REPORT OF THE DEFENSE SCIENCE BOARD

September 1958

Report on Limited War
Volume 1

Office of the Under Secretary of Defense
for Acquisition, Technology, and Logistics
Washington, D.C. 20301-3140

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ASSISTANT SECRETARY OF DEFENSE
RESEARCH AND ENGINEERING
WASHINGTON 25, D. C.

24 October 1958

MEMORANDUM FOR

SUBJECT: Defense Science Board Task Group Report on Limited War (DSB 220/3, Volumes I and II, 1 September 1958)

Reference is made to the subject report, copy of which was furnished your office for information. It should be noted that this report is a working paper of the Defense Science Board and that the views, conclusions, and recommendations expressed therein have not received the approval of the Department of Defense. It is requested that this memorandum be inserted in Volume I of the copy of subject report sent to your office.

It is also requested that the report (Volumes I and II) be returned to this office when no longer required.

Paul D. Foote

PAUL D. FOOTE

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DSB 220/3

VOLUME I

FINAL REPORT OF THE TASK GROUP ON LIMITED WAR

DEFENSE SCIENCE BOARD

Office of the Assistant Secretary of Defense
Research and Engineering
Washington 25, D. C.

1 September 1958

Members of Task Group:

L. Eugene Root
Leslie E. Simon, Maj. Gen., USA (Ret.)
L. T. E. Thompson, Chairman
Warren E. Thomson, Secretary

For the Task Group:

L. T. E. Thompson

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OFFICE OF THE ASSISTANT SECRETARY OF DEFENSE
Washington 25, D. C.

Research and Engineering

MEMORANDUM FOR DR. H. P. ROBERTSON,
CHAIRMAN OF THE DEFENSE SCIENCE BOARD

SUBJECT: Report of the Defense Science Board Task Group on Limited War

Reference: (a) Minutes of Defense Science Board Meeting of 19 December 1957

This memorandum transmits the final report of the DSB Task Group established at the sixth meeting of the Board. It presents a series of recommendations, based on the evidence available to the Group, that may serve as guidelines for research and development planning to improve our national limited-war capability. In accordance with our understanding of the terms of our charter, the recommendations are restricted to matters falling within the area of responsibility of the Assistant Secretary of Defense (Research and Engineering).

In the course of our investigation of the limited-war problem, however, we formed strong opinions concerning the desirability of taking certain actions that are within the provinces of other divisions within the Department of Defense or other sections of the Executive Branch. One such opinion is that two additional major force systems should be set up to assure national survival. These are: A mobile Limited-War Force System, organized and operated as a national task force, with elements furnished as needed and without reservation to a central management by the several parts of the Department of Defense; a Cold-War Force System, organized and operated along lines already well demonstrated by small teams of OSO elements in the DOD and its Departments. An expansion of the latter activities to provide a global program is needed.

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The work has proceeded under the usual concept of limited war which admits only those military operations that do not involve a major direct conflict between the primary world powers. General war is thus defined for this reference as that different situation in which the primary world powers are in direct military conflict with each other--their full arsenals used or usable without restriction in an all-out struggle for survival.

Respectfully submitted for
the Task Group,

L. T. E. Thompson

L. Eugene Root
Leslie E. Simon, Maj. Gen., USA (Ret.)
L. T. E. Thompson, Chairman
Warren E. Thomson, Secretary

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I. INTRODUCTION

When the Task Group on Limited War was formed by the Defense Science Board at its December, 1957, meeting, the Group was asked to consider the existing state of technical information bearing on limited warfare with:

1. An initial objective of recommending the best next step needed to stimulate the establishment of a national program, keeping in mind

2. The ultimate objective of formulating guidelines for research and development planning.

We decided to take no action on the first objective, having found that a national study under joint JCS-State auspices was already under way, and have concentrated primarily on determining what the broad outlines of a research and development program for improving our limited war capabilities should be, according to the best available existing information.

