance items and repair parts. The latter are the responsibility of the deputy battalion commander for technical matters. The supply platoon is organized into a motor transport section and supply section. Also located in the battalion rear area are the technical maintenance section and medical point.^{25/} Ammunition is delivered to battalion ammunition points by vehicles of the regimental motor transport company. The battalion supply platoon delivers ammunition to companies on oral requests from the company commanders. The company first sergeant is responsible for the receipt of supplies and selects points for off-load/transfer of ammunition. Resupply during combat is accomplished at nearby locations out of direct view of the enemy. The Soviets put great stress on maintaining refueling on the march. The battalion commander plans and directs refueling operations so that vehicles on board reserves are topped off with fuel when ready for attack. On board fuel is not used without the commander's approval.^{26/} Rations are also delivered by battalion to the companies. Whenever possible hot food is served before combat because of its importance to morale. The packaged combat rations are not used except in an emergency. As in the case of larger formations, regiments continue to fight

in combat without relying on individual replacements. When reduced to a level where the unit is no longer effective, it is replaced by the next echelon.

4-2.3.3 Essential Maintenance. At regiment and battalion level only routine level maintenance is performed. This level consists of the replacement, adjustment or repair of individual components that can be replaced in a minimum of time. Maintenance is performed by vehicle crews and mechanics of the battalion and regiment repair shops. Preventive maintenance is emphasized in an effort to keep vehicles at a high state of combat readiness. An inspection is made prior to each movement. Preventive maintenance is scheduled with allotments in time for each, based on distance travelled. Reports indicate that loss rates for maintenance failures are very low. Repair and recovery of combat vehicles in action are well organized under the deputy battalion commander for technical matters. He establishes a technical observation post (PNT) in an armored vehicle with radio contact with the battalion commander, mobile repair and evacuation groups and with his regimental counterpart. The location and degree of damage of each vehicle recorded. The repair group is directed to vehicles most readily repairable, in place if possible or towed to a sheltered position. If not repairable within 3 to 5 hours, vehicles are reported to and left for the regiment to evacuate. The PNT must relocate frequently to keep no more than one or 1.5 kilometers behind the forward units.

4-2.4 Communications Support.

As normal policy, the commander of the combined arms army will establish forward, main and alternate CPs equipped with mobile communications means. Once the CPs depart from their initial prepared locations, the CPs rely on mobility and redundancy for survivability and continuity of command and control. A signal regiment with radio, telephone/teletype and radio relay subunits provides communications support with a wide range of HF, UHF, VHF and land line service. Emphasis on communications support is to continuously update intelligence on enemy locations and dispositions using all available acquisition means including communications intelligence/electronics intelligence (COMINT/ELINT), monitor the progress of the battle, and rapidly transmit orders to subordinate units. As with U.S. ground communications

centers and equipment, the Soviets are vulnerable to direct attack and jamming. However, they reduce their vulnerability by redundancy, mobility and strict adherence to communications security and discipline, and other passive means.

The division command posts (forward, main and alternates) and supporting communications systems are mobile. Support provided by the organic division signal battalion consists of radio, teletype, telephone and courier service. In the offense the communications elements are prepared to displace frequently, particularly in exploitation following a breakthrough.

Regiment and battalion command posts are mobile with a minimum number of vehicles and radios for directing combat operations. Only a single radio net is available at battalion level.

4-2.5 Strengths and Weaknesses.

4-2.5.1 Medical Treatment and Evacuation. The principal strength of the Soviets is in the training of the individual in survival on the integrated battlefield with emphasis on self and mutual first aid. The soldiers expect and are used to hardship on the battlefield. The medical personnel and units undergo realistic field training including treatment of mass casualties. The major weaknesses of medical support are in the austere level of support forward, and the multi-stage chain of evacuation. The lack of organic medical transport may slow the evacuation and result in a high loss of life.

4-2.5.2 Essential Resupply and Reconstitution. The principal strength is in the streamlined organization within the divisions and procedures for resupply. The austere levels of supply, coupled with supply discipline and the lower standard of living accepted by the soldier, lower the logistic burden and enhance mobility. The main weakness is the vulnerability of the support base at army level. Although the Soviets emphasize passive defense measures, the supply dumps, particularly ammunition and POL, are vulnerable to direct attack. Replacement by units in the follow-on second echelon or reserves is a major strength in maintaining the pace of an offensive.

4-2.5.3 Essential Maintenance and Decontamination. Soviet organization and doctrine for support forward are a significant strength. The enforced driver and crew preventive maintenance procedures, if Soviet reports are to be believed, have resulted in an excellent vehicle combat readiness posture. The weakness is the vulnerability of the army repair shops to direct attack. Emphasis on passive measures in field exercise reduces but cannot eliminate this vulnerability. Chemical units are equipped and trained to provide decontamination support to units, facilities and areas contaminated by chemical and nuclear weapons. This is a significant strength when compared to U.S./NATO capabilities.

4-2.5.4 Communications Support. Hardened fixed command posts and redundancy of CPs and supporting communications are major strengths at higher echelons of command. Army and lower levels rely primarily on mobility for survivability. Soviet stress on communications discipline and electronic warfare (EW) as may reduce vulnerability are also strengths. There is some evidence that more attention has been given to hardening of some equipment to nuclear secondary weapon effects. The major weaknesses are in the vulnerability of radio links to nuclear effects.

SECTION V

SCENARIOS

5-1 PURPOSE.

Scenarios provide a context within which there can be a rational development of tactical nuclear warfare requirements and issues. Uncertainties associated with the initiation and conduct of tactical nuclear warfare by the nuclear powers demand that the scenario framework be broad enough to accommodate all possibilities.

5-2 CONDITIONS INFLUENCING SCENARIOS.

In contemplating the conditions under which tactical nuclear conflict might be initiated in Central Europe, it seems inconceivable that either side, NATO or the Warsaw Pact, would initiate this type of conflict without the pressure of increasing political tension. Political events and sometimes military actions cause increases in tension and heighten the likelihood of military conflict. The presence of NATO and Pact forces in the two Germanys, of itself, creates tension. Since it has existed for more than 30 years it might be characterized as "normal" tension. As events cause intensification of the confrontation between NATO and Pact forces in the two Germanys, there could be "increased tension" and "high tension" leading to a period of warning of the imminence of hostilities. Examples of political/military events which could induce an escalation of tension in Central Europe are:

- Soviet moves into the Middle East, Poland, Yugoslavia, or the North Flank
- Blocking air and land access from West Germany to Berlin
- Soviet force build-up in the Pact area
- Renunciation of the agreements between the Soviet Union, Britain, France and the U.S. to maintain military liaison missions in the zones of occupation.

5-2.1 Tension Escalation.

As tensions increase force postures of both NATO and the Pact can be expected to change in response. Table 1 illustrates how the postures of a U.S./NATO corps and its counterpart, a Soviet/Pact army, might evolve as the state of confrontation escalates from normal tension to conventional, then nuclear conflict. Although the increase of tension, itself, provides warning of the possibility of military conflict, a special "state" of warning is included. Warning in this sense is derived from knowledge of specific activities which taken together indicate an unmistakable intent on the part of the Pact to attack NATO. Warning in this sense is an announced condition and could occur during any state of tension and lead to conventional, theater nuclear or general nuclear conflict. The force postures assumed by the U.S./NATO corps and the Soviet/Pact armies shown on Figure 1 are those considered to be appropriate to the state of confrontation. They may not always be so symmetrical and will depend upon perceptions of each side of the degree of danger (or of advantage). For example, while the normal garrison readiness of the U.S., and German corps is about on the same level as that of the Soviet armies, the normal readiness of other NATO corps and other Pact armies is known to be lower for various reasons. Some of the more cogent aspects of each of the pre-conflict postures are shown below:

- Normal Tension
 - Bulk of units on both sides training in or near garrison locations and major training areas (MTA).
 - U.S./NATO duty strengths degraded by leaves and other absences.
 - Over-strengths in some Soviet units during the May and November rotation periods.
 - Variable numbers of units participating in field training exercises (FTX) away from garrison.

Table 1. Force Postures.

State of NATO-Pact Confrontation	U.S./NATO Corps Posture	Soviet/Pact Army Posture
Normal Tension	Normal Garrison Readiness	Normal Garrison Readiness
Increased Tension	Increased Garrison Readiness/ Alert Exercises	Increased Garrison Readiness/ Alert Exercises
High Tension	Alert Exercises FTX/Increased MTA/ Dispersal of NUC Warheads and Launchers/ Selective Reinforce- ment	Alert Exercises/ FTX/Increased MTA/ Deploy Warhead/ Launchers/Selective Reinforcement
Warning	Deploy to Planned Defense Positions/ Deploy NUC Warheads to Delivery Units/ Execute Barrier Plans	Deploy to Planned Defense/Attack Positions
Conventional Conflict	Execute General Defense Plan	Execute Attack Plan
Theater Nuclear Conflict	Execute Authorized Selective Employment Plans/Exploit	Execute Planned Nuclear Strikes/ Exploit
General Nuclear Conflict	Execute Authorized Selective Employment Plans/Exploit	Execute Planned Nuclear Strikes/ Exploit

- Command and control exercised mainly from fixed garrison locations.
- Nuclear (NUC) warheads stored in fixed sites.
- Combat service support conducted from fixed locations.
- Increased Tension
 - Increased tempo of garrison and MTA training and field training exercises.
 - Duty strength increases particularly for U.S./NATO units.
 - Emphasis on battle planning and reconnaissance of assigned battle areas, command post exercises.
 - Emphasis on exercises to improve readiness to deploy troops, equipment, ammunition and supplies from garrisons and MTA.
 - Command and control continues basically from garrison locations with tactical command posts maintained in a high state of readiness to deploy.
 - Nuclear warheads remain stored in fixed sites with increased readiness to deploy.
 - Combat service support conducted from fixed locations.
- High Tension
 - Bulk of troops on field training exercises away from garrison.

- Increased occupation of MTA, particularly on part of Soviet/Pact forces, where such occupation will facilitate deployment to battle positions.
- Nuclear warheads evacuated from fixed sites to field locations which are changed at intervals.
- Launchers deployed to field positions which are changed at intervals.
- Both sides can be expected selectively to reinforce, based upon established priorities. Soviet troops rotation to USSR stops.
- Command and control exercised from field locations.
- Combat service support conducted from combination of fixed and field sites.

● Warning

- On NATO side forces deploy to or in vicinity of planned defense positions and conduct intense intelligence and target acquisition and barrier activities.
- Soviet/Pact forces deploy to or in vicinity of planned attack/defense positions (forward assembly areas for second echelon forces). Maximum use of MTA in the border area as a deception may be anticipated. Intensive intelligence and target acquisition activities conducted.
- Nuclear warheads delivered to vicinity of launchers on both sides; missile units on quick reaction alert (QRA).
- Selective reinforcement continues.

- Command and control exercised from vicinity of planned battle locations and redundant communications systems are established.
- Combat service support conducted mainly from field sites although many fixed sites still used.

5-3 SCENARIOS.

We believe that there are four plausible situations in which tactical nuclear warfare might be initiated -- three, where the Pact launches the first strike, and one where NATO strikes first, as follows:

- Pact strikes first.
 - I Pact forces deployed, NATO force in garrison, little warning
 - II Both sides deployed, some warning
 - III After a period of conventional conflict.
- NATO strikes first.
 - IV After a period of conventional conflict.

Figure 1 relates these scenarios to the force postures contained in Table 1.

This study will undertake to develop requirements and issues related to all scenarios, however, emphasis will be placed on II and III as being the more likely to occur.

U.S. NATO Corps Posture	First Strike	Soviet/Pact Army Posture
Normal Garrison Readiness		Normal Garrison Readiness
Increased Garrison Readiness/ Alert Exercises	I	Increased Garrison Readiness/ Alert Exercises
Alert Exercises/FTX/ Increased MTA/Dispersal of NUC Warheads and Launchers	I Ia I Ib	Alert Exercises/ FTX/Increased MTA/ Deploy W'Heads/ Launchers
Deploy to Planned Defense Positions/NUC Warheads Deployed to Delivery Units	I Ic	Deploy to Planned Defense/Attack Positions
Execute General Defense Plan	III IV	Execute Attack Plan

Direction of Arrow Indicates Direction of Strike
Figure 1. Likely Scenarios.

SECTION VI

OPPOSING U.S./NATO AND SOVIET/WARSAW PACT TACTICAL NUCLEAR WARFARE DOCTRINES: THE ASYMMETRIES

6-1 INTRODUCTION.

In the preceding doctrinal sections we defined tactical doctrine in a way that related it to warfighting capability. We stated that in its most complete form doctrine provides a detailed understanding of how the forces involved will prepare and train for specific tactical operations to include the planning, controlling and supporting of these operations. The purpose of this section is to identify the major asymmetries, which prevail currently between the opposing tactical doctrines. While we do recognize the deterrent role which U.S./NATO tactical nuclear weapons are supposed to play in Europe, we have elected to focus this analysis on warfighting capability, should deterrence fail. The preceding doctrinal sections concluded with statements of U.S./NATO and Soviet/Pact strengths and weaknesses. Based upon these, a comparison of the opposing doctrines is made in this section. The elements of comparison are reflected in Figure 2 along with scenario driven doctrinal requirements. The issues, then, will be determined from the asymmetries and the doctrinal requirements.

6-2 PEACETIME PREPARATION.

6-2.1 System Mixes.

Substantial differences in systems mix exist between the opposing forces with respect to both delivery systems and weapon yields. Soviet emphasis is placed heavily on surface-to-surface missile (SSM) systems. The FROG, SCUD and SCALEBOARD units constitute about a thousand delivery systems. All indications are that this emphasis will continue as the Soviets have replacement systems in development for all three of these tactical SSM. Weapon yields are high, the majority ranging from 20 to 500 kilotons. While General Yakushin declined to comment on the nuclear capability of their

cannon artillery, the Soviets are known to possess such a capability on a small scale.^{27/} Well over 2000 of Soviet tactical fighter aircraft possess a nuclear delivery capability. However, the Soviet doctrinal penchant for massing both fires and maneuver, and the relative lack of sophistication of these aircraft suggest that some these will not be employed in a nuclear role. The Soviets are not known to possess either atomic demolition munitions (ADM) or nuclear-capable surface to air missile systems. On the U.S. side the numerical emphasis has been largely on dual capable cannon (155 mm and 8") systems which are inherently capable of responsive small yield delivery. Deployment of Lance has provided a mobile and survivable nuclear SSM capability in relatively small numbers. The Pershing Battalions and over 1400 tactical aircraft provide a substantial nuclear strike capability which includes SACEUR's quick reaction alert (QRA) force. However, weapon yields of these systems are high, and Pershing and tactical air units in peacetime locations, including the QRA force, are highly vulnerable to a Soviet preemptive strike. The ADM element of the U.S./NATO TNF provides a tactical means of creating substantial obstacles to Soviet/Pact maneuver of forces. However, as discussed in the earlier section on U.S./NATO doctrine, release timing along with prechambering/fallout limitations are likely to reduce substantially the tactical utility of this capability.

6-2.2 Organization.

The organizational differences between U.S./NATO and Soviet/Pact TNF stem largely from the system mix differences. Soviet operational-tactical nuclear delivery units are independently organized and centrally controlled by the Front Commander. Thus, responsiveness to the operational-tactical nuclear strike plan is provided within the limitations of warhead provision, target acquisition capabilities and knowledge of current maneuver force dispositions. In contrast U.S./NATO organizational arrangements are more complicated. Nuclear missile units and nuclear capable tactical aircraft are independently organized, with SACEUR being the integrating commander. On the other hand, a substantial portion of the nuclear capable cannon artillery units belong to the lowest executing command level, i.e. division. The French systems are, of course, independent of NATO task organization and control.

6-2.3 Systems Mix/Organization Interaction.

System mixes and organizational structures should be supportive of the related doctrinal precepts. The inventory of Soviet systems, and organizational/C² arrangements are generally compatible with their doctrinal principle of employing nuclear fires in mass. The mix of U.S./NATO systems contains a wide variety of weapon yields and delivery systems organized within multiple command levels. Thus, it is not clear that the U.S./NATO systems mix and organizational arrangements are supportive of the MC 14/3 stated precept of selective employment which minimizes collateral damage and the risk of escalation.

6-2.4 Training.

Soviet writings and current intelligence reports indicate that considerable emphasis is given to training Soviet/Pact commanders, staff officers and troops for tactical operations in a conventional/nuclear/chemical environment. In contrast, U.S./NATO training borders on being perfunctory. Neglected in training are the manifold demands which tactical operations in this environment will place on the command and control of maneuver forces, communications, the protection of troops, equipment and field installations, mass casualty evacuation and treatment, other combat service support, unit reconstitution and individual soldier performance. Major shortfalls exist across the board; in Section VII we will discuss and recommend specific requirements with respect to curricula within the Army school system, training of commanders, their staffs and individual soldier, and unit training. This dichotomy is a major asymmetry between U.S./NATO and Soviet/Pact forces.

6-2.5 Warning and Intelligence.

Warning is a key element to the net assessment of U.S./NATO and Soviet/Pact TNW doctrines. Consideration of U.S./NATO peacetime force dispositions and overall strategy emphasize the importance. Tactical nuclear delivery means and warhead stores are highly vulnerable in their peacetime locations. Dispersal subsequent to warning is counted on to reduce this

vulnerability substantially. A great deal of U.S./NATO conventional warfighting capability is not based in Europe. Again sufficient warning to allow the deployment of reinforcements is being counted on to remedy a major warfighting weakness. In contrast, Soviet/Pact forces have about 60^{28/} divisions in peacetime locations that make them immediately available for an attack on U.S./NATO forces. The westward location and routine Soviet/Pact use of their major training areas add to the capability for launching a surprise attack. This capability coupled with the peacetime vulnerability and widespread wartime dispersion of the U.S./NATO TNF, must prompt Soviet planners to give serious consideration to the advantages which would ensue from a bolt out of the blue attack. Comparative peacetime intelligence capabilities exacerbate this situation. The U.S. and NATO place a high dependence on tactical and national electronic surveillance systems. While much valuable intelligence is collected by these means, it is certainly possible for the Soviets to almost concurrently counter these systems in mass while undertaking the final preparation for a preemptive attack. The Soviets, on the other hand depend heavily on agent intelligence which operates effectively in the peacetime open society of Western Europe. Thus, their data base on the dispositions of the U.S./NATO TNF can be kept currently accurate. As a result, U.S./NATO forces are likely to possess far less preattack knowledge of the Soviet TNF.

6-2.6 Planning.

Recent emphasis and efforts have resulted in a clearly defined process for U.S./NATO selective employment planning that is compatible with U.S./NATO nuclear release procedures. The doctrine for implementation of this planning process exists for all levels from SHAPE through division. Given successful wartime deployment of U.S./NATO forces and nuclear release, it is likely that execution of chosen selective employment packages (SEP) could occur. However, when these SEP are viewed in terms of the employment provisos in MC 14/3 it is not clear that they contribute to a viable doctrine. The yields and quantities contemplated cast doubt on their being recognizable as deliberately constrained selective use; the doctrinal voids with respect to the ensuing combat cast doubt on their military decisiveness; and, finally, the general lack of a U.S./NATO capability to sustain tactical operations in a

nuclear environment raises questions as to the overall viability of SEP employment. Soviet writings indicate that planning emphasis is focused on the massive and comprehensive first strike to destroy U.S./NATO tactical nuclear capability, and to alter the correlation of forces along selected avenues for the exploitation of the nuclear strikes by massive armored formations. This planning emphasis is compatible with Soviet doctrine and thus contributes to Soviet/Pact tactical capability, especially in the limited warning scenarios. Matters of command and control are simplified by Soviet planning and the need for friendly troop warning is generally obviated. Planning for subsequent employment is not detailed nor well defined with respect to procedures. Command and control problems of some magnitude would likely challenge Soviet planners.

6-2.7 Summary.

Table 2 presents an overall summary of U.S./NATO and Soviet Pact asymmetries with respect to peacetime preparation.

6-3 POSTURE AFTER WARNING.

6-3.1 Readiness.

6-3.1.1 Scenario Effects. Readiness asymmetries after warning are scenario dependent. Warning, a very high state of tension, indicates that NATO has perceived the imminence of an attack by the Pact; indications are largely unambiguous and appropriate announcements have been broadcast through NATO and national alert systems. The degree of readiness asymmetry will be a function of the differences between Pact and NATO Postures at warning as described in Figure 1. If the Pact has been successful in concealing its activities the readiness asymmetry could be great. On the other hand, if warning were to be preceded by an extended period of tension, NATO may have been able to take measures to increase readiness and thus reduce the asymmetry.

6-3.1.2 Nuclear Delivery Means and Warhead Deployment. After warning there will be uncertainty as to the role of tactical nuclear weapons in the Soviet

Table 2. U.S./NATO-Soviet/Pact Asymmetries Peacetime Preparation.

Comparison Element	U.S./NATO Forces	Soviet/Pact Forces	Degree of Asymmetry
System Mix/Organization	Variety of yields -predominantly cannon artillery -significant TACAIR capability	Large yields -predominantly SSM force -large number of frontal aircraft	+ for Soviets; (compatible with written doctrine)
Training	Inadequate and unrealistic training except for selective employment planning	Emphasis and resources being spent on all aspects of Tactical Nuclear Warfare Training	+++ for Soviets
Intelligence/Warning	Strategy and TNF survivability dependent on warning	Well disposed for short warning hostilities. TNF warhead locations unknown	++ for Soviets if they choose to exploit
Planning	Reactive and oriented toward SEP planning	Decisive and oriented toward massive first strike	++ for Soviets

battle plan. The prudent assumption would be that Front forces will be prepared at warning to execute a nuclear strike, at least preemptively. Warheads would be deployed to concealed field storage sites in the vicinity of planned firing or launch positions and dedicated preparation teams would be immediately available. At warning NATO nuclear delivery forces, except for those on QRA, might well be in garrison locations with warheads stored in the peacetime fixed sites. If, after warning, time were available to deploy launchers and warheads to vicinity of launch and firing positions, this movement could be tracked by agents and other intelligence means. Thus, it could be concluded that, unless NATO means and warheads were deployed prior to warning, they would be much more vulnerable than Soviet means and warheads during the warning period.

6-3.1.3 Force Deployment and Reinforcement. By its very nature, warning suggests that first echelon Pact attacking forces are largely in place in forward assembly areas which could include the large peacetime training areas near the East-West German border. Second echelon forces would be moving to or in preselected intermediate assembly areas. Reinforcing echelons from the Soviet Union would be in movement by rail and air. The known Soviet capabilities to cross water barriers by tactical means and to move large tank formations by transporter would facilitate reinforcement by multiple routes over a broad front. Although the U.S. and some NATO corps could deploy very quickly after warning, other corps, particularly in Northern Army Group, could not deploy until after a time consuming strength build-up. The reinforcement situation would be even worse. In spite of programs to preposition equipment, U.S. reinforcing forces probably could not deploy as rapidly as their counterparts in the Western USSR. Other NATO countries could not contemplate significant reinforcement prior to mobilization and refresher training.

6-3.2 Target Acquisition.

The effectiveness of Soviet target acquisition will be scenario dependent. With more warning and a U.S./NATO posture of higher readiness, the Soviet target acquisition problem will be more difficult. Soviet doctrine places U.S./NATO nuclear means as first priority. Thus, their problem against

the dual capable cannon artillery will become, with deployment, a severe challenge to Soviet capabilities. There is, however, a danger here to U.S./NATO forces. The short-range capability of these cannon systems and the expected fluidity of the battlefield raise the specter of their capture and subsequent employment by the captors against U.S./NATO forces. However, other U.S./NATO systems, particularly strike aircraft bases, present the Soviets with less of a target acquisition problem. This latter situation adds to the importance of Lance and the submarine launched ballistic missiles (SLBM) committed to SACEUR as elements in the U.S./NATO TNF. Current U.S./NATO SEP place emphasis on Soviet/Pact second echelon maneuver forces. Thus, standoff acquisition means become an essential capability to U.S./NATO doctrine. A developmental program including various advanced sensor technologies and "real-time" fusion through automated templating is underway and holds considerable promise. However, these promises must be fulfilled before U.S./NATO capability against second echelon forces can take on viable meaning. The Soviet dependence on SSM in their TNF reinforces the U.S./NATO need for real-time standoff target acquisition. These Soviet SSM are deployed in depth and present widely dispersed target arrays which can be successfully attacked only by weapons of extremely high yields or the accurate acquisition of individual transporter erector-launchers (TEL).

6-3.3 Summary.

Table 3 presents an overall summary of U.S./NATO and Soviet/Pact asymmetries with respect to posture after warning.

6-4 NUCLEAR RELEASE.

6-4.1 Comparison of Opposing Procedures.

Just as the intended purposes of employing tactical nuclear weapons are fundamentally different between U.S./NATO and Soviet/Pact forces so are the procedures for nuclear release. Underlying the procedural differences is this dichotomy of intended employment. Overall the principal differences involve the chains of release, consultations with allies and the types of nuclear release expected.

Table 3. U.S./NATO and Soviet/Pact Asymmetries Posture After Warning.

Comparison Element	U.S./NATO Forces	Soviet/Pact Forces	Degree of Asymmetry
Readiness: Nuclear Delivery Means	Garrison or moving to firing positions	Concealed at or near firing positions	+ for Soviets
Nuclear Warheads	Fixed sites or moving to field sites	In concealed field sites near delivery units	+ for Soviets
Attacking/ Defending Forces	Partial deployment or moving to FEBA	Most forces in or near attack positions	++ for Soviets
Reinforcing Forces	Some movement but build-up slow	In movement or arrived in designated positions	++ for Soviets
Target Acquisition	Problems in real-time acquisition of Soviet nuclear delivery means	Problems in real-time acquisition of deployed nuclear capable NATO artillery	Variable

6-4.1.1 Chains of Release and Consultation with Allies. Soviet nuclear release will be clearly top-down and should prove to be quite responsive. For the NCA, following little or no consultation with Pact allies, the Soviet High Command (STAVKA) will pass the release directly to the Front unless Theater Commands (TVD) have been established. Even then, a form of directness will exist from the use of skip echelon communications. Though vulnerable to EMP effects given a U.S./NATO first strike, redundant communications and nuclear hardened command posts posit responsive nuclear release. In contrast, the U.S./NATO release system is involved and complex, as cited previously in paragraph 2-3.4. While U.S./NATO procedures have moved toward a top-down system, bottom-up requests remain an integral part of the overall release system. It is also clear that whether top-down, bottom-up or a mixed system, that U.S. consultation with its NATO allies is an integral part of the system. Agreed procedures reflect that just two hours are to be consumed for these consultations at a single level between the NCA and the NATO Military Committee. Such expediency seems unlikely to us. Consultations are more likely to occur at both the highest military command and national levels adding an indeterminate time to the estimated planning factor of twenty-five hours. Thereafter, the U.S./NATO release chain is more complicated than the Soviet's. Although skip-echelon communications are to be used, error-free and properly authenticated release messages must pass from the NCA through Supreme Headquarters Allied Powers Europe (SHAPE), Allied Forces Central (Europe) (AFCENT) and Army Group to Corps.* Supporting communications are vulnerable to intercept and the effects of EMP. While programs are underway to improve U.S./NATO release communications, there is no comparable program for the nuclear-hardening of the U.S./NATO command posts.

6-4.1.2 Types of Nuclear Release Expected. All Soviet writings and intelligence reports make it abundantly clear that the initial employment of tactical nuclear weapons by the Soviets will be a massive theater-wide strike to destroy NATO's nuclear capability and to alter substantially the correlation of forces in Soviet favor. Soviet target priorities, presented in the succeeding paragraph, underline the importance which the Soviets attach to an initial theater-wide strike. Ongoing deployment of the SS-20²⁸ with its

*NATO Chain. U.S. Chain is NCA, European Command (EUCOM), U.S. Army Europe (USAREUR) and corps.

improved accuracy, range capability and direct communications with STAVKA further emphasizes this point. Driven by the provisos of MC 14/3, U.S./NATO planning reflects a definite proclivity toward some form of selective release. The military objective is to stop the Soviet/Pact attack in its tracks by the infliction of heavy losses, forcing a political decision on the Soviet's part to cease the attack and withdraw. A Soviet/Pact failure to arrive at such a decision would seem to leave a major warfighting asymmetry, based not only on opposing military capabilities, but on opposing doctrines as well.

6-4.2 Target Priorities.

In the preceding discussion on warning and nuclear release, we have mentioned some of the differences in target priorities. Soviet writings consistently emphasize that their first priority is to destroy U.S./NATO means of nuclear attack^{29/}. Thus, along with the certainty of initial theater-wide employment we must assume the likelihood of a Soviet preemptive attack, given indications to the Soviets that U.S./NATO forces are in the active process of obtaining nuclear release. Succeeding Soviet priorities are directed at altering the correlation of forces in support of exploitation by massive armored forces. In consonance with selective employment package doctrine, U.S./NATO forces place their first targeting priority on the committed Soviet/Pact units and their immediate reserves. These targets are followed in priority by the lead elements of the second echelons. Clearly, the top U.S./NATO target priorities are aimed at remedying the conventional ground force imbalance.^{30/} Following these top priorities, U.S./NATO doctrine prescribes attacking Soviet nuclear systems, other combat support systems and selected C³ field installations. Table 4 summarizes the opposing target priorities for nuclear fires.

Table 4. U.S./NATO and Soviet Tactical Nuclear Target Priorities.

Priority	U.S./NATO	Soviet
1	Committed Soviet/Pact forces	Nuclear delivery means
2	Lead elements - Second echelon forces	Main grouping of maneuver forces along major avenues of approach
3	Nuclear delivery systems	C ³ of main groupings of maneuver forces
4	Other combat support forces and selected C ³ targets	Other combat support forces

6-4.3 Relative Timing.

Four factors influence the likelihoods with respect to the relative timing of U.S./NATO and Soviet tactical nuclear strikes. These are:

- The Soviet doctrinal penchant to reach a quick military decision through the employment of maneuver forces and fires in mass,
- The prime importance which the Soviets place on the destruction of U.S./NATO nuclear delivery means,
- The substantial differences between the Americans and the Soviets with respect to consultation with allies prior to the tactical employment of nuclear weapons, and
- The likely differences in the time required to pass a nuclear release message given NCA decisions.

There are some indications that the Soviets would prefer to fight and win their objectives in Europe without the employment of theater nuclear weapons. However, the predominant Soviet view is that a European war will inevitably become nuclear. Such a conviction couples the first two factors stated above, and in turn suggests a strong likelihood of a preemptive Soviet strike early in a Central European conflict. On the other hand, the underlying premise of flexible response as enunciated in MC 14/3 and the agreed necessity of consultation among NATO allies suggests that the U.S. and NATO are likely to postpone the decision to employ nuclear weapons until it is clear that the conventional battle is being lost, or until the Soviets have actually employed nuclear weapons within the theater. The last influencing factor simply exacerbates the situation; even with near simultaneous U.S./NATO and Soviet decisions to employ nuclear weapons in the European Theater, it is likely that the Soviets would "get there firstest with the mostest". In scenarios I and IIa clearcut Soviet advantages are readily apparent given their first priority targeting of U.S./NATO nuclear delivery means. In the remaining scenarios, the differences in relative timing may be moot given the U.S./NATO concept of selective employment. In scenario IV a U.S./NATO selective first strike would likely be followed by a massive Soviet strike, on a theater-wide basis, that could well be no less effective than a Soviet first strike would have been in scenarios IIb through III. Much recent discussion within NATO has centered on the importance of relative timing, and those discussions have led to some improvement in U.S./NATO release procedures. However, when consideration is given to the differing employment doctrines, the importance of relative timing from a U.S./NATO perspective is not particularly clear. In contrast, scenarios I and IIa (Section V) seem to offer the Soviets advantages which are surely worth their serious consideration.

6-4.4 Summary.

In all aspects concerned with nuclear release the prevailing doctrinal asymmetries favor Soviet/Pact forces. The most important of these concern the type of release expected in all scenarios and the resulting TNF balances in the scenarios of least warning. Table 5 summarizes the U.S./NATO and Soviet/Pact asymmetries related to nuclear release.

Table 5. U.S./NATO-Soviet/Pact Asymmetries Nuclear Release.

Comparison Element	U.S./NATO Forces	Soviet/Pact Forces	Degree of Asymmetry
Procedures	-Cumbersome and selective -Bottom-up/ Top-down	-Expedient and unconstrained -Top-down	++ for Soviets procedural chain +++ for Soviets in type of release
Target Priorities	-Committed forces -Lead elements of second echelons	-Nuclear delivery means -Main avenues of approach	++ for Soviets adherence to principles of mass and the offensive
Relative Timing	Likely to be deferred	Early and likely to be preemptive	++ for Soviets in scenarios I and IIa + for Soviets in other scenarios

6-5 BATTLE CONDUCT.

This portion of the analysis will extend the asymmetries into the period of tactical nuclear conflict following the release of weapons by the national command authorities of both NATO and the Pact. The conflict is conceived as occurring in the context of a Pact offensive with NATO defending.

An assessment of the doctrine of each side reveals asymmetries in the following areas:

- Nature of the initial strikes
- Target acquisition
- Command and control
- Exploitation of the nuclear strike
- Protection of troops and equipment.

6-5.1 Nature of the Initial Strikes.

Whether the Pact's initial strike is an integral part of an overall battle plan or a preemptive/retaliatory strike, it will be comprehensive and in depth, directed, as indicated in Table 4.

The strike will not be delivered on targets which can be effectively engaged and neutralized by conventional forces and supporting artillery. There is little convincing indication in Soviet doctrinal literature that limitations on yields or other constraints for political reasons will be imposed and dilute what the Soviet military command would consider the mission effectiveness of the strike. Even the larger operational-strategic weapons will be used, if required. The most appropriate delivery means for each target will be selected. Missiles will be delivered on fixed targets and air

munitions on mobile targets and those close to the line of contact (if it were deemed necessary to engage the latter by nuclear rather than conventional means). Pact troop safety will be assured by coordinating movement schedules rather than issuing warnings.

In contrast, the character of NATO's initial strike(s) will depend greatly upon the political judgments of the national command authorities. Unlike the Soviet Army commander, the NATO corps commander cannot rely on NATO's first nuclear strike having an immediate, direct effect on his combat operations. Even if he is authorized to use nuclear weapons in execution of an approved SEP, he is subject to yield and geographic limitations to reduce collateral damage. Because of the uncertainties associated with the timing and terms of nuclear release, the NATO corps commander is forced to look at his nuclear employment options in terms of augmenting resources available rather than as a key element of his defense plan. This conditions his target priority as indicated in Table 4. Faced with a penetration of his battle position, he could be expected to employ his nuclear capable artillery to destroy maneuver forces and artillery within the penetration and to use Lance missiles on forces seeking to exploit the penetration, as well as on acquired FROG and SCUD positions within Lance range. Available air-delivered weapons would be allocated appropriate targets beyond Lance range. Forces close to nuclear targets will be warned by message (the likelihood that these messages will be intercepted and identified by Pact monitors exists).

6-5.2 Target Acquisition.

The Pact will rely heavily on reconnaissance aviation, electronic intelligence, long-range patrols inserted by air, and established agents to acquire targets. Since many targets in the NATO rear (airfields, communication nodes, etc.) cannot be easily moved, target lists developed before the start of hostilities will be useful. Because of the dual nature of NATO artillery, nuclear capable batteries will be relatively easy to locate and target when firing conventional missions. The large number of batteries and their normal displacements would, however, complicate the Soviet acquisition problem.

NATO's target acquisition problem is different. In the NATO corps area of interest targets will be more mobile. Soviet missile delivery units can be expected to be silent and well-concealed prior to launch operations. The coordinated employment of electronic means, air reconnaissance, ground and airborne radars and sensors will form the core of the acquisition effort. Intelligence provided by agents and long-range patrols will probably be meager. Target lists developed before the start of hostilities will have little value.

6-5.3 Command and Control.

It is likely that the major command and control asymmetry will lie in the degree of stress to which the opposing systems will be subjected. The Pact can be expected to execute a preconceived, detailed and well-briefed battle plan. Commanders at all echelons should have a clear understanding of the tasks required of them and the timing of their execution. Computers will assist in the fusion of information. Coordination of the nuclear strike will be an integral part of the battle plan and control of the strike will be exercised over dedicated communications networks. Because of the centralized nature of Pact command and control, a legitimate question arises as to how commanders at lower echelons will react to situations not foreseen in the centralized plan, when, in spite of built-in redundancies, communications are interrupted. The exercise of "initiative" in the Soviet meaning could lead to serious tactical blunders because "initiative" does not confer the right to deviate from the plan in the absence of authority to do so.

The stress on NATO command and control during operations will be great. Once the NATO corps is deployed to its planned defensive positions so many contingencies are possible that planners are overwhelmed. As one U.S. corps commander put it some years ago,* "The defense plan gets us to where we think we can best handle the initial enemy attack. We will have to depend on our God-given brains from then on." The fusion of information will greatly stress command and control at corps, division and brigade level. Unlike the Soviet system the control of nuclear delivery means is not only decentralized after release but must be exercised over channels not dedicated to this

* Lt. Gen. James H. Polk, Commander, U.S. Corps, 1964-1966.

mission. Use of precedence procedures (flash, etc.) means little when circuits are overloaded, jammed or broken down. On the other hand, decentralization of command and control permits the exercise of "initiative" in the English language meaning. NATO corps commanders will expect their subordinates to react logically and skillfully to developing situations.

6-5.4 Exploitation of the Nuclear Strike.

Since the initial Soviet tactical nuclear strike will probably be an integral part of the offensive plan, the nature of subsequent exploitation is quite predictable. How NATO might exploit a nuclear strike is vague since current doctrine as well as the nature of an initial NATO strike is unpredictable.

It is clear that Soviet exploitation will consist mainly of a very aggressively pursued conventional attack through strike-defined corridors. Chemical strikes on some rear logistics installations can be anticipated not only to immobilize them but to preserve their contents for Pact use. Conceivably, the chemical strike could be conducted as an adjunct to the nuclear strike. The Soviets have a significant airborne capability, and it is logical to predict that it will be used in exploitation to facilitate the advance of the main attacking forces. NATO staffs have long felt that Rhine River crossings, for example, are particularly suitable targets for Soviet airborne attack.

NATO doctrine for the exploitation of nuclear strikes is not explicit. It can only be assumed that exploitation will be conducted in a fashion similar to that prescribed for conventional warfare. Special doctrinal measures designed to recognize the difficulties in successfully exploiting a nuclear strike do not exist. On the one hand, the integrated battlefield may offer some unique opportunities and, on the other, commanders will encounter obstacles of greater magnitude than on the conventional battlefield. Further, NATO exploitation may be limited geographically for political reasons. While some heliborne and airborne resources might be used by NATO in the exploitation, they will not be as abundantly available as counterpart Soviet and Pact resources.

6-5.5 Protection of Troops and Equipment.

A basic principle of Soviet, and thus Pact, operational art is the preservation of the combat effectiveness of troops. In actual practice this principle manifests itself in "combat activeness" - the speed, pacing and timing of the attack, surprise and deception, and making use of dispersal and concealment without detracting from the tempo of operations. Rather than reducing offensive tempo by resorting to low risk protective measures, the Soviets appear prepared to accept a rather high risk of losses to NATO nuclear weapons to preserve that tempo. There are indications in Soviet military literature that the degree of risk, and the preservation of the tempo of operations are very carefully balanced.

U.S. doctrine is largely silent on the protection of troops and equipment on the TNB. FM 100-5 includes a brief dissertation on nuclear weapons effects^{31/} but leaves it to the commander to decide how to cope with them. By seeming to extend conventional protection practices to the TNB, U.S. doctrine appears to assume a greater risk to survivability than does Soviet doctrine.

6-5.6 Summary.

In all aspects of the prospective conduct of the nuclear battle the doctrinal asymmetries favor the Soviet/Pact forces. Table 6 summarizes the U.S./NATO and Soviet/Pact asymmetries related to the conduct of the nuclear battle.

6-6 BATTLE SUPPORT.

6-6.1 Casualty Evacuation and Treatment.

U.S. and Soviet organization and doctrine for normal evacuation and treatment of casualties differ primarily in the quality of medical treatment available in forward combat areas (division level and below) and in medical and transportation resources dedicated to the prompt evacuation of patients to facilities staffed and equipped for required surgery and medical treatment.

Table 6. U.S./NATO-Soviet/Pact Asymmetries
Battle Conduct

Comparison Element	U.S./NATO Forces	Soviet/Pact Forces	Degree of Asymmetry
Nature of Initial Strikes	-Variety of options and selective packages -Adjunct to conventional warplan -High impact of political considerations	-Massive, in depth, comprehensive -Integrated into battle plan -High impact of military considerations	++ for Soviets
Target Acquisition	-Reliance on air reconnaissance, electronic intelligence, sensors radar, long-range patrols -Problems with mobile and silent, concealed targets	-Reliance on air reconnaissance, electronic intelligence, agents long-range patrols and peacetime target lists -Problems with dispersed and mobile nuclear capable artillery	Comparability of means effectiveness but a slight + for Soviets due to immobility of many important NATO targets.
Exploitation of the Strike	-In absence of doctrine, conventional practices will obtain	-Clear and predictable from doctrine	++ for Soviets
Protection of Troops and Equipment	-In absence of doctrine, conventional practices will obtain -Apparent acceptance of high losses	-Stress on "combat activeness" -Risk to survival of some units accepted	+ for Soviets as having more positive doctrine
Command and Control	-Decentralized -High stress on system -Nuclear delivery control superimposed or normal communication system	-Highly centralized -Relatively unstressed system -Dedicated communications for nuclear delivery control	+ for Soviets because of lower degree of stress and more rapid reaction anticipated

In U.S. divisions, doctors are available down to battalion aid station level for emergency life saving treatment. Major emphasis is given to aeromedical evacuation of the seriously wounded to a combat hospital with the required surgical and treatment capabilities. The balance is evacuated in organic ambulances.

In the Soviet ground forces, the medical corpsman of each company and orderlies they have trained, provide emergency first aid treatment and evacuation of casualties to collecting points. Soviet emphasis is on self-help and mutual first aid and minimum treatment through a multi-stage evacuation system from the battlefield to army mobile field hospitals. Surgery is normally not performed below army hospital level even though a physician is available at the Regimental Medical Point. Casualties are evacuated from the lower level medical points by the next higher echelon. The great bulk of the surgical and medical service support is provided by army and Front hospitals. The Soviets rely upon returning supply and combat vehicles to augment their limited number of ambulances. Tactical situation permitting, air evacuation may be employed from division to army and Front hospitals.