In order to develop a frame of reference for research and development requirements in this area, it was considered appropriate to review:

1. Estimates of the probability of occurrences and probable nature of future limited wars;

2. Present and near-future U. S. limited war capabilities;

3. Probable military needs for future limited wars; and

4. The potentials of various technical areas for producing weapons and equipment to meet these needs.

This information was derived from a wide variety of sources, prominent among which were operations research studies by WSEG, RAND, ORO, OEG, NAVWAG, and other groups; special studies made at our request by DOD consultants and the Chemical Corps, USA; published and unpublished reports, articles, and memoranda on germane subjects; and discussions with individuals whose experience, training, and knowledge made their opinions worthy of careful consideration. Very substantial information benefits were gained from the participation of our chairman in the NAS-ARDC Summer Study at Woods Hole,

Massachusetts, and from his attendance at some of the sessions of the BRL Summer Study in Damariscotta, Maine; it has not been possible to incorporate the final results of these studies in this report, since it was written while they were still in progress, but many of their preliminary findings have been considered.

Our conclusions, with indications of our reasoning in forming them, are presented in section II of this volume. Our recommendations are given in section III. A discussion of pertinent material is contained in section IV; section V contains a bibliography and a chronicle of Task Group meetings. Volume II of this report, separately bound, contains in part or in full the reports of special working groups. It is planned to prepare for later publication a Volume III that will contain a miscellany of source material and other information.

II. CONCLUSIONS

1. Ability to Deal Successfully with Limited Wars is Vital to the National Security.

Although all-out nuclear war with Russia is an ever-present danger against which we must be continually prepared, various forms of limited war--by which we mean wars that do not involve a direct attack by either Russia or the United States on the other's homeland--are the most likely future U. S. military operations. Failure to achieve a satisfactory conclusion in any limited war might seriously reduce our prestige and influence; a series of such failures in successive wars could be disastrous, threatening our national survival.

2. Complete Reliance on the Use of Nuclear Weapons in Limited Wars is too Narrow a Policy.

The minimum objective of U. S. foreign policy is to keep presently friendly or neutral countries from joining the Communist Bloc. Limited wars will be fought, if necessary, to attain this objective. Though it is important to cope successfully with any limited war, it is just as important to make sure that the means used to do so in one country do not persuade another that it would be better off to give in to the Communists. Use of nuclear weapons in a limited war may result in conspicuous devastation of the country being defended, either from our weapons or from those used in retaliation against us. There would also be a serious risk that a nuclear war, once started, would spread into a world conflict. The decision as to the military use of nuclear weapons has to be based mainly upon such political considerations. In addition, there are some important forms of limited war, such as guerrilla operations, in which nuclear weapons appear to be of little value.

3. We are not Now Prepared to Fight Foreseeable Limited Wars without Nuclear Weapons.

Using only the non-nuclear weapons now available for issue, air and naval forces could not be depended on to establish a favorable conclusion for most limited wars now foreseeable; great improvements in their armament and, in addition, substantial ground forces with new and effective equipment, or smaller ones of extraordinary mobility so equipped, will be needed. There are possible exceptions, of which the defense of Formosa and war in the Middle East against organized forces are examples. Speed of commitment of

ground forces would have an important effect on the duration and perhaps the outcome of a war. We do not have large ground forces available; those forces we have do not possess great tactical mobility. Further, we cannot move even existing forces rapidly for any distance; for example, the movement of 13,000 men to Lebanon (primarily from nearby bases) took almost two weeks.

4. Changed R&D Emphasis Would Increase Limited-War Capabilities.

Substantial advances in weapons, transport, combat support aircraft, intelligence collection, surveillance, reconnaissance, communications, and combat control--the major deficiencies in our limited-war capabilities--appear possible at reasonable cost. It is plain that the Services, now preoccupied with general war deterrence, will be reluctant to reorient their current R&D programs to emphasize equipment intended primarily or solely for limited war. Further, it is doubtful that an increase in R&D funds would be applied to limited-war projects unless it were specifically designated for such use. The current R&D program does not sufficiently emphasize them.