A second major asymmetry is in the readiness posture of the two forces for medical support at the outset of hostilities. U.S. medical personnel are well trained, but there is a serious shortage in military physicians to meet hospital staffing requirements in an emergency. The Soviet forces have a ready reserve of medical units. They are periodically mobilized and trained in field exercises.

6-6.2 Essential Resupply and Reconstitution.

A major asymmetry is in the readiness posture of the U.S. supply units in peacetime. The units required to disperse, issue and receive reserve stocks are not in the active forces much less in place in Europe. The Soviets also rely heavily on the reserve forces to provide the logistic support needed in wartime. A peacetime draft, regular training of reserve units, and mobilization exercises give the Soviet a significant advantage in readiness.

A second asymmetry which also impacts on readiness is in doctrinal and organizational change. Major changes in logistic concepts has resulted in turbulence in organizations and procedures. Little attention has been focused on logistical operations on the integrated battlefield. Soviet doctrine and organization enjoys stability and improvement from realistic training.

A third asymmetry is in the supply workload of the U.S. DISCOM and COSCOM compared to the Pact division and army. New logistic concepts will perhaps reduce the degree of this asymmetry. Soviet austerity, supply discipline, combined with delivery forward (versus U.S. mix of supply point and unit distribution) will be an advantage that will be difficult to overcome.

A fourth asymmetry is in reconstitution of forces in combat. U.S. doctrine is lacking at this time. Individual replacement by MOS is still the only replacement means. A system of unit replacement or replacement by weapon system team or crew is under study.^{32/} The Soviet army will use unit replacement from follow-on second echelon or reserves. The edge here in a TNW environment must go to the Soviets.

6-6.3 Essential Maintenance and Decontamination.

Both the U.S. and Soviets stress forward maintenance support. The asymmetry is in the amount of maintenance effort that is concentrated in the U.S. DISCOM and COSCOM. New concepts in the Division 86 and Corps 86 studies should streamline the maintenance load in the U.S. corps and divisions. But at this time doctrine, organization, procedures and training for maintenance support on the highly mobile integrated battlefield strongly favor the Soviets.

A second asymmetry is in decontamination support. U.S. doctrine is available. Units, properly equipped and trained for the effort envisioned on the integrated battlefield do not exist. Training is spotty at best using current assets with damage control teams. The Soviets have the chemical units, doctrine, equipment and regularly train in chemical operations during field exercises.

6-6.4 Communications Support.

Both the U.S. and Soviet forces stress redundancy in command posts and supporting communications. The first asymmetry is in the degree of hardening of initial fixed wartime CP locations.

A second asymmetry is in the degree of hardening of some communications equipment to nuclear weapon secondary effects. The Soviets appear to have greater protection against the effects of EMP.

A third asymmetry is in the area of training and enforcement of communications discipline. This combined with greater use of EW gives the Soviets an advantage.

6-6.5 Summary.

A summary of asymmetries between U.S./NATO and Pact forces is set forth in Table 7.

6-7 SUMMARY OF DOCTRINAL ASYMMETRIES.

6-7.1 Peacetime Preparation.

Systems Mix/Organizational differences involve both warhead yields and delivery systems. The Soviet TNF is predominately a SSM force of fairly high yields, whereas the U.S./NATO TNF is predominately cannon artillery with warheads of lower yield. Overall, the U.S./NATO TNF offers a greater range of warhead yields. When consideration is given to the opposing doctrinal precepts with respect to targeting and type of release the Soviet systems mix and organizational structure are more supportive of Soviet employment doctrine than are the U.S./NATO systems supportive of integrated battlefield doctrine. In the training of these opposing TNF, a substantial asymmetry prevails. Soviet training is comprehensive, intensive and realistic with respect to the planning and conduct of tactical operations in nuclear and chemical environments. U.S./NATO training is narrowly focused on the conduct of selective employment planning, nuclear release procedures, conduct of nuclear

Table 7. Summary of U.S./NATO-Soviet/Pact Asymmetries Battle Support.

Comparison Element	U.S./NATO Forces	Soviet/Pact Forces	Degree of Asymmetry
Medical Treatment and Evacuation	Higher level of medical support but shortage of medical personnel and inadequate training in TNW environment are critical.	Fewer medical resources below Army but soldiers and medical units better trained for survival and handling mass casualties.	+ for Soviets
Essential Resupply & Reconstitution	Peacetime readiness posture poor training and doctrine for operations and reconstitution on TNB lacking.	Resupply structure and procedures streamlined, for better mobility; austerity and supply discipline reduce workload.	++ for Soviets
Essential Maintenance & Decontamination	Support forward concepts stressed, but large maintenance units vulnerable, decontamination doctrine not generally exercised.	Rapid repair forward, fix in place or leave for next level and decontamination practiced in realistic field exercises.	++ for Soviets
Communications Support	Wartime fixed CPs not normally manned, or hardened against direct attack; redundant communications but equipment not protected against EMP; communications discipline not as good as Soviets.	Major commands occupy protected CPs. Redundancy in CPs and communication systems; some equipment better protected against EMP; stress on EW and communications discipline.	+ for Soviets

fire missions, and on actions taken after warning of friendly strikes. Training of commanders, staffs and troops in the field is neither intensive nor realistic regarding the many demands of tactical operations, particularly the support and replacement requirements in nuclear and chemical environments. The inevitable result of this neglect is the inability of U.S./NATO forces to conduct prolonged military operations in these hostile environments. With respect to operational plans, prevailing asymmetries favor the Soviets. Their planning and associated employment doctrine is oriented toward a massive first strike. The Soviets intend it to be decisive. In comparison, U.S./NATO planning is oriented toward selective employment; it is reactive and intended to show restraint. Related to the planning asymmetry, there are also the differences in warning and intelligence. Soviet/Pact forces are well disposed for short warning hostilities, and can conceivably create a marked advantage from launching an unexpected attack against U.S./NATO forces in their highly vulnerable peacetime postures.

6-7.2 Posture After Warning.

Readiness of the opposing forces and target acquisition capabilities is involved here. A readiness asymmetry after warning is inescapable since warning presumes an unambiguous perception of the imminence of a Pact attack. The degree of asymmetry could be very large if, at warning NATO nuclear delivery means and warheads were in peacetime locations, defending forces were not, or only partially, deployed and reinforcing forces had not begun, or were in preliminary stages of movement.

Both sides will have target acquisition difficulties -the Pact in acquiring nuclear capable NATO artillery, NATO in acquiring Soviet nuclear delivery means. We judge the NATO difficulty to be more severe if the warning period is short; but if NATO responds quickly to an early warning the Pact difficulty may be more severe, hence, we judge the asymmetry to be variable.

6-7.3 Nuclear Release.

Asymmetries exist between Soviet and U.S./NATO doctrines regarding the procedures for release, target priorities and the relative timing of

release occurrence. Procedural differences involve both complexity and the nature of release. In conformance with their doctrine the Soviets can be expected to exercise a top-down general release and will do so in an expeditious manner. U.S./NATO forces have a more complicated release chain and accompanying bottoms-up/top-down procedures which are selective release oriented. Comparative target priorities are also different and related to the procedural differences. U.S./NATO selective release employment focuses on committed and second echelon Soviet/Pact forces, whereas Soviet general release employment focuses on U.S./NATO nuclear delivery means and the main groupings of U.S./NATO forces along the major avenues of approach. Finally, with respect to release timing a corresponding asymmetry exists. First U.S./NATO release will probably be deferred until it is clear that the conventional battle is being lost or until the Soviets have first employed tactical nuclear weapons. In contrast, Soviet release can be expected when they consider it to be in their best interest or in response to a selective NATO attack. There is a good possibility the Soviet attack would be preemptive.

6-7.4 Battle Conduct.

In the conduct of the integrated battle we considered asymmetries in the nature of initial nuclear strikes, target acquisition, exploitation of the strike and protection of troops and equipment. The initial strike asymmetry greatly favors the Pact. It is clear that Soviet planning and doctrine is focused almost exclusively on a comprehensive, in depth, first strike while political considerations have dictated a more cautious, less militarily effective approach to a first strike on the part of NATO. The target acquisition asymmetry remains essentially the same as after warning (6-7.2). Soviet exploitation intentions are clear and predictable--a massive armor and mechanized attack with deep objectives. In the absence of a specific doctrine the nature of NATO's exploitation intentions are vague. Both sides are prepared to accept relatively heavy losses. The Soviets rely on "combat activeness" and intensive training for protection of troops and equipment. In the absence of doctrine and vigorous TNW training, the protection of NATO troops and equipment cannot be expected to match that applicable to the Soviet forces. We believe that this asymmetry definitely favors the Soviets.

6-7.5 Battle Support.

With respect to essential combat service support, the opposing forces will be severely challenged in an integrated battlefield environment. However, due to a greater emphasis on training for the tactical nuclear battle and a more austere discipline regarding battle support, the asymmetries favor Soviet/Pact forces in every major respect. Though U.S./NATO forces provide a higher level of support for faster evacuation to surgical facilities, Soviet/Pact forces are better trained for survival and their medical units are better trained for handling mass casualties. With respect to essential resupply and reconstitution Soviet/Pact forces practice an austere supply discipline, stress resupply forward and place training emphasis on the streamlining of their resupply procedures. On the U.S./NATO side, the readiness posture of CSS units is poor. Doctrine and organizations are in a continuing state of change. Both training and doctrine are not adequate for operations on the integrated battlefield. A comparable asymmetry prevails with respect to maintenance and decontamination. The Soviet/Pact forces stress rapid repair forward or leave in place for the next level of maintenance. This doctrine is practiced in realistic field training exercises. Equipment for forward decontamination is found in greater abundance in Soviet/Pact forces than is provided in U.S./NATO forces, and it is used during training exercises.

With respect to communications support, the vulnerabilities to electronic warfare (EW) means and EMP are nearly in balance between the opposing forces. However, Soviet/Pact emphasis on communications discipline, extensive use of EW, a somewhat lesser dependence on electronic communications, and the nuclear hardening of key command posts/communications gear provide the Soviet/Pact forces an advantage in communications support.

VII. DOCTRINAL REQUIREMENTS

7-1 INTRODUCTION.

As the asymmetries analysis indicates, Soviet/Pact forces possess doctrinal advantages in all major aspects of "tactical nuclear" warfighting. Given a war in which the Pact fights in accordance with Soviet nuclear doctrine, the prospect of NATO defeat is somewhere between quite possible and probable. A NATO defeat, however, is unacceptable: NATO's very existence presupposes that. As a matter of urgency, the U.S. and NATO must realistically assess what can be done to improve significantly the readiness of the NATO Corps to fight, survive, and win on the integrated battlefield. The doctrinal requirements suggested here address this purpose.

In battle, troops will do well only what they have been trained to do. This time-worn axiom is particularly relevant to the integrated battlefield. The great destructiveness and severe psychological stresses of tactical nuclear warfare make preparation measures just as important as measures taken in actual combat. For this reason, doctrinal requirements (for combat, combat support and combat service support) are presented in both warfighting and preparatory contexts.

7-2 CONDUCT OF THE TACTICAL NUCLEAR BATTLE.

7-2.1 Tasks.

The first step in the development of the major combat tasks was identification of probable scenarios. Section V details this step. All but one of the likely scenarios envision a nuclear first-strike by the Warsaw Pact. These are the scenarios most dangerous to NATO, with the danger inversely proportional to the amount of preparation time available after warning. NATO's grimmest scenario, of course, is the no-warning or "bolt-out-of-the-blue" Pact nuclear strike.

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Considering these scenario possibilities, and regardless of how well (or poorly) prepared the NATO corps may be, the tasks stated in Table 8, below, must be undertaken if NATO is to survive and win a nuclear conflict.

Table 8

Operational Tasks on the Tactical Nuclear Battlefield

- Locate and neutralize enough Soviet/Pact nuclear delivery systems so as to measurably degrade the intensity of the strike. Ideally, a posture of readiness to preempt the strike by conventional means should be sought.
- In absorbing the nuclear strike, the corps must seek to preserve the capability to contain the Soviet/Pact attacking echelons and interdict succeeding echelons by a combination of nuclear and conventional means to such a degree that corps forces can:
- Complete the defeat of Soviet/Pact forces through exploitation operations and, at least, eject them from NATO territory.

Acceptance of the tasks above as a formula for victory on the integrated battlefield creates requirements: combat, combat support, or combat service support requirements, many that presently do not exist, exist only in part, or exist inappropriately.

7-2.2 Combat and Combat Support (C&CS) Requirements.

C&CS requirements are categorized by the functions they support on the integrated battlefield during the conduct of the nuclear battle. These are:

- Intelligence gathering
- Fusion and assessment of information
- Target acquisition and targeting

- Command and control
- Employment and survival of
 - Maneuver forces
 - Nuclear delivery forces
 - Other organic CS forces
- Tasking of external (to the corps) combat support.

7-2.2.1 Intelligence Gathering. Intelligence and surveillance activities within, and supporting the corps must have the capability to:

- Identify those Soviet/Pact nuclear/chemical delivery means that put the corps at greatest risk;
- Locate, track, and determine the readiness state of those delivery means;
- Determine the composition, disposition, and likely intentions of the Soviet/Pact first echelon against the corps;
- Locate and track second echelon Soviet/Pact forces that are likely to intervene in the corps battle; and
- Provide warning of any kind of attack upon the corps, particularly nuclear strikes.

Clearly, some of these requirements can be satisfied in toto only at the theater level. For example, given an understanding of Soviet doctrine as presented in Section III, significant elements of the corps could be at nuclear risk from threat systems far beyond the corps commander's area of interest (let alone his area of influence). Nonetheless, all of the above requirements must be met: these capabilities in support of the corps must be there. Finally, all of the above capability requirements must be satisfied by

organic corps assets for, AT THE VERY LEAST, complete coverage of the corps' area of influence.

7-2.2.2 Fusion and Assessment of Information. Execution of the major tasks (Table 8) requires that decision-making be more timely and precise than is now possible. For there to be more timeliness and precision, the fusion and assessment process must function within a system that:

- Supplies timely, assessed information which permits commanders and their staffs to formulate real-time and viable operational options
- Is compact and mobile
- Provides for redundancy at alternate command post locations
- Diminishes the size and numbers of the various liaison and support cells now required in command centers to accomplish the information function.

Ideally, the supporting fusion system should be able to directly tap the sources of information that liaison and support cells now represent in command centers. With such capability, these cells could then be sharply reduced or eliminated from already-too-large command posts.

7-2.2.3 Target Acquisition and Targeting. The first task of Table 8, locating and neutralizing Soviet/Pact nuclear delivery, is closely related to the intelligence gathering functions discussed previously (7-2.2.1). This task severely stresses both the NATO target acquisition means and the process which transforms this information into target engagement data. Location of Soviet/Pact systems will be difficult, particularly when they are quietly hiding. Therefore, for the long term, there is a priority requirement for the development of means to track nuclear-capable systems from home station to firing locations. Once Soviet/Pact nuclear systems are acquired, essential target data must be rapidly developed to enable a timely engagement decision.

Acquisition, tracking, and targeting of maneuver forces, artillery, and C³ nodes is the next priority. A requirement exists to improve U.S./NATO acquisition and information-processing systems, particularly the timely production of target data, if the second task of Table 8 is to be effectively accomplished.

7-2.2.4 Command and Control. More flexibility must be introduced into the command and control system of the NATO Corps. With the possibility/probability of Pact employment of "weapons of mass destruction", doctrinal procedures must be developed that can cope with the loss of key nodes in the C³ system. Command center vulnerabilities should be addressed and reduced, and skip-echelon and echelon bypass C³ procedures developed and practiced.* Pact integrated battlefield strikes may well create situations where battalion command posts survive but companies do not, or vice-versa, and so on up the organizational line. Doctrinal procedures to reestablish cohesive units need to be developed if the second and third tasks of Table 8 are to be accomplished.

As these requirements unfold, we recognize that some represent apparent contradictions that balancing judgements must resolve. For example, reduction of command and control center vulnerability involves reduction of its electronic and thermal signatures, and hardening of its sophisticated electronic equipment to nuclear weapons effects, particularly electromagnetic pulse (EMP). Yet, while reducing physical size, equipment for the fusion and assessment of information, such as discussed in 7-2.2.2 above, could well increase vulnerability of command posts unless carefully designed considering all aspects of the integrated battlefield.

*For the purpose of this study these terms are defined as follows: Skip Echelon - processing requests and orders without going through all Command echelons. Skipped echelons are provided with information concerning requests or orders but are not required or expected to staff and modify or comment on them. Skipped echelons may comment when circumstances warrant. Echelon By-pass - processing requests or orders without going through all echelons because some echelon is destroyed, ineffective or out of communication.

7-2.2.5 Employment and Survival of Forces. Requirements in this area must be developed in the truly integrated battlefield context and with the absence of a period of transition from "conventional" to "tactical nuclear" warfare. Therefore, measures for control and survival must be essentially common to all operations, be they conventional, chemical, nuclear, or any combination thereof. This, basically, is the Soviet view: it should also be adopted by the U.S. and NATO. We feel that "mirror-imaging" in this case is totally appropriate and required.

It is probable that some measures for example, appropriate to the nuclear aspects of a conflict will not be necessary on the conventional battlefield, and some may even degrade conventional warfighting effectiveness. Nonetheless, the threat of nuclear/chemical use will so dominate the conventional battlefield, that measures adopted must be applicable to the expected conditions of the integrated battlefield.

Employment and survival requirements vary according to the mission of the force and, in some cases, according to geographical location on the battlefield. Forces with special requirements include:

- Maneuver forces in contact
- Maneuver forces in reserve or not in contact
- Dual capable artillery
- Missile forces
- Army aviation
- Signal forces
- Engineers
- Traffic and refugee control forces

- Medical Systems
- Other combat support and combat service support forces.

7-2.2.5.1 Maneuver forces in Contact. Dispersal is a (if not the) key element in reducing vulnerability to nuclear (or chemical) attack. Dispersal, however, tends to run counter to the principle of mass, creates control and other problems, and can ultimately lead to defeat in detail. Dispersal of forces into small combat groups in the FEBA (for protection from nuclear/chemical strikes) severely handicaps conventional operations, as demonstrated by Exercise Frontier Shield, Hohenfels, West Germany, in 1966.* Coordinating maneuver of the dispersed combat groups (granules) proved to be most difficult, and resupply was awkward at best. Provisional organizational changes were also required, which adversely affected command and control overall. Clearly, there is a need for some compromise in requirements, i.e., dispersal vis-a-vis mass.

Section I suggested that maneuver forces in contact are at less nuclear risk than rearward forces, which further suggests that the balance should lean more towards mass (or a conventional approach) than towards dispersal (reduction of nuclear vulnerability). The nuclear threat along the FEBA, however, cannot be totally discounted. Also, the chemical threat cannot be disregarded (while not treated extensively in this effort, the chemical threat could well be at maximum in the FEBA). Accordingly, intervals between platoons, companies, and battalions should be sufficient to assure survival of a major portion of the FEBA garrison in contact. The optimum intervals, in width and depth, must be determined and prescribed so as to preserve an effective warfighting capability as well. Concerning vulnerability reduction, these determinations should be made in light of published Soviet doctrinal statements which seem to indicate that they are not willing to allocate a large number of nuclear weapons to the FEBA. Still, tactics must be developed that let forces concentrate only briefly, and at the proper time, to defeat penetrations.

*One of the authors, Major General W.R. Kraft (Ret.), observed this exercise.

Additional survivability measures must also be undertaken. In the longer term, these might include providing intrinsic radiation and chemical protection in combat vehicles, more effective collection and dissemination of radiological information, better troop training encountering nuclear weapons effects, and improved individual protective equipment.

7-2.2.5.2 Maneuver Forces in Reserve or not in Contact. Soviet doctrine implies that these forces, particularly those in division and corps rear areas, are at great nuclear risk. Maximum dispersal, much greater than is now normal practice, is required. Rear and lateral boundaries may have to be adjusted (or violated) to accommodate the necessary dispersal of these forces. Command and control and maneuverability may be compromised, particularly in executing rear area security missions, but the adverse impacts of such dispersion can be overcome by adequate training and appropriate doctrinal modification. As these forces displace to execute missions, dispersal should be preserved by utilizing multiple routes and appropriate intervals. Any concentrations must be carefully planned and timed to minimize vulnerability. Intensive training in battle drill procedures will greatly facilitate command and control.

7-2.2.5.3 Dual Capable Artillery. As a nuclear means, this force is at considerable nuclear risk. However, considering the total number of batteries to be attacked, their mobility, and the relatively small targets presented, the risk of conventional attack is probably greater than that of nuclear attack.

A number of survivability enhancement techniques for artillery have been proposed and are under consideration by NATO Armies. For example, LTG David E. Ott, USA-Ret, discusses artillery vulnerability reduction in the March 1980 issue of ARMY magazine. General Ott (a former commander of both VII Corps and the Field Artillery Center) proposes the elimination of battery positions, and instead would disperse single pieces from 2 to 10 kilometers behind the FEBA. These individual guns would also be constantly relocating. For further protection, Ott suggests that some guns, perhaps two or three per battalion, should remain silent during conventional operations and fire only nuclear missions. These concepts, if applied, would present the Soviet/Pact forces with an array of many small and elusive targets that would be most

difficult to detect and engage with any means. While the survey, command and control, fire direction, and mass-fire difficulties of Ott's proposals are clearly recognized, it is urgent that this and other proposals be tested, and those judged most effective on the integrated battlefield be translated into doctrine.

7.2.2.5.4 Missile Forces. At the NATO Corps level, this category currently includes only Lance. Theater nuclear forces are discussed later, and a truly effective Corps Support Weapon System (CSWS) has yet to be fielded. As a nuclear capable system in the Corps area, however, Lance is at great nuclear risk. Lance's dual-capability could also add to that risk, as is discussed below.

When Honest John (HJ) was in both Corps and divisional arsenals, it made sense to permit division commanders to use conventional HJ rounds prior to nuclear release, while Corps' HJ were reserved for nuclear missions. Lance missiles and launchers are fewer in number, however, and probably should be reserved for nuclear fires. While still the subject of active debate, we conclude that the use of conventional Lance rounds, even with immediate relocation, would greatly increase the chances of Lance being acquired, hence making it more vulnerable. Lance is too important to allow it to become vulnerable early in the integrated battle; its range capabilities cover the corps' commanders' area of influence extensively, and its nuclear impact is orders-of-magnitude larger than its conventional firepower. Fielding of a General Support Rocket System (GSRS) would make a decision to withhold Lance (for only nuclear missions) much less debatable.

Meanwhile, a clear doctrine for the employment of Lance does not now exist, and establishing one is a matter of urgency. Lance has a potential role in the first task of Table 8, and an important, if not critical, role in the second task. Neither task can be effectively accomplished, however, unless target acquisition means are improved and timely targeting is possible. The latter must be considered in developing the required Lance doctrine.

Concerning survivability again, dispersion is even more important to Lance than to tube artillery (the Soviet/Pact forces will be looking for Lance

more intensely). While in hide positions, Lance should also be in a firing posture. While Lance must be extremely quiet (minimum electronic signature), relocations must be coordinated to insure that sufficient launchers are ready at all times to execute a corps nuclear strike. With Lance, there is also intense debate about the required movement frequency; the situation of cannon artillery, continuously fulfilling its many conventional roles and hence providing quite a signature, is different. If Lance could stay in one place, quiet and undetected, there would then be no requirement to move. The latter is unlikely, however; movements of the FEBA will require relocation either to be within range of targets or to get out of Soviet/Pact cannon range, Soviet/Pact acquisition may not be realized until too late, and a firing posture may not be attainable. Should Lance hide in towns? Would frequent moves make Lance more acquirable than longer, quiet hides? A clear doctrine must address all of the above.

7-2.2.5.5 Army Aviation. Army aviation has an important role to play in all of the tasks on Table 8, and while not particularly vulnerable as a nuclear target, is highly vulnerable to Soviet/Pact nuclear weapons effects. The equipment of Army aviation is "soft", particularly when flying, and will frequently operate in the vicinity of Soviet/Pact desired-ground-zeros. Techniques to reduce vulnerability in the hazardous nuclear environment must be developed and practiced. Ground activities must be dispersed, concealed, and mobile. Requirements for Army aviation doctrine include:

- Attack of Soviet maneuver forces
- Resupply of nuclear munitions
- Insertion of ADM teams
- Battlefield surveillance and provision of mobile aerial firepower (including economy of force missions)
- Movement of troops such as evaluation, reinforcement, or exploitation missions

- Reconnaissance and damage assessment
- Command and Control.

7-2.2.5.6 Signal Forces. Communications disruptions on the integrated battlefield are likely to be far more severe than those anticipated in conventional conflict. Fixed communications sites in the rear are highly vulnerable and easily targeted. Urgently needed are doctrine and techniques which provide more flexibility, greater redundancy, fewer critical nodes, and diminished vulnerability: all are integrated battlefield requirements not now existing. Soviet doctrine recognizes that communications are critical to effective command and control, particularly of nuclear means, and can be expected to target accordingly. Equipment must be hardened, and signal troops must be trained in defense against nuclear weapons effects, most particularly EMP. Signal forces must also be among those on the integrated battlefield most acutely aware of communications security: signals intelligence (SIGINT) provides key information to the Soviet/Pact acquisition and targeting process. Procedures and doctrine must be developed to drastically reduce the stress on communications systems on the integrated battlefield.

7-2.2.5.7 Engineers. In the U.S. corps, engineer troops would employ the most doubtful asset on the integrated battlefield, the Atomic Demolition Munition (ADM).

The ADM is a near-surface or surface burst nuclear weapon, by its very nature a "dirty" weapon. Quantities of radioactive fallout from extensive ADM use are potentially enormous--quantities large even in comparison to the use of large numbers of air-burst tactical nuclear weapons.

The fallout problem, however, is not the primary reason we characterize the ADM as of dubious value: it is the matter of when nuclear release may reasonably be expected in a future conflict. To function as originally designed, the ADM would be a countermobility weapon employed forward of or just into the FEBA. There are two fatal flaws in this concept. First, unless the Soviet/Pact forces lead with a preemptive nuclear strike

hours before the first Soviet/Pact troops cross the border, release of U.S./NATO nuclear weapons early enough to be employed in the FEBA battle is not anticipated by anyone. Much later uses, which presumes NATO is being conventionally defeated, may be possible as surviving U.S./NATO troops retrograde. One can easily conjure up a good use for a Special ADM (SADM) by the Germans at Remagen in 1945. Such uses, however, tend to be characterized as desperation employment, and historically have only somewhat delayed an already-determined final outcome.

The second fatal flaw in envisioning ADM use as a countermobility weapon in the integrated battle is that of prechambering. For the ADM to be a truly effective countermobility device (unless perhaps against a "no-bypass-possible" bridge), it must go as a near-surface burst, emplaced at depths not currently within the reasonable capability of NATO engineer troops. Surface placement (except against structures, perhaps) results in degraded countermobility effect and dramatically increased fallout. To provide flexibility (an absolute requirement) in actual execution, great numbers of prechambers would have to be established all across the Central Front. The cost and magnitude of such an effort is a moot point: many, if not the majority, of wartime required prechambers would be at now-politically unacceptable locations. So long as deterrence does not fail, no one honestly expects such political constraints to change significantly.

Because of the above factors, we have concluded that ADM use forward of or in the FEBA is not feasible, and that deeper uses are very questionable unless extensive prechambering is accomplished and/or engineer troops are provided the proper equipment for very rapid chambering. We also feel that employment doctrine cannot be critically hinged upon external support (host nation commercial hole digging equipment).

We also recognize that some of the above arguments are passe, in that they have already been accepted and are considered in Group Employment Plans (GEP). We do feel that these considerations do not go far enough; should ADM go the way of Honest John and Davy Crockett? Unless a clear and workable doctrine for the employment of ADMs is developed, the answer may be affirmative.

We suggest, however, that a doctrine that includes an offensive ADM role might be viable. ADM could play an offensive role in completing the second task of Table 8. Engineer (or Special Forces) teams inserted deep into the Soviet/Pact rear with Medium ADM (MADM) or SADM could locate and attack targets that might otherwise not be acquired in a timely fashion. Mobile targets, such as nuclear delivery or logistics units and certainly C³, could be attacked in near-real time by the utilization of stealth and surprise. Insertion and extraction could be accomplished by a variety of organic means.

The ADM is, nonetheless, a nuclear weapon. As such, it is very high indeed on the Soviet/Pact targeting list, and without proper dispersion and concealment could be very vulnerable. If we are uncertain concerning ADM employment, consider the Soviet perspective: their nervousness about, and planning for, "nuclear mines" indicates that special efforts may be undertaken to locate and neutralize ADM.

The doctrinal requirements for engineer forces go far beyond the ADM issue, of course, and the bulk of these forces are not directly connected with ADM employment. The integrated battlefield will present unique challenges to engineer forces. If all of the mobility/countermobility tasks of the conventional battlefield tend to overwhelm available NATO engineer forces, the integrated battlefield certainly will. From the FEBA to very deep in the rear, staggering damage could be encountered. Engineer doctrinal requirements should focus on determining the tasks that will, and will not, be attempted. Priority of accomplishment of those tasks must be determined, and forces must be doctrinally allocated to them.

7-2.2.5.8 Traffic and Refugee Control Forces. The prospect of a conventional conflict between U.S./NATO and Soviet/Pact forces presents enormous problems for traffic and refugee control forces. Impose upon that the integrated battlefield which can extend damage and casualties to civilian populations that would otherwise be largely unscathed, couple with that unquantifiable panic that nuclear/chemical use could unleash, and the problems grow worse. There is a need to seriously visualize the magnitude of this problem, and develop doctrine that realistically copes with it. The requirement is,

obviously, to maintain essential traffic control and minimize interference from refugee flows.

The integrated battlefield roles of military police forces need to be clearly stated, as they compliment engineer forces and the corps movement control center (MCC) of the COSCOM. Doctrine for the field forces must accommodate possible loss of the MCC, while MCC need to more seriously tackle the question of refugee control (if nothing else, U.S. refugee control) in an environment of great damage to virtually all transportation systems. Waterways transportation may be least vulnerable, yet, in this area, tends to be least considered.

The problem of U.S. and dependents of other nations in the theater cannot be ignored in integrated battlefield doctrine. On the U.S. side, execution of Noncombatant Evacuation Order (NEO) is the only clearly defined wartime function of the lean military staffs of USAREUR's community organization. As a military asset of the U.S. corps, a clearer doctrine around the NEO and related questions must be developed.

7-2.2.6 Forces External to the Corps.

7-2.2.6.1 Tactical Air. The tasks of Table 8 cannot be accomplished without the use of tactical air to deliver both nuclear and conventional munitions to support the corps battle plan. Efforts are underway in the Allied Air Forces, Central Europe to provide more effective air support to the corps on the integrated battlefield. These efforts should be used as a basis for developing joint doctrinal measures. Flying in the vicinity of nuclear bursts is extremely hazardous. Measures should be taken to reduce the vulnerability of aircraft, and crews while flying, as well as on base.

7-2.2.6.2 Theater Missile Forces. Pershing, SLBM, air, sea, and ground launched cruise missiles do not now directly support the corps battle. Their intervention may be necessary to strike targets in the corps area of influence. Just as the Soviet Frontal missile forces can be augmented by support from the Strategic Rocket Forces, so should the NATO corps be able to

call upon the NATO theater nuclear forces for support. The artificial screen which has been raised between the corps and these forces needs to be eliminated.

7-2.2.6.3 German Territorial Forces. These forces have capabilities in wartime to provide significant combat support to the U.S. as well as to the German corps. Tasking of the territorial forces by the U.S. corps and divisions has reflected the conventional battle environment rather than that of the integrated battlefield. Reorienting this tasking might be difficult because of reluctance to visualize realistically the requirements which chemical and nuclear operations will create. Nevertheless, reorientation of tasking must take place at all levels of NATO contact with the territorial structure-army group, corps and division.

7-2.3 Combat Service Support Requirements.

7-2.3.1 CSS Tasks. For U.S./NATO forces to be able to survive and fight on the integrated battlefield, the following essential combat service support tasks must be accomplished:

- Evacuation and treatment of casualties
- Replenishment of essential supplies
- Replacement and reconstitution
- Repair, replacement and decontamination of weapons systems.

To the degree these logistic functions cannot be accomplished, the capability of the force to conduct sustained combat operations will be degraded. Serious deficiencies currently exist in the capability of CSS units, as presently organized and trained, to perform the above tasks on an integrated battlefield.

7-2.3.2 Evacuation and Treatment of Casualties. From the outset of hostilities including the employment of chemical and nuclear weapons, normal evacuation and treatment procedures are inappropriate. There is a requirement

to bring medical help to areas where mass casualties have occurred. For this purpose properly trained and equipped medical teams are needed to sort and treat patients in priority to maximize the number of survivors. These teams will require individual protective clothing and equipment to safely function in contaminated areas. Ground ambulances with improved offroad capabilities and greater protection for operators and patients will also be required. Diagnostic means for better estimating radiation dosage levels received by casualties are needed to support triage. For developing new doctrine and techniques, organizational structure of medical field units, and equipment requirements, casualty estimates in a U.S./NATO Soviet/Pact scenario are a first priority consideration.

7-2.3.3 Replenishment of Essential Supplies. This task is comprised of two major sub tasks:

- Requisitioning and supply management
- Storage and distribution.

The discussion that follows addresses replenishment of the essential consumable supplies: ammunition, POL, and subsistence. The replacement of weapons systems is discussed separately as is the manning of these systems.

To insure the rearming and refueling of weapons systems and feeding of crews on the integrated battlefield, replenishment systems must be simple and as "fail safe" as possible. At present the management of ammunition, POL and subsistence is accomplished by manual procedures. However, due to its criticality, cost, and relatively large number of line items, ammunition has been singled out for intensive management supported by automated procedures down to the COSCOM MMC and storage and issue operations at ASP. The theater level system has already been installed in Europe and the Pacific. The requirement is to insure the uninterrupted replenishment of unit basic loads and ASP stocks in the event of the loss of the automated systems. With all of the theater within range of attack, an ability to determine requirements and to respond with these warfighting supplies under the most disruptive conditions is essential.

Doctrine and procedures for the distribution of POL and subsistence have undergone little change over the years. Some changes are required to improve the capability of division CSS elements from the DSA and BSA to provide timely delivery to highly dispersed units at night or during periods of reduced visibility. In addition, bulk fuel storage in corps and division areas is highly vulnerable to loss. This vulnerability can be reduced with more of the fuel contained in mobile storage (tanker trailers, fuel cells on trailers, etc.), and distributed in a throughput, relay system. The guiding principle is that any corps POL stocks on the ground that cannot be used or moved on short notice risk being abandoned or destroyed in place. At the user end, there is a need for a high mobility, multiple point refueling vehicle for the rapid refueling of combat vehicles of the battalions.

Ammunition has a vulnerability similar to POL. The new concept of establishing ammunition transfer points (ATP) in the BSA with high demand items loaded on COSCOM trailers is a move in the right direction. There is also a need for greater dispersion of ASP stocks to the rear of DSA. The same criterion applies: ASP stocks on the ground that cannot be issued or moved on short notice risk being lost. Another requirement is the need to improve the compatibility of ammunition packaging with distribution means, transport and materiel handling equipment (MHE) to facilitate rapid rearming of weapons systems on the battlefield and reduce the present workload of the ASP/ATP. This requirement impacts on rearming systems, MHE, transport vehicles, intermodal transport systems from the firer all the way back to the ammunition production facility.

7-2.3.4 Replacement and Reconstitution. With the possible loss of major portions of a combined arms force to nuclear and chemical weapons in a short time span, a requirement exists for the early reconstitution of affected units. Considering the stress placed on surviving elements and groups of individual replacements arriving in such an environment, rebuilding the combat capability of the organization with replacement units rather than individuals would be more effective. Examples of types of replacement units are tank and mechanized infantry platoons. The numbers and types of replacement platoons to be formed, their control and use in theater prior to assignment and procedures for processing, drawing equipment, and reception and integration in the reconstituted unit need to be addressed.

7-2.3.5 Repair, Replacement, and Decontamination of Weapons Systems. The concept of maintenance forward is not new. It received renewed attention following reviews of heavy combat vehicle losses in the last Arab-Israeli war. It was apparent that more tanks had to be repaired and returned to combat in a matter of hours rather than days for the Israelis to survive the surprise attack. Current doctrine provides for a direct support company in support of each brigade. Contact teams from the DS company organize the forward maintenance support for the combat battalions. These teams can be augmented by personnel and equipment from the headquarters and light equipment company and heavy equipment company of the maintenance battalions. Additional support can also be requested from the COSCOM. The requirement is to determine the organizational mix of skills and equipment and placement of responsibility to get the job done well forward under integrated battlefield conditions. The NATO defensive posture and threat of heavy equipment casualties dictate a review of the present ad hoc augmentation and limited evacuation and repair capability of the forward support maintenance companies. Maintenance floats need to be enlarged and positioned forward.

There is a requirement for an increased decontamination capability in the division (DISCOM) and corps (COSCOM) for the decontamination of personnel, equipment, and facilities. Decontamination teams are required at all medical and maintenance facilities as well as mobile units to assist in reconnaissance and clearance of areas affected by nuclear and chemical weapons. As in the case of the medical teams, special equipment and transport are required for the teams to work safely in affected areas.

7-2.4 Other Combat Support and Combat Service Support Forces.

The above detailed discussions of employment and survival of forces, and related issues, have been by function and have not been intended to be comprehensive. Other forces performing other specific functions are:

- Supply and services forces
- Transportation forces

- Veterinary services
- Personnel and administrative units
- Military intelligence detachments
- Data processing units
- Civilian labor groups, if present
- Aviation intermediate maintenance units
- Facilities engineering forces, if present
- Chaplains.

The above is not just a "complete the laundry list" effort: each function has some unique employment and survival requirements for doctrinal modifications to adapt to the integrated battlefield environment. Facilities engineer fire protection assets should be doctrinally utilized. Veterinarians must be able to determine if possibly chemically/radiologically contaminated subsistence can be safely used. Laundry and bath sections of supply and service units should be tasked to support the decontamination effort. Truck companies must have doctrinally clear priorities in a transportation-shortage environment. Backhaul should augment the medical system. Personnel and administration battalions could have a vital role in unit reconstitutions. Data processing units must hide and be better protected than present practices. Finally, chaplains need to seriously contemplate the ramifications of the integrated battlefield.

7-2.5 Summary.

As a basis for developing requirements for the conduct of tactical nuclear operations on the integrated battlefield, three demanding tasks have been proposed (Table 8). We believe that these tasks provide an overall formula for winning the battle. Inherent in these tasks are doctrinal requirements for corps combat, combat support, and combat service support. A summary of the major requirements proposed is shown in Table 9.

Table 9

Conduct of the Battle
Summary of Major Requirements by Function

Intelligence Gathering.

- Improve Capability to
 - Locate and track Soviet nuclear delivery means and associated command and control apparatus
 - Focus on composition and intentions of attacking echelons
 - Locate and track second echelon forces.
- Provide timely warning of the imminence of a nuclear, chemical or conventional attack

Fusion and Assessment of Information.

- Improve precision and timeliness
- Develop supporting system which will
 - Be compact, mobile and operable in redundant modes
 - Tap sources directly
 - Reduce command center population.

Target Acquisition and Targeting.

- Develop/Improve capability to
 - Acquire Soviet nuclear delivery means, command centers, communications nodes
 - Acquire appropriate attacking and second echelon targets including artillery

Table 9 (cont'd)

- Rapidly develop and disseminate necessary target data.

Command and Control.

- Increase system flexibility by developing
 - Skip echelon, echelon bypass and other flexibility procedures
 - Procedures for battlefield consolidation of decimated battalions and stray companies.
- Reduce vulnerability by
 - Reducing size of command centers
 - Increasing redundancy
 - Hardening or equipment modification to cope with EMP, gamma and neutron radiation.

Control and Survival of Corps Forces.

- - Command requirements for conventional chemical and nuclear warfare, i.e., the integrated battlefield (precludes a transition period).
 - Rigid application of dispersion and other protective measures against a nuclear strike for forces in rear. Lesser degree of application for FEBA forces.
 - Carefully planned and timed concentration of forces when necessary.
- Dual Capable Artillery
 - Dispersion and movement
 - Eliminate battery positions
 - Silent guns dedicated to nuclear fire missions.

Table 9 (cont'd)

- Missile Forces

- Limited or no use of conventional warheads
- Dispersion and movement
- QRA posture in hide positions.

- Army Aviation

- Fill voids on the integrated battlefield by surveillance and aerial (antitank) fire power
- Augment command and control
- Reconnaissance on the integrated battlefield
- Warhead resupply
- Move troops, weapons to critical points
- Develop measures to reduce nuclear radiation hazards to aircraft.

- Engineers

- Develop integrated battlefield task priorities.
- Limited ADM role, if any.

- Military Police

- Develop priorities for refugee and route control tasks peculiar to the integrated battlefield.

Forces External to the Corps.

- TACAIR

- More responsive nuclear support
- Reduce base vulnerability
- Reduce hazards of flying in a nuclear environment

Table 9 (cont'd)

- Better Planning, C².
- Theater Nuclear Forces
 - Increase responsiveness of Pershing, SLBM and cruise missiles to targeting in the corps area of interest.
- German Territorial Forces
 - Develop tasking requirements and priorities peculiar to integrated battlefield
 - Improve coordination.

Combat Service Support.

- Evacuation and Treatment of Casualties
 - Surgical treatment forward
 - Improved capability to estimate radiation dosage
 - Improved off-road capability for ground ambulances.
- Replenishment of Essential Supplies
 - Capability to insure uninterrupted replenishment of unit basic ammunition loads and ASP stocks in event of automated system loss.
 - Improved capability to deliver POL forward to highly dispersed units under adverse conditions.
 - Improved ammunition packaging to facilitate mobility of stocks.
- Replacement and Reconstitution
 - Early reconstitution of units.
 - Revised doctrine for assignment, processing, equipping, reception, and integration of replacement units.