5. We Can Afford a Limited-War Capability.

Lack of support for the establishment of a limited war capability is hardly justified on the grounds that the country cannot afford it. We believe that the total program required for all force systems can be handled within a budget of the present order provided there is proper use of exploratory techniques before identifying adequate (not heavily redundant) hardware objectives. In any case, the cost of not having an adequate capability may be incalculably great.

6. Limited-War R&D Needs Continuing Over-All Attention.

An R&D program for limited war, if established now, would inevitably develop gaps as concepts and capabilities changed. If the projects in the program were merely divided among the technical offices of the OASD(R&E), very possibly these gaps would not be recognized. In addition, it is difficult for a technical office to determine whether the projects within its cognizance are receiving proper emphasis in relation to their importance in the development of an over-all war capability. Only a Deputy Assistant Secretary of Defense (R&E) or organization concerned with study of the whole problem could supply the proper guidance to the technical offices and to the Assistant Secretary of Defense (R&E) to insure a continuing adequate limited-war program.

III. RECOMMENDATIONS

A. With Respect to Management Actions

1. Responsibility for over-all administration of the limited-war R&D program should be assigned to a Deputy ASD(R&E) for Limited War charged with:

(a) Making recommendations to the ASD(R&E) regarding the level of support for the program;

(b) Referring projects to appropriate technical offices for coordination and technical evaluation;

(c) Initiating desirable studies;

(d) Constant examination of the program to assure that it approaches its objectives as rapidly and completely as possible.

2. Pending the appointment of the Deputy ASD(R&E) for Limited War, performance of his duties should be made an interim and immediate responsibility of the Office of Planning, OASD(R&E).

3. The Deputy should be supported by a permanent advisory group, competent in operations research, whose function would be to analyze, interpret, and integrate the findings of current operational studies in the limited-war area.

4. Steps should be taken to insure that the development of any major end item in the recommended program will not be started until exploratory work on its components has produced clear evidence that they will perform as desired and an evaluation from an over-all system point of view has indicated that the item will be useful at the time that it can realistically be expected to be in service. This philosophy of operation should be extended to cover the entire future R&D program as well as reviews of current work.

5. To secure proper support in the military Departments, action should be taken to insure that adequate funds are allocated to them for the specific purpose of implementing the recommendations that follow.

B. With Respect to the Limited-War R&D Program

In certain areas, the potential of existing programs should be exploited by additional effort:

1. A manned V/STOL aircraft, designed specifically for the all-weather reconnaissance-strike mission against small targets (such as trucks) and operable either from carriers or from unprepared land bases, should be developed. The development should include the sensing and armament components of the system.

2. The development of land- and sea-based drone systems for tactical reconnaissance, with the associated data processing equipment required, should be accelerated. The possible use of satellites in this application should be studied.

3. Current indications of potential improvements in reconnaissance techniques should be vigorously pursued to secure major advances in the areas of all-weather sensing, higher resolution, data processing and display, and methods of mapping.

4. Operational testing of optimum fragmentation weapons should be initiated, and the possibility of applying this principle to weapons useful against personnel within lightly armored vehicles should be thoroughly investigated.

5. Increased emphasis should be given to nuclear weapons potentially applicable to limited wars. Very high priority should be given to the development of extremely clean thermonuclear weapons.

6. Continued emphasis should be given to the achievement of high delivery accuracy in weapon systems in order to make effective use of conventional warheads and to minimize effects of nuclear weapons against friendly forces and noncombatants. Methods of forward control, terminal homing, and map matching should be exploited.

7. Communications equipment for forward-area groups should be redesigned to achieve the best compromise between an adequate, reliable system and the extremely complex network tie-ins now being planned for field army communications.

8. The feasibility of a transport system based upon large (5-600,000-pound) land- and seaplanes should be determined. If either of these proves to be desirable, a prototype aircraft and its associated loading and unloading equipment should be developed.

9. A prototype V/STOL assault transport to achieve adequate mobility between rear bases and the combat zone should be developed.

10. An adequate program should be instituted for the development of landing craft and associated equipment for logistic operations.

11. Development of countermeasures for beach mines should be pressed.

12. The need for research and development on equipment in support of special operations should be investigated; it appears possible that this work is presently handicapped by an extreme security blanket.

In certain areas, either because the promise of existing approaches is low or because little effort has been expended to date, the need is primarily for expanded exploratory research activity:

1. Biological and chemical warfare research should be immediately expanded to the maximum feasible degree to find operationally effective non-lethal agents. Effort should then be expedited on the development with all possible speed of any promising agents, of means for their employment, and of defensive measures against them. Further, studies should be initiated to determine what American and foreign attitudes are toward non-lethal biological and chemical weapons and how to change such attitudes if unfavorable.

2. Field research in support of special operations concerned with influencing friendly and neutral peoples and organizing indigenous force systems is urgently needed.

3. The need for special weapons and equipment for use by indigenous forces (including guerrilla activities) should be investigated. The development of these weapons may in many cases be done effectively abroad.

4. New-approach work is needed on specialized vehicles to improve the mobility of ground troops in difficult terrain.

5. Research should be conducted on high-performance surface and underwater sea transport vehicles especially adapted for transport, landing, and attack operations.

6. Work should be initiated on a mechanized intelligence-gathering system (including covert elements and a combat control computer) able to provide an integrated display for combat control of forward-area operations.

7. Studies should be made to determine the usefulness of tank-type vehicles in probable combat situations.

8. Strong effort should be made to find new approaches to the air defense of forward areas and support bases, particularly toward the design of adequate warning systems and weapons systems having sufficient mobility and real effectiveness against attack at extremely low altitudes.

9. New approaches are needed to improve the effectiveness of air-to-surface missiles and rockets against small ground targets.

IV. GENERAL COMMENTS

A. On the Concept of Limited War

There are widely varying views of the concept of limited warfare and, in fact, there is a considerable range of opinion regarding the validity of focusing R&D and operations planning at all on the so-called limited war situations as distinct from the general war perspective.

Clearly, if principal interest lies in the problem of maintaining the peace, we are seriously concerned with the whole spectrum of troubles and situations that may lead to combat of some kind, that is, to disturbances of the peace. In a very general sense, the tools, operations planning and skills of force systems required for best results in the several degrees of limited combat are not those designed for maximum effectiveness in very large-scale operations, hardly more so than are tanks, bombing aircraft and battleships for doing the work of a municipal or area constabulary.

There appears to be a somewhat widely held view that component (limited) situations are relatively so less important than general conflagration that this country cannot afford to take the time and money to bother with them beyond the point of exploiting its major war tools as practicable when the occasion arises. The fallacy of this position is apparent if the effectiveness of limited-area disturbance techniques is conceded as a practical vehicle for Soviet realization of its end objective by a sequence of small steps. It is difficult to see how force systems designed along modern lines for handling unlimited war can alone cope with creeping aggression.

We have found little evidence in the component studies reviewed that the United States can justify hope of dealing with some of the potentially very important limited-area situations successfully if it has available in effective form only force systems designed for big war situations.

At the present time it is evident to ourselves, and certainly to an enemy, that we cannot deal with these situations effectively without use of nuclear weapons, in some cases without use at the beginning of a military operation. In certain other cases, of guerrilla-type conflict, there is almost no basis for expecting atomic weapons to be effective even in a limited military sense. In nearly all of the cases considered we believe that an obvious necessity for use of AW (nuclear weapons) by U.S. forces will almost certainly reduce the

deterrent position of our forces to an entirely unacceptable status, taking into account the probable verdict of world opinion, the propaganda advantages so developed for the Soviet position and the likely consequent alienation of otherwise friendly areas. In a few cases of "high-grade" limited war situations postulated in the reference studies, the extent of U.S. use of AW is carried (for success) to a point that risks precipitating a major nuclear war. Assumption, for example, that attack of central Chinese bases will actually be authorized to obtain the advantage of a "one-way" AW war appears entirely untenable to us.