Table 9 (cont'd)

- Repair, Replacement, and Decontamination of Weapons Systems
 - Repair forward
 - Larger maintenance floats forward
 - Expand forward decontamination capability.

7-3 PREPARATION FOR THE TACTICAL NUCLEAR BATTLE.

7-3.1 Introduction.

We view the steps taken in preparation for the battle to be a major influence on the warfighting capabilities which U.S./NATO forces can ultimately realize once the conduct of tactical nuclear operations has begun on an integrated battlefield. Thus the preparatory tasks and requirements which will lead to specification steps must be derived from the Corps tasks stated in Table 8, just as the requirements for conduct of the battle were derived and presented in subsection 7-2. Essentially, the same general set of requirements pertain across three prenuclear states which are before and after warning of hostilities and during any combat operations which precede the use of tactical nuclear weapons by either side. Prior to warning of hostilities, activities pertinent to planning, intelligence gathering, training and support will bear substantially on future warfighting capabilities. Subsequent to warning, additional activities will bear on the effectiveness of U.S./NATO corps. These include the fusion and assessment of information, command and control, and the deployment of forces. Finally, during any combat preceding the employment of battlefield nuclear weapons, target acquisition and targeting, the control and survival of forces, particularly nuclear delivery means, and the tasking of combat support external to the corps will bear on future warfighting capabilities in a tactical nuclear environment. The following paragraphs will deal with the preparatory tasks which derive from the U.S./NATO corps battle tasks, and the ensuing doctrinal requirements.

7-3.2 Preparatory Tasks.

These are subordinate to and supporting of the corps battle tasks stated in Table 8. The first task is to define the doctrine and provide the means for its fulfillment in battle. Secondly, at all command levels operational plans for execution of the doctrine in all the likely scenarios must be prepared and maintained current. Thirdly, to insure that current doctrine remains appropriate and that the associated operational plans are cogent, U.S./NATO forces must maintain a current intelligence picture and

derivative assessment of Soviet/Pact capabilities. Lastly, U.S./NATO forces must conduct training that is fully sufficient to successful application of the doctrine in all likely scenarios. Statements of these four preparatory tasks are contained in Table 10. Essential to the efficacy of the first task are the acceptance by NATO allies of the doctrine defined and supporting military programs among all members of the Atlantic Alliance.

Table 10
Preparatory Tasks for the Tactical Nuclear Battlefield

TASKS

- Define the doctrine for the employment of tactical nuclear weapons on the integrated battlefield and specify the military means essential to its successful implementation.
- At all echelons accomplish comprehensive operational and support planning for execution of the doctrine in all likely scenarios.
- Maintain a current intelligence picture and assessment of Soviet/Pact capabilities. Revise the doctrine and supporting plans accordingly.
- Train the forces sufficiently to assure accomplishment of the Corps Battle Tasks.

7-3.3 Combat and Combat Support Requirements in Preparation for the Battle.

7-3.3.1 Introduction. Consideration of the four preparatory tasks has led us to identify doctrinal requirements pertinent to planning, intelligence gathering, fusion and assessment, control and survival of forces, tasking of external combat support, and training. These requirements will be presented and discussed in the order stated. But first, the intrinsic nature of the first preparatory task (Table 10) requires that we raise and briefly discuss three issues which will be more exhaustively treated in later sections of this report. These issues deal with target priorities, selective employment and the mix of tactical nuclear weapons.

7-3.3.2 Three Key Issues. The first two corps battle tasks emphasize the importance of maintaining an adequate U.S./NATO combat capability in the face of the Soviet theater nuclear threat. While we propose, for this purpose, a capability and readiness posture to locate and neutralize the Soviet TNF sufficiently by conventional means it is nonetheless clear that any substantial remaining Soviet theater nuclear capability would pose the greatest immediate threat to the integrity of NATO's defenses. This circumstance raises the first key issue: Are the U.S./NATO tactical nuclear targeting priorities which place attack of committed forces and the lead elements of second echelon forces ahead of Soviet theater nuclear forces appropriate to the likely scenarios? In Section 6-4 on nuclear release we identified several doctrinal asymmetries. The two most significant pertained to the likely results from a Soviet bolt out of the blue (Scenarios I and IIa) and the questionable efficacy of the selective employment packages in the remaining scenarios including U.S./NATO first use. Following U.S./NATO selective employment a Soviet failure to reach a political decision for cessation of their attack and withdrawal will leave U.S./NATO forces on the horns of the dilemma to continue fighting at a disadvantage or to escalate probably into a strategic nuclear exchange. This plausible circumstance raises the second key issue: Is selective employment of tactical nuclear weapons viable in the face of Soviet theater nuclear capabilities and doctrine? We stated in subsection 6-2.3 that system mixes and organizational structure should support the related doctrinal precepts, and went on to conclude there and in subsection 6-2.6 that the yields and quantities contemplated for selective employment cast doubt on their being recognizable as deliberately constrained selective use and that the doctrinal voids with respect to the ensuing combat cast doubt on their military decisiveness. On this basis we raise a third key issue: Does the current mix of U.S./NATO tactical nuclear weapons support the employment provisos contained in MC14/3?

We have raised these three issues here because their ultimate resolution will bear directly on the discussion of doctrinal requirements which follows. Further, for each doctrinal alternative to be identified later in this report, it will be necessary to establish the associated requirements for targeting, nuclear weapons employment, and weapon systems mix.

7-3.3.3 Planning. Within the limits of nuclear release and selective employment the nuclear planning process today is defined well and is followed closely in the development of contingency based SEP. However, it is largely independent of the overall operational planning process which results in stating the missions, concepts of operation and unit tasks from battalion through corps. In essence, nuclear fire planning today is an activity adjunct to conventional operational planning. In order to realize an integrated planning process some fundamental changes are required:

- First, resolution of the targeting priorities issue is needed. This will necessitate a thorough investigation of the expected effects from alternative targeting priorities across all scenarios; the qualitative asymmetries analysis suggests that a substantially higher combat payoff would result from successful first attack on the Soviet TNF. Such a change may be especially cogent in Scenarios I and IIa, i.e., to accomplish corps task 2 (Table 8) when the U.S./NATO TNF is most vulnerable, requires that U.S./NATO forces be able to launch an immediate and effective disruptive attack. The existing planning process is especially lacking in respect to this requirement.
- Second, concepts of operations from battalion through corps must be related and supporting of one another. The schemes of defense and maneuver, when coupled with the capabilities of the forces involved should point to a high probability of successful execution. Necessary, in planning, to achieving these favorable indications is the inclusion of nuclear fire planning within the total planning process. But, what of the vagaries associated with nuclear release? We suggest the development of a clear detailed conditional release system to supplant the existing selective release system.* Such a change would enable planners at all echelons to include the planned use of nuclear

*Quite possibly, the difficult and challenging effort required to bring about such a politically charged change will substantially raise the perceived nuclear threshold. If so, the U.S./NATO military community will have gained valuable information with respect to its needed military capabilities overall.

fires as part of the total operational concept for those anticipated situations which meet the predetermined conditions. While not all uncertainties would be removed by such a system, they should nevertheless be sufficiently reduced so that integrated battle planning can occur. Implicit in our argument is the assumption that any substantial Soviet preemptive strike would responsively bring about some form of conditional release by U.S./NATO forces. In Section IX of this report, dealing with alternative doctrinal concepts, we will present an overall concept for a U.S./NATO conditional release system.

- Third, on the basis of the target priorities and release system established, there is a requirement to determine the quantities, yields, and delivery means which should comprise the U.S./NATO TNF. The corps tactical nuclear capability must be tailored to meet the anticipated corps requirements responsively, and to the extent possible from its organic assets. However, anticipating an increased emphasis on the importance of effectively neutralizing the Soviet TNF which can attack the corps, we also see a requirement to define the need for nuclear fires from outside the corps and the procedures for their responsive provision. This requirement will be discussed further in subsection 7-3.3.7.

The fulfillment of the foregoing requirements, though not easily accomplished, would alter the U.S./NATO planning process substantially, taking it into the realm of integrated operational planning; something which is sorely needed in our view.

7-3.3.4 Intelligence Gathering. These activities must provide capabilities in two important respects. First, prior to warning of hostilities it is imperative that an objective intelligence effort be continuously undertaken to maintain a current data base on Soviet/Pact theater nuclear capabilities, dispositions and activities of their TNF, and the specifics of their TNW doctrine. A comprehensive effort is required which provides the basis for an accurate assessment of Soviet theater nuclear capabilities and intentions.

Any significant change in either capabilities, plans or doctrine should prompt the review and needed adjustments of U.S./NATO posture, doctrine and plans in fulfillment of preparatory task 3 (Table 10). Second, beginning with warning of hostilities, intelligence activities with and supporting the corps must have the capability to discharge the functions presented previously in subsection 7-2.2.3. In particular, they must provide the capability to track Soviet TNF systems from their home stations to their firing positions. Further discussion of this requirement is presented in paragraph 7-3.3.7.

7-3.3.5 Fusion and Assessment. The concept for an integrated planning process presented in subsection 7-3.3.3 emphasizes the key importance of realizing those capabilities described in subsection 7-2.2.2., which will support development of operational options at each command level. A conditional release system will be demanding in the extreme of accurate real-time assessment of the tactical situations throughout the corps, along with a capability to provide near simultaneous presentation of those assessments at all echelons of command.

7-3.3.6 Control and Survival of Forces. In paragraph 2-3.5 it was noted that sustaining force combat capabilities is dependent on the ability of the forces to survive, maintain effective control and support operations. As amplified there, passive measures alone are very unlikely to result in the needed levels of survivability and control. A variety of both passive and active measures need to be determined and embodied into tactical doctrine to meet the more severe conditions an integrated battlefield will impose. In paragraph 7-2.2.5 the doctrinal requirements were stated from which these measures, i.e., tactics, techniques and procedures as appropriate should be derived. A summary of these requirements is contained in Table 9. Actual development of the measures and their embodiment into doctrine constitutes a major peacetime undertaking which should be a vital and essential part of preparation for the tactical nuclear battle. This suggested undertaking is a doctrinal development program which should consist of both analysis and field testing. On the basis of the doctrinal requirements presented in paragraph 7-2.2.5, consider the following two examples concerned with Lance survivability and the employment of cannon artillery:

- Recently completed analyses^{33/} of Lance survivability suggest that through a combination of deep deployment and frequent displacement Lance can be used in a conventional role with little or no adverse effect on its survivability and subsequent employment in a nuclear role. It is not the purpose of this discussion to disagree with those initial findings. However, we do point out that they are based upon assumptions and data estimates with respect to real-time knowledge of opposing force dispositions, weapon effects and times for movement, firing preparations and target acquisition. Because of the small number of Lance launchers, the comparative conventional/nuclear effectiveness of Lance and the issue of U.S./NATO nuclear target priorities, Lance employment doctrine is of sufficient importance to warrant a rigorous empirical approach to its determination. Doctrinal alternatives for Lance employment need to be field tested under conditions that provide an adequate representation of the driving factors and key interactions affecting Lance survivability and effectiveness.
- Cannon artillery constitutes a significant part of the corps tactical nuclear capability and thereby becomes a high priority target set to Soviet/Pact forces. Current U.S. NATO employment doctrine will present lucrative targets to Soviet/Pact conventional means of attack. LTG Ott's suggestions* on ways to reduce this vulnerability offer a challenging doctrinal alternative. Current combat service support, and C³ capabilities will be severely taxed in the implementation of this alternative. New techniques and possibly more effective support capabilities will be required to achieve a viable doctrine. Once these are defined and developed they should be field tested under conditions which simulate the integrated battlefield and provide adequate measures of their efficacy.

The suggested development program should involve both qualitative and

See paragraph 7-2.2.5.3.

quantitative analyses in the initial development of tactics, techniques and procedures. This study has provided a qualitative analysis leading to definitive statements of doctrinal requirements and alternatives. Programmed extension of this effort will provide a quantitative analysis of selected doctrinal alternatives within the context of the likely combat scenarios. From these results doctrinal means can be determined and field tests designed to obtain needed operational data and to provide the empirical basis for doctrinal evaluations. Nearly all, if not all, of the requirements pertinent to the control and survival of forces, summarized in Table 9, are amenable to the approach described. Some, such as those related to the employment of maneuver forces, dual capable artillery and Lance would be best field tested in Europe. Such testing would necessitate a capability to provide an adequate simulation of the integrated battlefield in controlled two-sided field exercises. A system providing this capability would also be of considerable value in adding realistic conditions to field training exercises. The concept for such a system is presented in paragraph 7-3.3.8 on Training. Subsequent to warning and prior to the initial employment of tactical nuclear weapons by either side, U.S./NATO forces should conduct operations in a posture similar to that which follows tactical nuclear weapon employment, thus reducing any so-called transition period to absolute minimums in both time and scope of activity. There are, however, two doctrinal requirements to fulfill during the period from warning to first employment.

- The initial vulnerabilities of U.S./NATO forces need to be reduced substantially. While some restationing of forces and improved intelligence capabilities can help, it is in the response to warning that U.S./NATO vulnerabilities are most sensitive. Ways to improve U.S./NATO responsiveness must be explored, determined and implemented, practiced in readiness exercises as appropriate and fulfilled without fail upon warning. Likely ways include hardening of combat vehicles, earlier dispersal and deployment, hardening of key command, intelligence and logistics centers, and the increased dispersal of tactical nuclear warheads. It is recognized that these ways are both costly and possess underlying political ramifications; they deserve indepth cost/benefit analyses which go beyond the scope of this effort.

- Tactical nuclear planning and coordination activities must be intensified during this period so that U.S./NATO forces are fully postured and prepared for first use by either side. From the corps perspective these activities will be particularly important regarding external combat support. As pointed out in paragraph 7-2.2.6 the corps must be given the capability to bring timely combat power to bear on those opposing forces, regardless of their location, which can adversely affect corps operations.

7-3.3.7 Tasking of External Combat Support. As just stated above and discussed previously in paragraphs 7-2.2.6 and 7-3.3.3, the corps in accomplishing the operational tasks contained in Table 8 must be given a timely capability to deal effectively with the Soviet/Pact forces which can affect corps operations. Far-reaching doctrinal changes are needed with respect to providing this combat support from assets external to the corps. For example, the efforts currently underway to provide more effective tactical air support to the corps on the integrated battlefield will produce such doctrinal measures. The tactics and techniques resulting will unquestionably impose requirements for command and coordination procedures to cope with a variety of factors, e.g., target priorities, target acquisition, troop safety, collateral damage and deconfliction. Clearly, field testing of these doctrinal means will be required and should be accomplished by the air and ground forces involved in Europe. Similarly, the provision of support to the corps from Pershing, and Pershing II and GLCM, when deployed, will necessitate the development of new doctrinal measures which will require an empirical approach to their determination, sufficient evaluation and implementation.

Subsequent to warning the previous discussions of requirements related to U.S./NATO vulnerabilities, and planning and coordination (presented in paragraph 7-3.3.6 preceding), are equally applicable to tactical air and theater nuclear missile forces. A third requirement involves intelligence and surveillance means. While we have strongly disavowed the concept of a transition period as espoused in previous tactical doctrine we recognize the existence of some warning period and the likelihood of some period of combat during which nuclear weapons are not employed by either side. Acceptance of

the corps operational tasks (Table 8) suggested and the implicit changes in target priorities for the U.S./NATO TNF lead to a doctrinal requirement to maintain a continuous real-time intelligence picture on the Soviet TNF during these periods preceding first use. As pointed out in paragraph 7-2.2.3 U.S./NATO forces must develop and field the capability to track Soviet theater nuclear means from their home stations to their firing positions, and must set intelligence and surveillance priorities which maintain a current and accurate data base on the locations and activities of these systems.

7-3.3.8 Training. Requirements for training have been stated or are implicit throughout the preceding parts of Section VII. They involve a wide range of needed but absent training activities for commanders and staffs, individual soldiers, and units. There is a clear need to establish comprehensive and intensive training programs to satisfy these needs and fulfill the fourth preparatory task (Table 10).

- Training for Officer Students. Throughout the Army school system, training for the integrated battlefield should become mandatory, broader in scope and dynamic as the doctrine develops. Current, largely elective, instruction on nuclear fire planning should be set into the larger context of integrated operational planning (paragraph 7-3.3.3) and made part of core curricula. Added instruction is required to deal with the subjects of operational concepts for all force components, intelligence and fusion, target priorities, the maneuver and survival of forces, target acquisition, essential combat service support and the C² measures related to both organic and external forces, all in a variety of likely combat scenarios. Instructional techniques should include substantive lectures, individual reading and research, seminars conducted by doctrinal experts, scenario oriented map exercises to include controlled war gaming, and examinations.
- Training of Commanders and Staffs. Much recent progress has occurred in this regard with the development and fielding of

training systems which exercise commanders and their staffs in realistic combat settings from battalion through division. However, these worthwhile systems lack adequate representation of tactical nuclear and chemical weaponry along with any capability to portray the associated tactics, techniques and procedures.* Thus the application of these systems misses the complications and challenges which an integrated battlefield will present to them. An imperative requirement exists to enhance the capabilities of these training systems to represent the key aspects of combat in tactical nuclear and chemical warfare environments. An intensive period of doctrinal development is anticipated. Thus, the body of doctrine will be growing and dynamic. During this period a clear need will exist for extension schooling in current doctrine. A responsive system must be designed and instituted which provides commanders and staffs with the current tactical doctrine as it is presented within the Army school system.

- Training of Individual Soldiers. Effective individual performance is vital to successful combat operations. The tactical nuclear and chemical environments will be especially stressful adding to the difficulties of performing essential individual combat tasks. Attendant will be the challenges of both physical and psychological survival. Intensive individual training seems to be mandated. Methods must be sought and found to bring realism and thoroughness to training concerned with individual protective measures, radiological and chemical monitoring, operating over sustained periods in protective gear, individual and equipment decontamination, and individual casualty treatment. We have no pat answers on the psychological survival aspects of the integrated battlefield. Certainly, physical conditioning, discipline and substantial training in

*Even the latest of these systems to enter development, the Army Training Battle Simulator System - Modified (ARTBASS-M), will provide no representation of the integrated battlefield.

the requisite individual skills will have positive effects; beyond this it is recommended that the Surgeon-General and the Army Research Institute intensify research into this important area. Overall, much improved individual training for the integrated battlefield is a major essential; the inchoate methods of the past will simply not suffice.

- Unit Training. At this level the results of all the previous training come together in the crucible which provides the final preparatory ground for combat operations. Thus its effectiveness is in part dependent on the worthiness of the training programs which went before. Unit training effectiveness is further dependent on its intensity, comprehensiveness and realism. Intensity results from providing the time and serious-mindedness to "play the game" which should come from the proper command emphasis. Adequate comprehensiveness has to do with devising unit training programs and exercises which deal with all the training subjects included in the preceding programs. Training realism is a function of exercising within the context of the likely scenarios, adequate control and the means to represent the key factors influencing unit combat effectiveness adequately. The latter presents a very difficult training methods challenge, even for conventional operations. In providing this essential capability for unit field training exercises, the development and fielding of an Integrated Battlefield Training System is recommended. The system envisioned would afford exercise control, combat assessment and phenomena representation capabilities for two-sided free-play field training exercises. The central controller staff for each of the opposing sides would each operate a control headquarters supported by micro or mini-computer based systems fully interfaced with each other. Standard tactical FM communications equipment would be interfaced with the central computers and the unit controllers and umpires by the off-the-shelf interface devices, needed communication relays and remote message

input/output devices. Opposing force dispositions and activities would be kept current via real-time controller inputs. Engagement assessment would occur on a small-unit target basis from inputs provided by the engaging controller (controllers in the case of direct-fire engagements), target dispositions* and postures contained in the data base and appropriate attrition algorithms in the software. Results of engagements would be provided automatically to the controller of the targeted unit who would require the necessary actions prescribed in the exercise rules. Added realism could be provided by interfacing simple field simulators with the system. For example, radiation field simulation devices could be interfaced affording radiation casualty assessments that would track with player unit radiological monitoring performance and response thereto. As the comprehensive laboratory of achieving combat readiness the importance of unit training can not be too greatly emphasized. To be fully effective it must be demanding and meaningful in character. Scenario realism is essential to realizing these characteristics.

7-3.3.9 Summary of Doctrinal Requirements in Preparation for the Battle. In subsection 7-3 a substantial number of doctrinal requirements have been stated and supported. They relate to both the four preparatory tasks and the doctrinal requirements for conduct of the battle which ensued from the three operational tasks. In all, eleven major undertakings are called for in achieving full preparation for the tactical nuclear battle. In summary, they are as follows:

- Resolve the three key doctrinal issues (7-3.3.2) concerned with target priorities, selective employment and weapon system mix. Due to their pervasive nature, recommendations on the resolution of these issues are made in Section IX. On the basis of these recommendations, the doctrinal alternatives for consideration are derived.

*Target disposition discrepancies in the case of two-controller (direct fire) engagements would prompt an automatic query requiring updates from the controllers.