The current R&D program directed toward the support of a non-nuclear capability is suffering generally from lack of funds and from a lack of interest at high levels in the subject. There is indication that a lack of understanding exists of the subtle significance of not having a capability for respectable force operations without (necessarily) using our nuclear weapons. Presumably the first deficiency is a consequence of the second.

We conclude that failure to be concerned seriously with specific requirements (specialized facilities) for handling limited war situations may perhaps be the surest channel toward that ultimate dilemma, for which there is no acceptable resolution, of having to choose at the end of a sequence of limited war situations unsuccessfully handled, between catastrophic use of big-war techniques and the other alternative of abdication from the responsibilities of a free world position in the Eastern Hemisphere.

B. On Funding

One obvious fact about our recommendations is that they will cost a substantial amount of money to implement. One of our Working Groups estimated the cost of an adequate program at approximately $500 million a year in R&D funds. Although we believe that desirable pruning of the current DOD program would more than finance the limited war program, we do not believe it should be necessary to derive its support from such a source. We feel strongly that the importance of developing an adequate limited war capability is such that an increased R&D appropriation for the purpose is warranted.

C. On Program Implementation

A difficulty in the management of DOD research and development programs, noticeable in RDB operations as in subsequent periods, is the selection of a best set of programs from a huge array of possible development and supporting research programs. Since World War II the importance of scientific and engineering contributions has been recognized well enough but frequently not the means for generating well-focused hardware programs. A tendency to

establish development projects with specifications laid out before good exploratory work has been finished, sometimes before the initiation of such work, and before serious operational studies have been made, has led finally to a large collection of unfinished major programs, many of which have apparently become obsolescent enroute. The philosophy back of this approach has evidently been that we could not afford to miss any potentially good alternatives and hence that all really good ideas should be tried out. The notion that good ideas should be looked at and worked over carefully is certainly sound, but the notion that only final hardware can be relied on for choice in every case is not, in our opinion. There are several expensive possible consequences of this procedure. One is having an arsenal of potentially good equipment of almost every conceivable kind that is generally unavailable in best form until too late. There is also the likely result of having a large framework for hardware production, nearly all of it in skeleton operation before it is needed for anything like best results and a considerable part of its products far from the best attainable.

This is believed to be too high a price to pay for the illusory virtue of appearing to expedite hardware procurement by specifying hardware (too) early. It is difficult to think of a more expensive framework within which the DOD program can proceed toward new equipment, or one which is less likely to assure maximum measures of effectiveness at any specific time.

There is a convincing basis for opinion that properly handled exploratory work can provide means for choosing a relatively small number of hardware objectives that have a highest chance on the average (the only significant measure of effectiveness in a national program) for completion and use on a minimized time schedule and at minimum cost.

This exploratory work should be carried through research stages necessary to answer fundamental questions determining whether (and how) the system can be made to work. It should also be carried through test-vehicle stages before design of final hardware is attempted, and should include in parallel the best obtainable effort to identify and understand the operational situations the hardware is intended to deal with. Equipment that does not meet fundamental needs of combat situations of the future may be technically good and yet of little value to the DOD and its program for defense.

D. On Study Interpretation

There is an apparent lack of machinery at top levels for digesting and extracting basic meaning from the considerable number of quite significant component studies actually being generated. Both the Department of Defense and the National Security Council appear to derive external advice primarily from occasional short-term ad hoc groups made up of people of high standing

who have very brief periods of duty and lack means or time for getting thoroughly into the essential analyses - or on the outcome of brief conferences which may be dominated by one or more individuals having strong opinions but sometimes little access to the over-all results of significant evaluation analysis. As a consequence there appears to be no adequate means at high levels for consummating the decision-making process with the full advantage of the required and often actually available component analyses properly digested. It is not a sufficient disposal of this point to notice that WSEG is set up to do such work for DOD. An extension of this type of work could encompass these perspective-forming operations. To accomplish this end, two conditions must be met, neither of which is now sufficiently involved:

1. The interpreting group must have a staff nucleus permanently assigned for this work, a clear charter to do this work and a direct two-way communications access to high-level decision making bodies.

2. There must be a close interaction between this group, JCS, and ASD(R&E) leading to sharply focused national programs, accepted and activated by top-level planning agencies in the Departments. This process does not now generally develop in the Departments or elsewhere.

E. On Cold War Operations

There is a specific area of work of enormous importance to the consummation of the program of this country that appears to have quite inadequate attention at the present time. This area concerns the psychological, economic, human relations and political factors so obviously important in determining the success of operations in many of the "limited combat" programs now or prospectively important. These matters are in a very subtle fashion involved with influencing poeple, both abroad and in our own country, to produce favorable environments for force-system operations if they become necessary and, hopefully in many cases, before situations deteriorate to the point requiring actual military operations. The kind and timing of propaganda, based on careful presentations of objectives and of reasons for force-action when it becomes necessary (for example, now, of reasons why mass-disabling weapons may actually be more conducive to end results desired by our potential friends and ourselves than from use of weapons of great destruction or from any other control techniques available), can be very important, and also consideration of the basis for design of small units for counter-subversion and effective human relations activities in the combat areas. Some very able small groups are working on these problems, within a limited framework of support. We think these programs should be extended to a global field, and that they should exploit a composite team of research people assigned to the important field areas for considerable periods of time on a continuing basis.

We have noticed the apparent great importance of two questions that seem to have much to do with any attempt to define and develop a successful weapons effort as part of a program for deterring (for preventing) the occurrence of this catastrophic show-down. No one appears to doubt that such a conflict might be catastrophic to the point of suicide if it actually develops.

These questions are:

1. Precisely what are the objectives, policy frameworks and expected operational platforms set by the western world?

We have little doubt about the essential nature of the Communist Party's objective. Its program, however unacceptable, is a definite program - one around which very extensive plans and a detailed structure of operations have been created. A great sales program, however repulsive, has been placed in motion.

Our own program is probably best defined as one to preserve the significant identity of the individual human being, and we believe the democratic process is uniquely required if this objective is to be achieved. The most serious trouble with our position seems to be that we have concentrated our effort on an attempt to deny the opposition its objective rather than (at the same time) to clarify and to develop a constructive operating program of our own, toward our objective. Certainly we have an objective capable of clear statement and of broad plans for action.

We believe doing something about this strategic posture is vital if the West is to maintain its position successfully, and we believe that no weapons choices will make much difference in the result unless we devote primary attention to the psychological, sociological and human-relations frameworks, as well as the full range of military frameworks, within which competitions of the future will be won or lost.

2. Is it possible for the opposition to accomplish its intended end-result by a small-step process of aggression without ever precipitating a situation in which the West can justify even to itself the application of its specialized strength (of the present type) as a countermeasure?

The dilemma referred to here implies a need for strength, real strength not superficially evaluated, over the full spectrum of the areas of wits-matching and arms-matching certain to be characteristic of the competitions we are faced with. Some of these areas are referred to in the remarks under the first question. A deterrent

framework that leaves holes unattended in this spectrum, and this we believe is our present situation, is likely to prove to be helplessly non-deterring in the sense implied in question (2).