- Develop the doctrine to establish an operational planning process (7-3.3.3) which contains tactical nuclear and chemical fire planning as an integral part.
- In support of developing the processes for integrated operational planning,
 - determine the detailed requirements for a conditional release system and seek approval from U.S. and NATO National Command Authorities, and
 - determine the requirements for combat support from assets external to the corps.
- Place increased emphasis on maintaining a current, complete and accurate peacetime intelligence picture regarding the Soviet TNF (7-3.3.4, 7-3.3.5 and 7-3.3.7). Provide the means to accomplish the foregoing, including the capability for tracking the Soviet TNF from their home stations to their firing positions, subsequent to warning.
- Establish a comprehensive doctrinal development program (7-3.3.6 and 7-3.3.7) to address both the development and evaluation of doctrinal alternatives concerned with intelligence and fusion, target acquisition and targeting, command and control, employment, maneuver, survival and support of corps forces, and the support required from combat support assets external to the corps. Both analysis and field testing activities should be a part of this program.
- Determine and take the required actions to reduce the peacetime vulnerabilities of the U.S./NATO TNF (7-3.3.6) to the extent necessary for preserving an adequate warfighting capability in all likely scenarios.
- Broaden and intensify the core curricula concerned with tactical nuclear and chemical operations throughout the Army school system (7-3.3.8).

- Provide commanders and staff officers in the field with the capability to war game operational plans and capabilities in all likely combat environments (7-3.3.8).
- Broaden and intensify individual training for tactical nuclear and chemical operations in both individual and unit training situations (7-3.3.8).
- Intensify research efforts concerned with psychological survival on the tactical nuclear and chemical battlefields (7-3.3.8).
- Broaden and intensify unit training for operations on the integrated battlefield. Provide the capability to increase the pertinence and realism of unit field training exercises through the development and fielding of an Integrated Battlefield Training System (7-3.3.8)

7-3.4 Combat Service Support Requirements

7-3.4.1 General. With the major doctrinal voids and weaknesses for the conduct of combat service support on the integrated battlefield corrected, continued action will be required to attain an adequate capability and maintain a satisfactory state of readiness. The primary CSS preparatory tasks listed below are derived from those stated in Table 10 for combat and combat support:

- Determine support requirements and acquire the organization and equipment means for mission accomplishment.
- Update vulnerability assessments, CSS plans, and SOPs in light of changing requirements and threat capabilities.
- Train units to accomplish sustained, essential CSS operations on the integrated battlefield at desired levels of proficiency.

The above tasks apply to all CSS units within the corps and theater units supporting the corps. The discussion that follows is again focussed on those essential CSS functions within the corps that are critical for the corps to fight and survive on the integrated battlefield.

7-3.4.2 Medical Support. Current medical units are structured and staffed on the basis of casualty estimates derived from historical experience. Developing estimates of casualties expected in a NATO/PACT conflict on the integrated battlefield is the first necessary step. The loss estimates will drive the development of operational concepts and design of medical units to accomplish the mission. Training tests and exercises will uncover the need for additional changes in organization, equipment, and procedures.

A persistent problem in readiness of medical units, in the past and foreseeable future, is the shortage of doctors in the military services. For handling mass casualties, larger numbers of trained medical personnel will be required than are presently authorized much less on hand. Alternatives to correct these shortages must be addressed.

During peak periods the evacuation of patients to hospitals in the corps rear area and the COMZ will greatly exceed the capabilities of the ambulance units. Utilization of support transport under the control of the Movement Control Centers should be practiced in field exercises.

7-3.4.3 Essential Resupply and Reconstitution. The quantities of supplies in war reserves as presently constituted in Europe and CONUS are based upon estimated consumption rates for a conventional war. Again, as a first step, these estimates should be revised to reflect consumption and loss rates expected on the integrated battlefield. As discussed in Section 7.2 doctrinal voids exist regarding the operation, location and distribution of supplies to dispersed units in the combat zone. In conjunction with the development of these operational concepts support units of the COSCOM and DISCOM will have to be reorganized and equipped to perform these more demanding tasks. Communications capabilities within the DISCOM are already overtaxed. Transport with self-loading and unloading capabilities to handle palletized loads will be required (particularly for Class V). Intensive training will be needed in the conduct of night operations, traffic (convoy) control, rapid and

frequent relocation of supply points, camouflage and communications discipline, use of decoy facilities and existing facilities to conceal command and control as well as support operating locations. Training of small unit support operations must be emphasized for the degree of decentralization that will be required to work. MMC supply control operations will be narrowed in scope, managing by exception supply of those items most critical to the commander in fighting the battle. Training without ADP support should be regularly practiced in field exercises since the centers enjoy ADP support in garrison in peacetime.

Studies^{34/} are underway for developing doctrine for the reconstitution of units that have suffered heavy losses on the integrated battlefield. In the absence of the stress that would be present, realism will be lacking in any set of battle drills and larger scale exercises. Nonetheless, procedures that are simple and clearly understood must be developed and regularly rehearsed.

7-3.4.4 Essential Maintenance and Decontamination. With the doctrinal issues of maintenance operations on the integrated battlefield fully addressed along with the development of revised equipment loss estimates, the required maintenance units need to be forward, trained, and tested. Under the maximum maintenance forward concept there will be a requirement for technicians with higher mechanical diagnostic and repair skills in the forward support contact teams. Such personnel are in short supply now even with the pooling of higher skills (mostly civilianized) in larger maintenance support organizations. This short fall will require early attention and a high priority to be corrected.

Steps have been taken to reacquire a chemical warfare defense capability in the Army following years of neglect - to the point of near extinction. Action has been taken to add decontamination companies to the divisions. For the decontamination missions envisioned within the division and corps areas, however, the units presently are inadequately equipped. Additional units will be required to support corps units and facilities on an area basis as well as back up support of the divisions. The teams will have to be highly mobile, crew protected, and self supporting for missions in contaminated areas.

7-3.4.5 Summary. As tactical doctrine is developed, CSS requirements, operational concepts and means in terms of organization and equipment will become clearer. Survivability of CSS capabilities will continue to be a major consideration. All units face the hard choices of greater dispersion: penalties due to time and distance factors, increased transportation requirements, and command and control difficulties.

Completing the preparatory tasks required to achieve an adequate capability of providing essential CSS will be an iterative process. A series of organizational, equipment and doctrinal modifications will be required. Additional modifications may also be required in tactical operational concepts if induced after intensive training and testing indicate that they cannot be realistically supported. Alternative support concepts will be required for defensive, attack (counterattack), and pursuit operations. In the rapidly changing situations that will be characteristic of the integrated battlefield, the CSS units will have to be organized and trained to react to abrupt shifts in mission and support requirements.

SECTION VIII
U.S./NATO TACTICAL NUCLEAR WARFARE
DOCTRINE: THE ISSUES

8-1 INTRODUCTION.

The predominant issues have been developed from an analysis of the opposing force strengths, weaknesses and asymmetries (described in Sections II, III, IV and VI) as well as from the requirements set forth in Section VII.

There is a fundamental issue upon which all the others depend:

Do the U.S. and its NATO allies have the will and the resources to develop an effective doctrinal base for tactical nuclear warfighting, and to produce the means to support the implementation of the doctrine? U.S. and NATO have not faced this issue squarely in the past. A recent recognition by the U.S. Army of the reality of the integration on the battlefield of nuclear, chemical and conventional operations is, however, a step in the right direction. It provides a useful context in which to resolve other subordinate issues.

Issues generally arise from the apparent advantages which accrue to the Soviets by the existence of doctrinal asymmetries and the requirements judged necessary to reduce these advantages. Since, in the foregoing sections, asymmetries and requirements have been related to the preparation for, conduct of and support to the battle, the issues which we perceive will be presented similarly.

8-2 ISSUES RELATING TO CONDUCT OF THE BATTLE.

8-2.1 Battle Tasks.

The three major tasks described in Table 8 will remain issues until

they are accepted by the military and political authorities of the U.S. and NATO. The focus on Soviet nuclear delivery means is probably the crux of the issue. One could argue against this focus by pointing out that, despite published doctrine, the Soviets may not choose to use nuclear weapons in a Central European conflict, preferring to rely on conventional means. Admittedly this is a possibility; but, as long as Soviet intentions are ambiguous, it seems prudent to keep the vast destructive power of their operational-tactical weapons at the greatest possible risk.

8-2.2 Targeting Priorities.

The issue here stems from that of the tasks above. Table 4 points out the asymmetries which we believe to exist between U.S./NATO and Soviet targeting priorities. The Soviet priorities reflect a positive, cohesive and decisive strategy for winning. On the other hand, U.S./NATO priorities seem reactive and not adaptive to a situation where the Soviets intervene with operational-tactical weapons at the outset of, or early in, a conflict. The issue then is whether U.S./NATO priorities should be revised to better support the battle tasks we have proposed.

8-2.3 Protection of Forces.

We see this issue as one of emphasis. It has been suggested that forward deployed forces are less at nuclear risk than those in the rear. Should less emphasis be placed on protection of forward forces? If NATO has an assured capability to target continually and eliminate Soviet operational-tactical delivery means, can protection of forces against nuclear strikes be de-emphasized? Assuming that prudence will dictate some measures of protection, what form should they take?

8-2.4 Command Control and Communications (C³).

Successful execution of the battlefield tasks proposed raises several C³ issues. Within the corps, command centers are generally far too large, too immobile and the fusion and assessment of information too cumbersome. The communications systems on which the centers depend for

information and for exercising control are too inflexible and too vulnerable. In short, C³ within the corps, as configured today, is ill-suited to the demands of the integrated battlefield. We see the following issues to be addressed in attempting to improve C³:

- What sort of fusion system is necessary to induce timely assessments and decisions at corps, division and brigade?
- Can a fusion system be designed what will reduce command center population and produce information in usable form simultaneously at multiple locations?
- What measures need to be taken to reduce command center signatures and avoid detection?
- What is the better approach to lessening vulnerability - hardening, redundancy, or another approach?
- Will echelon bypass procedures assure better command and control continuity?
- How can the effects of EMP and other forms of radiation be reduced?
- By what means can surviving portions of brigades and, particularly, battalions be reorganized into effective units?
- How can survivability of key communications nodes be enhanced?

8-2.5 Maneuver of Forces.

The maneuver of forces on the integrated battlefield will be difficult but absolutely necessary to carry out the second and third battlefield tasks shown on Table 8. Many factors will inhibit maneuver - physical obstacles, loss of control, equipment and personnel losses etc.

Soviet doctrine embodies a concept called "combat activeness" to assure that the continuity of maneuver is sustained. Should U.S./NATO doctrine include a similar concept? Can a better approach be devised?

8-2.6 Use of Conventional Munitions by Corps Nuclear Delivery Systems.

Two issues arise in this area - use of a Lance conventional warhead and use of conventional rounds for the 8 inch and 155 mm howitzers. Prior to nuclear release targets may be acquired by the corps for which the Lance conventional warhead may be appropriate. In turn, this could increase the vulnerability of the launchers so used. Issue: Under what conditions, if any, should use of the conventional warhead be permitted?

It has been proposed that some 8 inch and/or some 155 mm pieces be silent until nuclear release so as to protect their nuclear capability. Issues: Is this feasible? How many pieces should be involved? Should entire batteries be silent?

8-2.7 Use of ADM.

The many problems associated with ADM employment give rise to questions concerning whether ADM should be used at all, or their use restricted. As a practical matter, because of uncertainties as to the direction of fallout, NATO corps and division commanders will probably be reluctant to use ADM unless they can be chambered sufficiently deep to preclude significant fallout. Issues: Should ADM remain in the nuclear inventory? Alternatively, should their use be limited, and to what extent?

8-2.8 Roles of External (to the Corps) Combat Support.

The external support issues concern the roles of TACAIR of the theater nuclear force (outside the corps) and of the German territorial forces.

The TACAIR issue reflects the difficulties the corps and divisions will encounter in obtaining responsive air support on the integrated

battlefield. Flying in the vicinity of nuclear strikes can be very hazardous. On the other hand, if these hazards can be reduced there is definite role for TACAIR in supporting the nuclear operations of the corps.

Issue: What steps can be taken to make TACAIR more responsive to corps operations on the integrated battlefield?

Theater nuclear forces outside the corps have the capability to service targets within the corps area of influence. Issue: What steps can be taken to make these nuclear delivery means more responsive to corps operations?

German territorial forces are tasked to provide significant support to NATO corps in their rear areas. Present tasking generally reflects the conventional battle. Issues: What additional support can the territorial forces provide to assist corps operations on the integrated battlefield? Will the Federal Republic accept such an expanded role for the territorial forces?

8-3 ISSUES RELATING TO PREPARATION FOR THE BATTLE.

8-3.1 Enhancing U.S./NATO Survivability.

In paragraph 7-3.3.6 the requirement to take substantial measures reducing U.S./NATO vulnerabilities was stated. The survivability issue is characterized by two distinct aspects. First, as discussed in paragraphs 6-2.5 and 6-4.3 the current opposing force postures offer the Soviets an opportunity to alter the TNF balance substantially early in a Central European conflict. Consideration of this opportunity in light of stated Soviet doctrine on target priorities for their TNF has prompted a deep concern on our part regarding scenarios I and IIa. The second aspect has to do with the high importance of sustaining U.S./NATO combat capabilities during conduct of the battle as discussed in paragraphs 2-3.5, 7-2.2.5 and 7-3.3.6. At issue is the willingness of the U.S. and its NATO Allies to commit the resources needed in support of substantially reducing the current vulnerabilities.

8-3.2 Planning Concepts.

The results of our research into the current planning concepts has been expressed in paragraphs 2-3.2, 6-2.5, 6-2.6, 6-4, 7-3.3.2 and 7-3.3.3. The finding reached is distressing; that is, U.S./NATO nuclear release is very likely to occur on a selective basis at a time in the course of battle when its military effectiveness will not be decisive in favor of U.S./NATO forces. At issue is the viability of selective employment of tactical nuclear weapons in the face of Soviet theater nuclear capabilities and doctrine.

8-3.3 Target Acquisition.

The first Corps operational task (Table 8) states the requirement to locate and neutralize Soviet theater nuclear delivery systems. Acceptance of this task strongly supports the proposed change in U.S./NATO target priorities and leads to the requirement stated in paragraphs 7-2.2.3, 7-3.3.4 and 7-3.3.7 to develop and field the target acquisition capability to track the Soviet TNF from home stations to its firing positions. At issue is U.S./NATO willingness to make the technological commitment for developing and fielding the necessary systems. A related issue has to do with the setting of priorities for both national and other military means which possess the needed capabilities.

8-3.4 Weapon Systems Mix.

In the initial phase of this doctrinal assessment and evaluation the weapon systems mix question has been dealt with on an individual system basis, e.g., the requirements for ADM, dual capable artillery (both cannon and missile) and combat support external to the corps. It is recognized that the TNF force structure question must eventually be considered in a more comprehensive way. The choice to deal with individual system requirements has been deliberate on the basis that definition of specific doctrinal alternatives must precede any analysis intended to determine the overall mix of tactical nuclear systems required to pursue corps operations in conformance with a specific doctrine. At issue will be determination of the weapon systems mixes, in terms of both delivery systems and yields, which best fulfill the employment provisos of the respective doctrinal alternatives and
MC 14/3.

8-3.5 Doctrinal Development.

Decades of too little effort with a narrow focus have resulted in substantial doctrinal voids. In paragraphs 7-3.3.6 and 7-3.3.7 the requirement to undertake a concerted doctrinal development program, involving widely scoped analyses and field testing, has been recommended. At issue are the establishment of a coordinated doctrinal development program and the provision of resources to establish and sustain it.

8-3.6 Training.

In paragraph 7-3.3.8 we set forth a number of requirements aimed at amelioration of the large asymmetry which prevails between U.S./NATO and Soviet/Pact training for tactical nuclear operations. The recommended requirements encompass major efforts to broaden and intensify individual training and core curricula within the Army school system, a capability for commanders and staffs to war game the integrated battlefield, increased research into psychological survival on the integrated battlefield, and the development and fielding of an integrated battlefield training system. In all, substantial expenditures and emphasis will be needed in providing effective training. At issue is the provision of resources to effect an order of magnitude improvement in training effectiveness for the integrated battlefield.

SECTION IX

DOCTRINAL ALTERNATIVES FOR U.S./NATO FORCES FOR THE CONDUCT OF TACTICAL NUCLEAR OPERATIONS ON THE INTEGRATED BATTLEFIELD

9-1 INTRODUCTION.

Doctrinal alternatives derive from the

- Basic tasks of the integrated battlefield (Table 8)
- Preparatory tasks (Table 10)
- Issues raised by proposed tasks and requirements (Section VIII).

It was pointed out in Section VIII that our proposed battlefield tasks were at issue since the priority we suggested differs from that which we have deduced from our research and our discussions with commanders and staffs in U.S. Army, Europe (Table 4). Commanders in Europe made clear to us, however, that the priority indicated in Table 4 is not immutable. It reflects a preoccupation with the requirements of Scenario IV (Figure 1) wherein NATO strikes first after a period of conventional conflict. The USAREUR commanders and senior staff officers with whom this subject was discussed felt that the priority would have to be reordered to accommodate to situations presented by other scenarios, i.e., those where it is likely that the Pact will strike first. They were quick to point out, however, that current limitations on target acquisition means constrain the capability to effectively execute the tasks in the priority we suggested. We concur in this assessment, but believe that given the determination to do so, that NATO intelligence gathering and target acquisition capabilities along with procedures for timely targeting can be improved enough to provide a reasonable expectation of accomplishing the tasks we propose.

Differing perceptions of the likelihood of certain scenarios and the degree of danger posed by various potential targets force the issue of task

priority. We found our proposed tasks themselves, however, not to be at issue. Therefore, the doctrinal alternatives suggested in this section address these tasks and their derivative requirements and will accommodate any order of priority.

Doctrinal alternatives will be addressed under the functions they support during the conduct of tactical nuclear operations on the integrated battlefield, as follows:

- Combat and Combat Support Functions
 - Planning
 - Intelligence Gathering
 - Fusion and Assessment of Information
 - Target Acquisition and Targeting
 - Deployment and Survival of Forces
- Combat Service Support Functions
 - Medical Treatment and Evacuation
 - Resupply and Reconstitution
 - Essential Maintenance and Decontamination
 - Communication Support.

9-2 COMBAT AND COMBAT SUPPORT FUNCTIONS.

9-2.1 Planning.

In paragraph 7-3.3.3 the requirement was identified to revamp the existing planning process substantially through integration of tactical nuclear fire planning into the overall operational planning process. It is recognized that much effort has been directed recently by U.S./NATO planners toward this end. We agree with the purpose of these efforts, particularly in regard to the positive effect on the relative timing of nuclear release and the ensuing operational results that are intended. We consider it critical that the fulfillment of these intentions brings about a first U.S./NATO employment of tactical nuclear weapons that is both timed and targeted to

alter the relative combat capabilities of the opposing forces substantially in favor of U.S./NATO forces. Both political and strategic factors which the U.S./NATO National Command Authorities (NCA) must responsibly consider pose egregious effects on the likelihood of a first U.S./NATO employment that is so characterized, under planning which derives from a bottom-up selective release system. As an alternative, we recommend a top-down conditional release system. It is not being proposed that military commanders be given a priori release authority. However, it is proposed that the detailed conditions for release and the associated employment plans be established and approved by U.S./NATO NCA a priori. Coupled with this proposed change would be the necessity to provide the National Command Center with the wartime capability to assess the tactical situation regarding release conditions in near real time. While we harbor no illusions with respect to the attendant difficulties of accomplishing such planning, two and possibly three significantly positive effects would result from succeeding in such an endeavor.

- First, a clearer picture would be provided with respect to the overall force structure requirements of U.S./NATO forces on the basis of more precisely establishing the tactical nuclear threshold from a U.S./NATO view.
- Second, at all levels tactical nuclear planning could be integrated into operational plans on the basis of the established conditions and employment provisos.
- Third, the perception on the part of the Soviets of a bona fide U.S./NATO tactical nuclear warfighting capability could serve as a far more credible deterrent to war in Central Europe than any other steps the Atlantic Alliance might undertake.

9-2.2 Intelligence Gathering.

We see the doctrinal alternatives for carrying out this function in terms of the reliance placed on the various means available to gather intelligence:

- Signal intelligence gathered via air platforms and ground stations.
- Human intelligence gathered from agents, long range patrols, prisoners captured in the enemy rear and defectors.
- Surveillance means including various types of photography from manned and unmanned platforms, direct observation by aircraft crews and ground and air sensor systems.

As primary means all of the above have shortcomings and vulnerabilities. We suggest, therefore, that the preferred alternative should not place primary reliance on any of these means, but rather on a doctrine of coordinated targeting of all of them.

9-2.3 Fusion and Assessment of Information.

Doctrinal alternatives for the fusion and assessment of information are addressed in the context of the structure of the system(s) within the corps for handling information from external sources. Corps division and brigade level command centers will always need the capability to fuse and assess information gathered internally. We see the following alternatives for processing external information.

- Central facility at corps main, feeding essential information to alternate and subordinate command centers.
- Independent facilities at corps, division and possibly brigade, feeding essential information to alternates and other centers.
- Central facility at a hardened army group command center feeding essential information to command centers within the corps.

The second alternative facilitates application of skip echelon procedures and provides redundancy, but is expensive in resources and would

probably tend to inflate the size of command centers, enhancing signatures and reducing mobility. The first alternative presents a very vulnerable system since it is hardly feasible to consider tying corps main to hardened sites. The third alternative is attractive from the stand point of survivability and could conceivably contribute to application of skip echelon procedures and to trimming the size of command centers within the corps.

9-2.4 Targeting Acquisition and Targeting.

9-2.4.1 Target Acquisition. Target acquisition alternatives are similar to those presented for the gathering of intelligence in 9-2.1, above. Most means cited for gathering intelligence are also useful in acquiring targets. We believe that the only prudent alternative is the coordinated targeting of multiple means.

9-2.4.2 Targeting. There are two aspects to nuclear targeting, its relationship to operational planning and the procedures used for the definition at assignment of targets to fire delivery means. With respect to operational planning we have considered two alternatives:

- Continue selective employment package (SEP) planning for nuclear weapons.
- Integrate nuclear fire planning completely into the overall operational plan.

SEP relates best to our Scenario IV (NATO first use after a conventional period) and would permit nuclear fire support to be given selectively to those corps which find themselves "in extremis" after trying to defend conventionally. Damage could be limited and a more politically compatible solution could be proposed to the national command authorities at the time nuclear release is considered. But SEP is not particularly compatible with our Scenario II (Pact first use, both sides deployed) which we consider more likely than IV. We, therefore, favor the second alternative which must, of course, be linked to some form of conditional release.

We suggest three alternative doctrinal procedures for target definition and tasking of nuclear delivery means:

- Centralize target definition and tasking at corp .
- Decentralize these functions to division.
- Decentralize these functions to division for targets within range of division weapons.

We favor the third alternative as being the most responsive to the management of the corps battle provided that there are resources available to form dedicated nuclear fire support cells at corps and divisions.

9-2.5 Command and Control.

The loss of command and control on the integrated battlefield poses a great risk. Because of nuclear or chemical strikes command centers will become inoperative and the battlefield will contain "lost" brigades, battalions and companies. There are several alternatives to reduce the risk of command and control loss within the corps:

- Redundancy of capability to perform essential control functions using multiple, austere and highly mobile command centers at corps, division and brigade levels.
- Reliance on "echelon bypass" procedures where a division, for example, promptly picks up the command of battalions when a brigade command center is lost.
- Reliance on hardening of command centers so that essential personnel and communications can survive nearby nuclear or chemical strikes.
- A combination of all of the above.

We favor a selective application of the last alternative. The possibilities of redundancy at brigade and battalion are limited. Command centers at these levels should operate out of hardened vehicles. Corps and divisions have a greater capability for redundancy but they must be capable of exercising control using limited communications means, i.e., secure HF and FM radios. The skip echelon concept is applicable at all levels. Doctrinal procedures must be established so that command of lost brigades, battalions and companies can be promptly assumed by another parent.

9-2.6 Employment and Survival of Forces.

9-2.6.1 Maneuver Forces in Contact. Current NATO battle plans for the defense of Central Europe envisage the use of cavalry type covering forces as a buffer between the FEBA garrison and Pact forward attacking echelon. By the nature of their mission NATO covering forces would operate dispersed and in depth within the covering zone. Although vulnerable to chemical attack we believe that these covering forces will not present attractive nuclear targets to the Pact and we do not propose alternatives to current doctrine for their deployment assuming, of course, that protective gear against chemical attack is available to them.

Behind the covering zone FEBA forces will be at risk to both chemical and nuclear attack. At the same time they must be prepared to handle conventional attacks as the covering force withdraws. We see the following alternatives for the deployment and protection of the FEBA garrison:

- Disperse in platoon size granules in depth along the FEBA.
- Disperse only to extent necessary to reduce vulnerability to conventional artillery but maintaining a posture suitable to repel conventional attacks.
- Deploy initially as in the first alternative, above, then concentrate deployment to that suggested in the second alternative.

We favor the last alternative. As pointed out in 7-2.5.1 we believe that FEBA forces are less at risk to nuclear attack than those forces farther to the rear. The risk declines as contact with Pact attacking forces becomes imminent. It seems prudent to disperse FEBA forces initially then assume a more concentrated posture as the risk of nuclear attack diminishes.

9-2.6.2 Maneuver Forces in the Rear. Since these forces are at high risk to nuclear attack we see no alternative to prescribing a dispersed deployment. There is a choice, however, between deploying these forces relatively close to the FEBA or deploying them well back in the corps rear. A more forward deployment would facilitate their entry into battle to block or counterattack Pact penetrations. A rearward deployment out of range of FROG and perhaps SCUD and within a thick air defense envelope should reduce their vulnerability. On the other hand, it would be more difficult to maneuver them forward in a timely manner. The choice is difficult. We tend to favor a rearward deployment as the preferred doctrinal approach with a proviso that the corps commander's judgment, as he weighs risks against the requirements of his battle plan, should prevail.

9-2.6.3 Dual Capable Artillery. Both the deployment and employment of dual capable artillery need to be addressed. Although the NATO 155 mm and 8 inch batteries are probably more at risk from conventional air munitions and counter battery fires than from nuclear strikes, the need for dispersion and mobility is not thereby lessened. The dispersal choices are simply stated as being:

- By battery.
- By platoon.
- By gun.

We would opt for the third alternative, fully recognizing the difficulties in realizing the magnitude of resources this entails.

The dedication of certain 155 mm and 8 inch guns to a nuclear mission

is a particularly difficult issue. The NATO corps have a long standing requirement for more conventional artillery support than has been made available to them. On the other hand, there is a good case for dedicated (or silent) guns from the standpoint of survivability and the reliability and accuracy nuclear cannon fires. We believe that the prudent doctrinal alternative is to provide for some dedicated guns and crews. These guns must be carefully deployed in concealed locations and be reasonably assured of adequate fire direction support to execute nuclear missions.

9-2.6.4 Corps Missile Force (Lance). Of all the corps combat support components this force is probably the highest at risk. There is no question that Lance launchers must be dispersed and concealed to assure survivability. Two doctrinal issues, however, arise - Lance deployment options and use of the conventional warhead. During our discussions with commanders in USAREUR we found general agreement that the conventional warhead could be useful and should be available for use in spite of the risk of detection after firing. We believe that the conventional warhead should be authorized for use only in bona fide emergency situations and when sanctioned by the corps commander who is best able to balance the risks at the time.

As to deployment options we found that the two U.S. corps differ, one corps favoring a forward deployment within range of potential targets (and also of hostile nuclear delivery means) and the other corps favoring a rearward, more protected deployment. We favor the former alternative and would prescribe a high state of readiness to launch from these forward positions. We believe that risks involved in forward deployment are more than balanced by those which would be incurred in exposing Lance during a movement to forward firing positions.

9.2.6.5 Army Aviation. Employment options for Army Aviation have been stated in 7-2.2.5.5. The importance of the availability of aviation assets to perform these tasks on the integrated battlefield cannot be overemphasized. In fact, the contribution of aviation may well be the margin between success and defeat; therefore, doctrinal alternatives to assure protection of crews, aircraft, fuel, weapons stores and maintenance facilities must be examined.

Obviously, dispersal of aircraft, while on the ground is necessary but there are limits to dispersal beyond which operational effectiveness can be expected to deteriorate. Currently aviation units tend to disperse within rather small areas near control and support facilities. This is adequate protection against conventional air and artillery attack; but, we suggest that alternatives be developed for a more radical dispersion on the integrated battlefield.

Since flying in the vicinity of nuclear bursts is most hazardous, doctrine for the employment of Army Aviation in this environment needs to be addressed. Grounding of aircraft during strikes may be part of the solution so that the capability can be available after the strikes, when it will be needed the most.

9-2.6.6 Signal Forces. The employment of signal forces within the corps according to current doctrinal precepts induces a high risk of command and control failure on the integrated battlefield. In 7-2.5.6 we stated a number of new requirements for the employment and protection of Signal Forces. Some of these such as hardening and increased redundancy, are somewhat in the "either or" category. An effort to define the doctrinal alternatives to satisfy these requirements needs to be undertaken by the Army.

9-2.6.7 Engineers. In 7-2.5.7 we discussed the factors which inhibit ADM employment. Our staff discussions in USAREUR leads us to believe that the seriousness of these inhibitions is not well appreciated. A detailed study in 1972* of the possibilities for ADM employment in the battle area of the 3rd Armored Division battle area concluded that there were only a few suitable ADM target sites. Moreover, these areas could be denied to an attacker by other means not posing a fallout risk to the defender. Since this division's sector is not unique in its terrain characteristics, we would assume that ADM employment raises problems in other NATO division sectors as well.

The offensive capability of ADM as described in 7-2.5.7 is intriguing and should be further studied. However, unless a good case can be made for

*During the command tenure of Maj. Gen. W. R. Kraft (Ret.), one of the authors.

the development of an offensive capability we believe that the ADM should be retired and the substantial resources it commands be redistributed.

The broader missions of the engineer troops within the corps need to be reviewed, in light of the environment which the integrated battlefield will produce, and doctrinal alternatives need to be developed and assessed. Such a review is beyond the scope of this assessment.

9-2.6.8 Traffic and Refugee Control Forces. In 7-2.5.8 we touched briefly on the magnitude of traffic control problems which the corps could face within and around the integrated battlefield area. Since the denial of routes and the reaction of the civil population cannot be predicted doctrinal alternatives must provide considerable flexibility in the employment of traffic and refugee control forces. These alternatives should provide for the prompt removal of U.S. noncombatants as a high priority, for the close cooperation with civil authorities and territorial forces, and for the development of plans to cope with probable contingencies. It will probably be necessary to direct deploying combat and combat support troops to use cross country routes to prevent traffic stagnation on improved roads.

9-2.6.9 External Combat Support to the Corps.

- TACAIR. Joint doctrine needs to be developed which will define the roles of TACAIR in support of operations on the integrated battlefield. If aircraft hardening against the effects of flying in the vicinity of nuclear bursts is not feasible, some roles likely to involve such flying may have to be eliminated and accomplished in some other way. For example, the close support of troops in contact may have to be sacrificed and the capability to attack hostile missile launchers and nuclear armed aircraft correspondingly enhanced.

- Theater Missile Forces. We previously stated a requirement in 7-2.2.6.2 to explore the capability of theater missile forces to support the corps within the corps area of influence. Joint doctrinal alternatives should be developed to address this capability and provide for the availability of target acquisition means which the corps does not possess currently.
- German Territorial Forces. The development of a combined doctrine prescribing the roles of the territorial forces in an integrated battlefield environment will continue to be hampered by political obstacles. In truth, from a German politician's view it is not at all an attractive subject to be discussed. We believe, however, that it must be pursued in the hope of an ultimate breakthrough.

9-3 COMBAT SERVICE SUPPORT FUNCTIONS.

The existence of serious doctrinal voids in the provision of combat service support to forces on the integrated battlefield makes the development of doctrinal alternatives in this area an urgent task. The functions most in need of scrutiny are the:

- evacuation and treatment of casualties,
- replenishment of essential supplies,
- replacement and reconstitution,
- repair, replacement and decontamination of weapons systems.

Doctrinal alternatives for numerous other combat service support functions also need to be addressed. These include transportation, personnel administration, data processing, aviation maintenance, veterinary service and others. Specific treatment of these functions are beyond the scope of this assessment.

9-3.1 Evacuation and Treatment of Casualties.

We found in our discussions at the division level in USAREUR that there is great concern over current evacuation and treatment procedures which

if followed on the integrated battlefield, will cause a deterioration in casualty survival rates. As an alternative it was suggested that surgical treatment be pushed forward to the vicinity of division clearing stations. This has an added advantage of dispersing, and thereby protecting, surgical treatment resources. We support this suggestion recognizing it is difficult to divide specialty resources and that mobile medical facilities will have to be austere. Linked with forward treatment, we suggest the development of concepts for increased individual protection, more extensive training in first aid to all troops, more mobile field ambulances, and better radiation monitoring devices both for warning and diagnostic purposes.

9-3.2 Replenishment of Essential Supplies.

We found at the corps support and division support levels in USAREUR a perception of potentially great difficulty in performing resupply tasks in a conventional environment and a high risk of a complete breakdown in essential support in the integrated battlefield environment. Doctrinal alternatives should focus on replenishment of POL, ammunition and subsistence, and procedures for reducing the vulnerability of concentrations of these supplies in the rear and moving them forward to locations more accessible to the fighting forces. The resupply elements in the forward areas must be responsive to rapid changes in the tactical situations. Sudden loss of any single supply point should result in only a minor interruption in class V, III and I resupply support.

9-3.3 Replacement and Reconstitution.

In 7-2.3.4 we postulated that entire units (tank and infantry companies, artillery batteries, etc.) would be lost on the integrated battlefield. We also proposed a requirement in 7-2.2.4 that as a quick fix remaining portion of units be absorbed by other parents. This does not eliminate the need to eventually replace lost units and reconstitute battalions and brigades. We suggest that doctrinal alternatives be developed to do this through some form of unit rather than individual replacement.

9-3.4 Repair, Replacement, and Decontamination of Weapons Systems.

We do not believe that current doctrine for the accomplishment of maintenance tasks will work on the integrated battlefield. Commanders and staff officers at the corps and division support levels in USAREUR with whom we discussed this problem seemed to share this apprehension. There is a need, therefore, to develop doctrinal alternatives which will support increased forward repair capabilities and faster replacement of weapons systems. The newly organized divisional decontamination companies operate on a forward concept, now, but resources available do not appear to be adequate to handle the anticipated decontamination load on the integrated battlefield.

SECTION X.

AN ASSESSMENT OF U.S./NATO TACTICAL NUCLEAR WARFARE DOCTRINES: FINDINGS AND CONCLUSIONS

10-1 INTRODUCTION.

The findings and conclusions of this assessment are presented in the context of scenarios, asymmetries in doctrine, doctrinal requirements and alternatives and the issues these raise for U.S. and NATO. Overall, the Soviet/Pact and U.S./NATO have followed different paths in the development of doctrine for the conduct of the preparation for tactical nuclear warfare. The direct and, to them, logical path which the Soviet/Pact development has followed when compared to the more ambiguous path of U.S./NATO leads to significant asymmetries which, with minor exception, appear to give the Soviet/Pact forces substantial advantages on the tactical nuclear and integrated battlefields. This assessment has suggested a number of doctrinal requirements and alternative approaches, the application of which should reduce the advantages now enjoyed by the Soviet/Pact. We recognize that these doctrinal changes or additions will lead to issues which must be resolved. We have stated these issues in Section VIII.

10-2 SCENARIOS.

Tactical nuclear warfare in Europe could result from the playing out of any of a rather large number of scenarios and scenario variations. Presented in Table 1 are those which we consider plausible from our research. During our trip to U.S. Army, Europe, it was evident that emphasis in U.S./NATO planning and training exercises center on Scenario IV (NATO first use after a period of conventional conflict). We are not convinced, however, that Scenario IV is the most likely of those we present. Soviet doctrinal writings and the conduct of Pact exercises lead one to believe that Scenarios II and III are more attractive to the Soviet/Pact when contemplating an

offensive against NATO. Even if the Soviets should eschew at the outset, the use of nuclear weapons, Soviet emphasis on preemption, at all costs, of an impending NATO first strike would seem to diminish the likelihood of Scenario IV. Scenario I (bolt out of the blue) could be characterized as a paranoic reaction on the part of the Soviets to what they might consider an extreme political or military provocation on the part of U.S./NATO. While Scenario I cannot be absolutely ruled out, we believe that the possibility of its occurrence is very remote.

The resources needed to prepare U.S./NATO for a Scenario I nuclear attack would be immense and could hardly be justified considering the unlikelihood of its occurring. The doctrinal requirements, alternatives and issues presented in this assessment, however, are not incompatible with preparing for Scenario I, but they merely address part of the problem.

From a study of Soviet source documents Douglas^{35/} points out that Scenario III (initiation of tactical nuclear warfare by the Soviets after a period of conventional conflict) is possibly a preferred option. We have not been able to find any evidence, however, that the Soviets have renounced Scenario II options in favor of Scenario III. We have concluded, therefore, that the prudent U.S./NATO approach is to develop a doctrine compatible with both scenarios.

10-3 MAJOR ASYMMETRIES.

Asymmetries were determined and assessed between the opposing doctrines on the basis of their impact in five areas of comparison. In accomplishing this qualitative analysis, consideration was given not only to the soundness of the doctrinal precepts, but also to their overall viability as influenced by the means and training sufficiency to implement the doctrines. The analysis encompassed five areas of comparison. Within each of those areas the major asymmetries are summarized here:

- Peacetime Preparation. The asymmetry of greatest impact derives from the training differences. Soviet training is comprehensive,

intensive and realistic with respect to the planning and conduct of tactical operations in nuclear and chemical environments. U.S./NATO training is narrowly focused on the conduct of selective employment planning, nuclear release procedures, conduct of nuclear fire missions, and actions taken after warning of friendly strikes. Training of commanders, staffs and troops in the field is neither intensive nor realistic. The inevitable result will be the inability of U.S./NATO forces to conduct prolonged military operations in these hostile environments. Asymmetries pertinent to intelligence/warning and planning also strongly favor Soviet/Pact forces. In the shorter warning scenarios the intelligence/warning asymmetry is especially pronounced.

- Posture After Warning. The dominant asymmetries here relate to readiness and comparative vulnerabilities. Again, in the shorter warning scenarios the asymmetries are especially pronounced, particularly with respect to the relative vulnerabilities of the opposing TNF.
- Nuclear Release. Procedural differences involve both complexity and the nature of release. In conformance with their doctrine the Soviets can be expected to exercise a top-down general release and will do so in an expeditious manner. U.S./NATO forces have a more complicated release chain and accompanying bottom-up/top-down procedures which are selective release oriented. Comparative target priorities are also different. U.S./NATO selective release employment focuses on committed and second echelon Soviet/Pact forces, whereas Soviet general release employment focuses on U.S./NATO nuclear delivery means and the main groupings of U.S./NATO forces along the major avenues of approach. U.S./NATO release will probably be deferred until it is clear that the conventional battle is being lost or until the Soviets have first employed tactical nuclear weapons. In contrast, Soviet release can be expected under conditions which will be to their distinct operational advantage.

- Battle Conduct. It is clear that Soviet planning and doctrine is focused almost exclusively on a comprehensive, in depth, first strike while political considerations have dictated a more cautious, less militarily effective approach to a first strike on the part of NATO. Soviet exploitation intentions are clear and predictable--a massive armor and mechanized attack with deep objectives. In the absence of a specific doctrine the nature of NATO's exploitation intentions are vague. Both sides are prepared to accept relatively heavy losses. The Soviets rely on "combat activeness" and intensive training for protection of troops and equipment. In the absence of doctrine and vigorous TNW training, the protection of NATO troops and equipment cannot be expected to match that applicable to the Soviet forces.
- Battle Support. Due to a greater emphasis on training for the tactical nuclear battle and a more austere discipline regarding battle support, the asymmetries favor Soviet/Pact forces in every major respect. Although U.S./NATO forces provide a higher level of support for faster evacuation to surgical facilities, Soviet/Pact forces are better trained for survival and their medical units are better trained for handling mass casualties. With respect to essential resupply and reconstitution Soviet/Pact forces, practice an austere supply discipline, stress resupply forward and place training emphasis on the streamlining of their resupply procedures. On the U.S./NATO side, the readiness posture of CSS units is poor. The Soviet/Pact forces stress rapid repair forward or leave in place for the next level of maintenance. This doctrine is practiced in realistic field training exercises. Equipment for forward decontamination is provided to a degree not found in NATO forces, and it is used during training exercises. Soviet/Pact emphasis on communications discipline, extensive use of EW, a somewhat lesser dependence on electronic communications, and the nuclear hardening of key command posts/communications gear provide the Soviet/Pact forces an advantage in communications support.

10-4 PRINCIPAL DOCTRINAL REQUIREMENTS AND ALTERNATIVES.

The doctrinal requirements proposal in Section VII and the alternatives in Section IX address the preparation for and conduct of the tactical nuclear battle as it may occur if the Soviets choose Scenario II or Scenario III. In developing tasks, requirements and alternatives, the authors have been mindful of the reality that the Soviets may well employ chemical weapons along with nuclear weapons to support an offensive against NATO. Although a comprehensive treatment of chemical operations is beyond the scope of this assessment we have nevertheless attempted to assess the obvious impacts of an integrated nuclear/chemical/conventional battlefield environment.

As we developed requirements and alternative doctrinal approaches to cope with the integrated battlefield we found a significant interdependence among the functions we addressed. For example, improvements in target acquisition and targeting depend to a large degree upon improvements in intelligence gathering, fusion and assessment of information and employment and protection of nuclear delivery forces. This leads to the conclusion that U.S./NATO must examine the full spectrum of combat, combat support and combat service support functions as they apply to the integrated battlefield in a balanced way. A plan for improving the performance of one function must necessarily be developed in close coordination with plans to improve the performance of related and dependent functions.

10-5 MAIN ISSUES.

As we developed U.S./NATO doctrinal requirements for tactical nuclear warfare (Section IX) we were confronted by a number of important issues, the resolution of some of which must precede efforts to fulfill these suggested requirements. In fact, the urgency of certain requirements and, in some instances, the existence of a requirement at all depend on how these basic issues are resolved. Other issues which we believe will arise are not as fundamental and concern the approaches taken to meet requirements.