F. On Optimum Fragmentation Weapons

Large scale work is needed on weapons design and on operational study of systems of the JACKSTRAW and MABFRAG type. The latter particularly needs design for more economical methods of dispensing the munition and better precision methods for its placement. The former is already developed up to the engineering test state in a variety of systems ranging from sizes for use by the individual foot soldier to area weapons that rival the nuclear fission warhead on a cost basis, but lacks both operational tests by troops and stock-piling authorizations. These weapons are particularly important because of their high lethality per unit weight and per dollar; because of their high degree of enhancement of the fire-power of the individual, squad or higher unit; because of their flexibility with regard to size and relatively light weight both for launcher system and supply; and because no moral opprobrium attaches to them. Furthermore, they are capable of alteration to important anti-materiel characteristics as well as anti-personnel characteristics and so fit into our American way of manufacture that we should be able to keep well ahead of any potential enemy, even though present models should be copied.

G. On Available Analyses

Principal references here are to the conclusions and opinions by WSEG, RAND, NAVWAG, ORO and Service R&D groups, looked at in a comparative sense.

Comment on the R&D programs is based on comparison of the indicated requirements with the actual programs.

RAND

a. It is essential that nuclear weapons be used in what are called "high grade" (limited) war situations. These are situations with large, well-organized force systems on both sides. Nuclear weapons will be low-yield type and "selectively" used.

b. In a purely guerrilla-type situation nuclear weapons will (generally) be ineffective.

c. If ground-force action becomes extensive, there is (generally) a "low momentum" situation and quick-action air lift operations are probably not necessary.

d. Local (forward area) ground-to-air defense is essential.

e. There are several implied or assumed factors, such as one-way atomic action possibly persisting for long periods presumably on the assumption that the Soviet will be willing to tolerate stalemate between large Chinese or local communist forces and U. S. small-force units using nuclear weapons, perhaps for advantages in propaganda positions (and for other possible political reasons); that in South East Asia and in some other areas reconnaissance and other tactical fire support operations will be ineffective; conclusion that very short range missiles are more important here than 50-100-mile missiles (for which targets may often not be identified).

WSEG

a. In some situations use of nuclear weapons is incompatible with national objectives.

b. Assumption: Soviet will supply nuclear weapons to peripheral forces operating for Soviet-Sino bloc, and the persistence of one-way nuclear combat is "unthinkable."

c. In the areas considered (Korea, Indo-China, Middle East, Pakistan-Afghanistan) a single military organization and operation for both nuclear and non-nuclear warfare is not definable. Studies were therefore segregated.

d. Large-scale airborne/amphibious operations in two-way use of AW are not practicable.

e. Great differences exist between areas studied in the vulnerability of major targets.

f. Best supporting weapons and the extent of communication lines (and other line targets) may vary greatly with the areas.

g. Special equipment and operations doctrine for indigenous force units are essential (local forces will not be self sufficient).

NAVWAG

a. All-out war is obsolete as an instrument for the attainment of national objectives.

b. The most likely use of armed strength will be in combatting limited aggression. Massive retaliatory capability cannot be considered effective for stable deterrence of, or reply to, such aggression.

c. In our research and development program, increased emphasis on long-term projects and basic research appears desirable. Shorter-term military development should be oriented toward improving the invulnerability and diversification of strategic forces, and toward urgent build-up of the graduated-deterrence capability.

Marine Corps

Operations planning and equipment for forward area operations are based on a "policy" not to initiate use of AW, but with a quick-acting response if enemy uses them.

a. Use of helicopter techniques for early landing and logistics operations will probably be effective.

b. Need for very lightweight specially adapted weapons and vehicles is obvious (as in USA plan).

c. Surveillance and reconnaissance emphasis in tactical fire support is placed near top of R&D list for increased effort.

d. Adequate Navy support via assault ships and carrier task force units is an essential foundation for the entire program.

ORO & Army (R&D)

a. Battle group concept (units of about 3,000 men) requires effective, assigned and ready air transport (of the order of 100 large transport aircraft for 48-hour transfer).

b. Quick-acting system is vital; operations in collaboration with Marines will be necessary in many situations.

c. Quick-acting system requires 2 or 3 types of small tactical support and local transport aircraft.

d. It is vital that (very) lightweight vehicles, reconnaissance equipment and special (lightweight) weapons be made available.

e. Simple, reliable, small communications units are needed for the forward area work.

e. Emphasis is placed on Davy Crockett type of very small nuclear weapons for forward area use.