Target priority is a basic issue because its resolution determines how resources are structured and where development efforts need to be focused. We sensed a feeling of ambiguity when discussing target priorities with U.S. Army, Europe. This is not a criticism but rather reflects uncertainty as to what the situation may be prior to and at nuclear release and a recognition of the limitations of target acquisition systems available to the U.S./NATO corps. These corps must live in the present and they tend to view target priorities in terms of the capabilities of currently available acquisition systems. We conclude that, if Soviet/Pact nuclear delivery systems and second echelon forces within the corps area of influence are placed high in priority, acquisition capabilities must be improved to the extent that there will be reasonable assurance that these targets can be serviced in a timely fashion by either conventional or nuclear means.

The second main issue concerns the viability of the selective employment concept. Selective employment should convey a sense of restraint. But, is there any assurance that the Soviets will interpret it as such? Would they not, on the other hand, interpret a selective employment of nuclear weapons as a signal of NATO weakness and indecision? Although the U.S./NATO corps participate in selective employment planning, can they rely on selective employment packages to support battle plans when there is so much uncertainty as to the timing of release? We conclude that from the standpoint of planning and fighting the corps battle selective employment gives little assurance that nuclear firepower will be available when and where needed. A form of conditional release permitting application of nuclear firepower by the corps under specified conditions would permit integration of both nuclear and conventional fires in corps battle plans.

Resolution of the two preceding issues will cause a third to arise. Is the current composition of U.S./NATO tactical nuclear force supportive of the employment provisions contained in MC 14/3 and established doctrinal requirements? Does NATO have the right mix of weapons? Are the weapons in the arsenal appropriately sized by yields? Are there too many (or too few) of certain types? In 1974 Jeffrey Record raised this issue and suggested some alternatives.^{36/} While we do not necessarily subscribe to any of these alternatives we believe they merit consideration in light of the resolution of

the target priority and selective/integrated employment issues and the subsequent development of doctrinal requirements.

Section VIII contains many issues of importance, but of lesser magnitude than those above. We believe that they must be addressed in the context of an overall and coordinated approach to the improvement of the posture of the U.S./NATO corps to conduct tactical nuclear operations on the integrated battlefield.

SECTION XI

METHODOLOGY FOR THE EVALUATION OF U.S./NATO TACTICAL NUCLEAR WARFARE DOCTRINAL ALTERNATIVES FOR THE INTEGRATED BATTLEFIELD

11-1 ALTERNATIVES AND FACTORS FOR EVALUATION.

11-1.1 Purpose.

In Section IX a presentation of the doctrinal alternatives was made in terms of the following functions:

- Planning
- Intelligence Gathering
- Fusion and Assessment of Information
- Target Acquisition and Targeting
- Command and Control
- Employment and Survival of Forces
- Essential Combat Service Support

Within each of these functions, some preferences were indicated on a qualitative basis. The purpose of this section is to structure the alternatives for needed quantitative analysis across the range of likely scenarios.

11-1.2 The Doctrinal Alternatives and Factors for Evaluation.

Five sequential areas of investigation have been identified in providing a problem structure that is amenable to quantitative methods. These efforts are presented below in the order they are planned to occur. The first two deal with doctrinal alternatives whose effects appear to be relatively independent of the succeeding alternatives. Thus, their early investigation provides efficiency to the method of approach.

the remaining three are more likely to interact and as a consequence we anticipate some iterative steps in their accomplishment.

- Survival, control and support of forces. In a small set of war games or simulations the effects of various deployments and related dispersion criteria, alternative C^2 structures and procedures will be measured against the base case. This area of investigation will focus on doctrinal options for the
 - deployment and employment of combat forces in the corps battle area as a function of their vulnerabilities on the integrated battlefield. Combat forces in contact as well as those in reserve, or not in contact, will be considered.
 - command and control of forces in the corps battle area to include size and redundancy of command centers, skip echelon and echelon by pass techniques and reduction of EMP effects.
 - provision of essential combat service support to deployed corps forces with emphasis on Class I, III and V.
- Deployment and employment of selected tactical nuclear means organic to the corps. This area of investigation will focus on doctrinal options for the
 - deployment and employment of CSWS/Lance in support of corps forces and use of its nonnuclear capability
 - qualitative requirements of a corps support weapon system (CSWS) as a follow-on to Lance
 - deployment and employment of ADM to include both defensive and offensive use
- Employment of tactical air (TACAIR) resources in support of corps forces on the integrated battlefield. This area of investigation will focus on doctrinal options for
 - employment of the target acquisition capabilities of TACAIR in support of U.S./NATO corps forces

- use of TACAIR strike capability, both nuclear and nonnuclear in support of U.S./NATO corps forces
 - use of or employment of U.S./NATO corps forces to suppress hostile air defense and otherwise protect TACAIR within and forward of the corps battle area
 - command and control arrangements for the employment and protection of TACAIR participating in the corps battle
- Employment and support of combat forces in exploitation of opportunities created on the integrated battlefield. This area of investigation will focus on doctrinal options for
 - assigned missions
 - combat and essential combat service support during mission execution
 - sustaining the effectiveness of combat elements surviving nuclear/chemical strikes
 - Tactical nuclear weapon systems mix. This last area of investigation will be a requirements analysis to estimate the quantities of delivery systems and weapon yields needed to realize the more viable doctrinal alternatives identified in the preceding analyses.

11-2 ESSENTIAL ELEMENTS OF ANALYSIS (EEA)

A set of EEA has been established for each area of investigation. These define the scope of the planned analyses and are subject to modification as results emerge from the quantitative investigations. These EEA are intended to focus on U.S./NATO corps warfighting capabilities with particular emphasis on the employment of divisional and corps tactical nuclear forces, tactical air forces in support of U.S./NATO corps forces. Relative to the employment doctrine for these forces, particular emphasis is to be placed on force survivability, target acquisition capabilities of the corps and army group, command, control and communications, and provision of essential combat service support.

11-2.1 EEA for Survival, Control and Support of U.S./NATO Corps Forces.

- Based on Soviet doctrine and capabilities and particular U.S./NATO deployments, what are the expected levels of attrition to U.S./NATO forces?
- What survivability measures can be taken by U.S./NATO forces in the short term and in the longer term? What reductions in vulnerability will occur from each of these measures?
- How do commanders control widely dispersed units displacing frequently with more disciplined reliance on electronic equipment?
- What is the impact of delayed and missing situational information on operations at corps and below?
- How many and what types of command posts are required at each echelon?
- What are the relative effects of various echelon bypass techniques on reducing C^2 degradation caused by command center neutralization?
- What are the effects on C^2 of using skip echelon techniques to control selected operations?
- What are the essential daily needs of typical combat support units for Classes I, III and V on the integrated battlefield?
- Given the environment of the integrated battlefield, what are the best ways to reprovision typical units with essential supplies?

11-2.2 EEA for Employment of Selected Tactical Nuclear Means Organic or Habitually Assigned to the U.S./NATO Corps.

Corps Support Weapons Systems (CSWS)/LANCE

- What the qualitative requirements for CSWS beyond the capabilities of Lance?
- What are the trade-offs in terms of vulnerability and responsiveness of deploying CSWS/LANCE
 - forward in the U.S./NATO corps battle area?
 - rearward in the U.S./NATO corps battle area?
 - in hide positions not ready to fire?
 - in hide positions ready to fire?
- What are the trade-offs in terms of vulnerability and responsiveness of employment CSWS/LANCE
 - in nuclear role, only?
 - in dual role?

Atomic Demolition Munition (ADM)

- What are the effects of the corps battle of
 - not employing ADM?
 - limiting ADM employment to deep chambered locations in the U.S./NATO corps rear, assuming execution of chambering only after start of hostilities?
 - employing ADM in an offensive role?

11-2.3 EEA for Employment of Tactical Air Forces (TACAIR) in Support of U.S./NATO Corps Forces on the Integrated Battlefield.

- What contribution can current, programmed and attainable TACAIR target acquisition capabilities make to the conduct of the U.S./NATO corps integrated battle?
- What are the requirements for nuclear/chemical/conventional strikes delivered by TACAIR in the U.S./NATO corps area of influence?

- What are the capabilities of TACAIR for delivering nuclear/chemical/conventional strikes on mobile targets immediately threatening corps maneuver forces?
- What support from corps forces does TACAIR require in the conduct of its reconnaissance (target acquisition) and strike missions?
- How well do the present planning and C² systems respond to corps needs for target acquisition and strike support on the integrated battlefield particularly where significant opportunities to influence the battle may exist for short periods only? What are the effects of viable alternatives to the current system?
- What are the fire support requirements for integration of fire, interservice coordination, C³, and warning?

11-2.4 EEA for Employment of U.S./NATO Corps Forces in Exploitation of Opportunities on the Integrated Battlefield.

- What types of missions should be prescribed for maneuver forces?
- What will be the inhibiting effects of various conditions peculiar to the integrated battlefield such as, dispersion, loss of C², loss of units, obstacles, etc.?
- How can conditions inhibiting the employment of maneuver forces be best overcome?
- What types and levels of combat support are required for the execution of prescribed exploitation missions?
- What levels of Class I, III and V are necessary to sustain execution of prescribed missions? How should these be provided?

11-2.5 EEA for Weapon Systems Mix Required by or to Support the U.S./NATO Corps on the Integrated Battlefield.

- For each viable doctrinal alternative and in each likely scenario:
 - What are the requirements of tactical nuclear strikes in terms of responsiveness, numbers of weapons, accuracies and yields?
 - What delivery systems can respond to these requirements?
 - What attrition to each type delivery system can be expected?
- What support from external assets, particularly TACAIR, should be provided to the U.S./NATO corps in terms of system type, quantities and tactical conditions?
- What are the quantitative requirements for CSWS as a follow-on to Lance?
- What target acquisition systems are required and in what quantities?

11-3 SCENARIOS AND DYNAMIC BATTLE REPRESENTATION

11-3.1 Scenarios.

Current operational plans and doctrinal precepts imply that scenario IV is the base case. Based on current opposing doctrines and capabilities we have judged scenarios IIb, IIc and III as more likely to occur. Scenarios IIb and IIc can occur under circumstances where the Soviets are led to expect a U.S./NATO first strike and elect to preempt. Scenario III can occur under similar circumstances or when the Soviets perceive nuclear employment being needed to maintain the momentum of their attack. While we have assessed scenarios I and IIa to be less likely than IIb, IIc or III, they are very dangerous scenarios from a U.S./NATO perspective due to extant U.S./NATO vulnerabilities and the clear advantages they offer to the Soviets.

11-3.2 Dynamic Battle Representation.

This requirement is a function of the area of investigation (paragraph 11-1.2). Most of the survival EEA can be addressed by an analysis which is supported with a division or corps level simulation model of adequate fidelity. In addressing the control and combat service support EEA we anticipate a war gaming approach supported by the application of relatively simple functional models to gain insight and develop specific concepts aimed at maintaining control of forces and providing essential combat service support. We definitely foresee the ultimate requirement to field test the concepts developed. In dealing with the employment options for Lance and ADM, we anticipate being able to learn a great deal from either combat model or war gaming applications, though ultimately the employment options for missile artillery, and the offensive employment of ADM should also be field tested. Investigation involving tactical nuclear targeting will present the greatest analytic challenge. We foresee a definite need for controlled war gaming at the corps and possibly higher levels. Detailed representation of adequate fidelity must be provided for:

- Planning processes
- Associated C³
- Intelligence and fusion
- Target acquisition
- Target selection
- Tactical maneuver of forces
- Engagement assessments
- Combat service support

From the first three areas of analysis one or a very few viable doctrines will emerge. Review and analysis of the results from the supporting simulations and games should support determination of the mix of delivery system and weapon yields required to support combat operations of U.S./NATO corps over the range of likely scenarios.

11-4 OVERALL METHODOLOGY FLOW AND TASKS

Five major tasks have been identified to accomplish an evaluation of TNW doctrinal alternatives for the integrated battlefield. These tasks are reflected in Figure 3 on the following page.* On the basis of the scenarios, doctrinal alternatives and EEA, a review of appropriate combat models and war games will be conducted. A model or models to be applied will be selected, and the logic and data base modifications necessary to provide adequate representation of the scenarios and doctrinal alternatives specified. Thereafter an analysis plan and appropriate run designs will be developed and reported. Concurrently, the specified model modifications and data base preparations will be accomplished. The specified run designs will be executed, the results reduced and analyzed, and a final report prepared evaluating the doctrinal alternatives investigated.

*Numbers in figure identify the tasks.

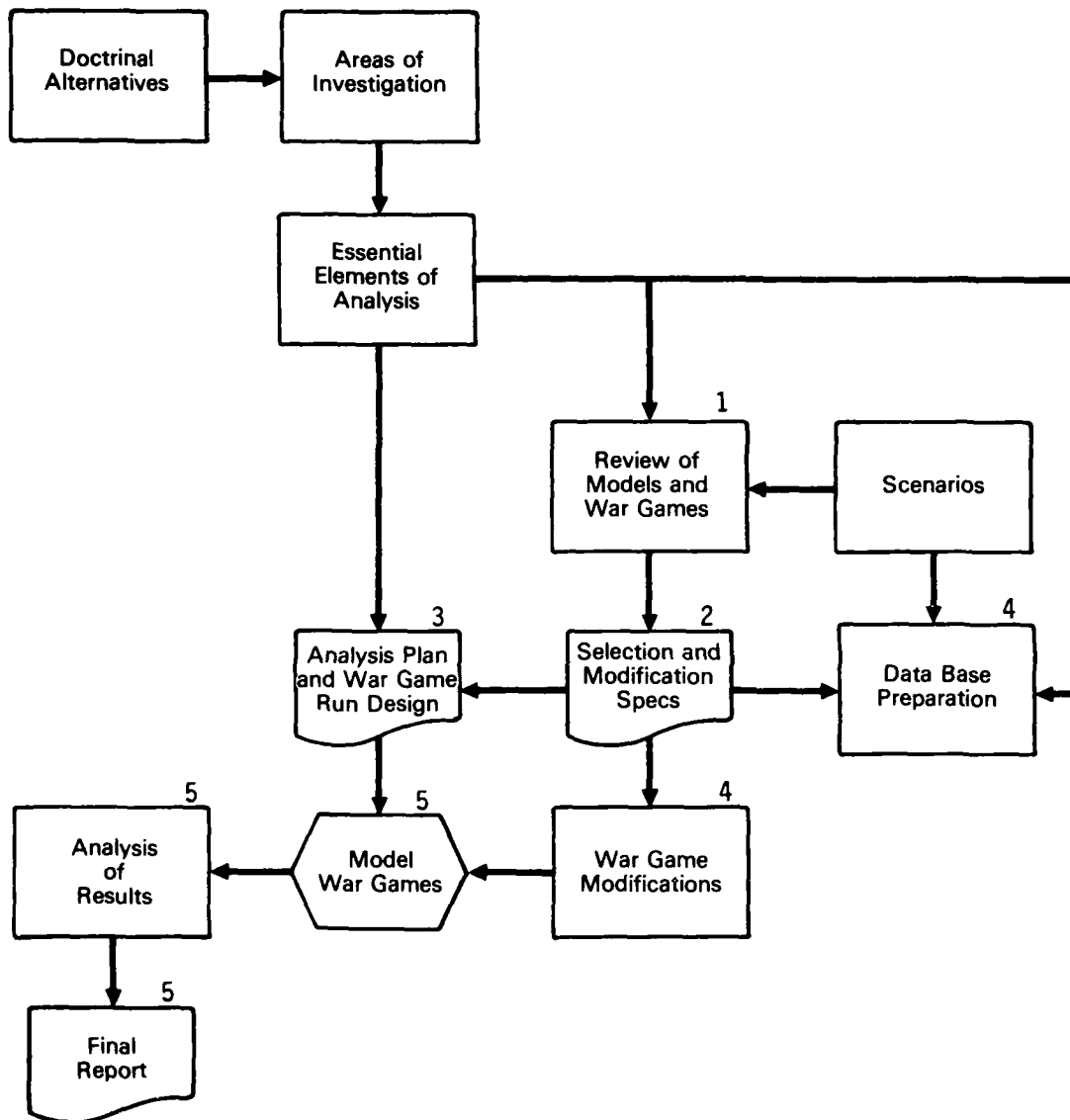


Figure 3. Overall Methodology Flow.

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APPENDIX A

GLOSSARY OF TERMS

ADM	atomic demolition munition(s)
ADP	automatic data processing
ADPE	ADP equipment
AFCENT	Allied Forces Central (Europe)
ALOC	air line of communication
ASO	ammunition supply officer
ASP	ammunition supply point(s)
ATP	ammunition transfer point(s)
BSA	brigade support area
C ²	command and control
C ³	command, control and communications
CEOI	Communications-Electronics Operating Instructions
C&GSC	Command and General Staff College
COMINT	communications intelligence
COMMZ	communications zone
CONUS	Continental United States
COSCOM	corps support command
CP	command post(s)
CSR	controlled supply rate
CS	combat support
CSS	combat service support
CSWS	corps support weapons system
DAO	division ammunition officer
DISCOM	division support command
DMMC	division materiel management center
DMMO	division materiel management officer
DOS	day(s) of supply
DS	direct support

DSA	division support area
DSU	direct support unit(s)
DTO	division transportation officer
ELINT	electronics intelligence
EMP	electromagnetic pulse
EUCOM	European Command (U.S.)
EW	electronic warfare
FASCO	forward area support coordinator
FEBA	forward edge of the battle area
FM	(1) field manual, (2) frequency modulation
FROG	free rocket over ground; Soviet division level nuclear delivery system
FSE	fire support element
FTX	field training exercise
GEP	group employment plan(s)
G-5	assistant chief of staff for civil affairs
GLCM	ground launched cruise missile
GS	general support
GSFC	Group of Soviet Forces, Germany
GSRS	general support rocket system (see MLRS)
GSU	general support unit(s)
G-2	assistant chief of staff for intelligence
HF	high frequency
HJ	Honest John
IR	infra-red
MADAM	medium atomic demolition-munition(s)
MCC	movement control center
MCO	movement control officer
MHE	material handling equipment
MLRS	multiple launch rocket system (see GSRS)

MMC	materiel management center
MOA	method of approach
MSC	major subordinate command(s) (NATO)
MSR	main supply route(s)
MTA	major training area(s)
NATO	North Atlantic Treaty Organization
NATO MC	NATO Military Committee
NCA	national command authority
NEO	noncombatant evacuation order
NUC	nuclear
PLL	prescribed load list
POL	petroleum, oil and lubricants
POW	prisoner(s) of war
PSC	primary subordinate command(s) (NATO)
PTN	Soviet Army technical observation point
QRA	quick reaction alert
RAP	rear area protection
SACEUR	Supreme Allied Commander, Europe (NATO)
SADM	special atomic demolition munition(s)
S&S	supply and service
S&SCo	S&S company
S&T	supply and transport
SASP	special ammunition supply point
SCALEBOARD	Soviet nuclear capable surface-to-surface missile
SCUD	Soviet nuclear capable surface-to-surface missile
SEP	selective employment package(s)
S-4	supply officer
SHAPE	Supreme Headquarters Allied Powers Europe
SIGINT	signals intelligence
SLBM	submarine launched ballistic missile(s)

SOP	standing operating procedure
SSM	surface-to-surface missile
SS-20	Soviet nuclear capable surface-to-surface missile
STANAG	standardization agreement
STAVKA	Headquarters of the Supreme High Command (Soviet)
TA	Theater Army
TACAIR	tactical air (force(s))
TEL	transporter erector launcher
TN	theater nuclear
TNB	tactical nuclear battlefield
TNF	theater nuclear force
TNW	tactical nuclear warfare
TOE	table(s) of organization
TRADOC	Training and Doctrine Command (U.S. Army)
TVD	Teatr Voyennykh Deystviy (Theater of Military Operations-Soviet)
UK	United Kingdom
US	United States
USAREUR	United States Army Europe
USSR	Union of Soviet Socialist Republican
VHF	very high frequency

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Commander-in-Chief, Pacific
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ATTN: RTS-2C
ATTN: DIO-GPF, W. Magathan
ATTN: DT, J. Vorona

Defense Nuclear Agency
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ATTN: STNA
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ATTN: NATA
ATTN: SPTD
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Cameron Station
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Defense Nuclear Agency
2 cy ATTN: FCPR

Field Command
Defense Nuclear Agency
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Field Command
Defense Nuclear Agency
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ATTN: J-5, Nuclear/Chemical Policy Br,
J. Steckler
ATTN: SAGA/SFD
ATTN: J-5, Nuclear Division/Strategy Div
ATTN: J-5, Strategy Division, W. McClain
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Office of the Secretary of Defense
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ATTN: DAMO-SSP, COL Sewall
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U.S. Army Comd & General Staff College

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U.S. Army Materiel Dev & Readiness Cmd

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U.S. Army Missile R&D Command

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U.S. Army Mobility Equip R&D Cmd

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U.S. Army Nuclear & Chemical Agency

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U.S. Army Training and Doctrine Cmd

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Rapid Deployment Joint Task Force
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Tactical Air Command
Department of the Air Force
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Tactical Air Command
Department of the Air Force
ATTN: TAC/DR

Tactical Air Command
Department of the Air Force
ATTN: TAC/INO

Tactical Air Command
Department of the Air Force
ATTN: TAC/SMO-G

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Tactical Air Command
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DEPARTMENT OF THE AIR FORCE (Continued)

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