DSB Group Comments

a. Situations studies by operations research groups fall, in general, into two broad categories:

(1) Sophisticated, organized force systems on both sides,

(2) Opposition mainly guerrilla type, with infiltration, and subversion and local-disturbance operations.

However, as pointed out in WSEG and other reports, important differences in environment, terrain and opposing force operations may greatly affect choices in weapons and other equipment.

Eventually situations should include a third class in which the West's forces themselves operate in a sophisticated manner via guerrilla-type techniques with infiltration, and with local-influence mechanics exploited; specialized equipment needed, and both the operations and the equipment objectives deserve careful study now.

b. Differences notable with respect to emphasis on need for quick-response ground force units: ORO, USMC, USA, and WSEG generally concur. RAND's contrary argument in respect to certain situations likely to persist in any case is doubtless valid but there seems to be under-emphasis here on the importance of small ground force units brought in quickly before a situation deteriorates to well-defined military combat. Current sequence of situations (1956-58) appear to confirm this importance, and the R&D implications are both definite and urgent.

c. We doubt the validity of the assumption that a U. S. one-way nuclear warfare position with small force system will persist. It may persist but probably not because the other side fails to match nuclear weapons in a fairly early reaction (i.e., if U. S. uses tactical weapons first).

d. None of the studies including those of WSEG has adequately reported analytic studies of the use of non-lethal, mass-disabling BW-CW agents. Progress is now being made with the collection of evidence, and the nature of supporting research and operations testing can be shortly recommended. An initial effort is being made this summer to estimate effects on certain war game results, and this analysis should be continued.

e. Navy program for assault ships and specialized equipment for USMC is inadequate, including that for weapons, reconnaissance equipment, and (specifically) for countering mine fields in the vicinity of beach heads.

f. USMC and USA are collaborating on a program for certain special weapons (non-nuclear) of great potential effectiveness (including the BW-CW research and development effort).

V. BIBLIOGRAPHY

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APPENDIX A

List of Conferences and Interviews Held by the Task Group

8 January 1958:	Conference with advisors. Discussion of mode of operation of the Group and the research and development needs of the Marine Corps.
31 January 1958:	Conference with the Deputy Chiefs for Research and Development in the Military Departments. Discussion of research and development needs.
14 February 1958:	Conference with the Chief Chemical Officer, USA, and others. Discussion of the potentialities of biological and chemical weapons for use in limited war.
7 March 1958:	Conference with representatives of the Chief Signal Officer, USA, and others to discuss Army communications; and with representatives of the Chief of Ordnance, USA, and others to discuss Army combat transport equipment.
26 March 1958:	Conference with representatives of the Chief of Research and Development, USA, and others to discuss fuel handling in forward areas.
7 May 1958:	Conference with Dr. T. E. Caywood and group on interpretation of limited war studies.
27 May 1958:	Conference with Army and Marine Corps representatives to discuss Jackstraw and biological and chemical warfare.
3 June 1958:	Briefing by the Army on the Jackstraw family of weapons.

14 - 17 July 1958: Joint Meeting at Woods Hole, Massachusetts, with the National Academy of Sciences - Air Research and Development Command Limited War Committee. Discussion of the use of biological and chemical weapons in limited war.

31 July - 1 August 1958: Joint Meeting at Woods Hole, Massachusetts, with the National Academy of Sciences - Air Research and Development Command Limited War Committee. Discussions with the Assistant to the Secretary of Defense for Special Operations.

18 - 23 August 1958: Meetings of the Task Group and principal advisors to develop and prepare the final report.

NOTE: The above-listed conferences comprise only those formally called and in which participation of officials not members of the DSB Task Group was particularly desired. A considerable number of less formal meetings of the Group were held during this period of time. At all formal meetings, executive sessions were held to determine desirable courses of further action, both by the Task Group and as to required OASD(R&E) staff support.