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MDR: 11-M-1287

**Final Report
of the
DEFENSE SCIENCE BOARD
TASK FORCE ON SURFACE SHIP
VULNERABILITY**

October 1979

**Office of the Under Secretary of Defense
for Research and Engineering
Washington, D.C.**

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OFFICE OF THE UNDER SECRETARY OF DEFENSE FOR RESEARCH AND ENGINEERING
WASHINGTON, D.C.

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DEFENSE SCIENCE
BOARD

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OFFICE OF THE SECRETARY OF DEFENSE
WASHINGTON, D.C. 20301

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17 OCT 1979

Honorable Harold Brown
Secretary of Defense
Pentagon, Room 3E880
Washington, D. C. 20301

Dear Harold:

This is the report of the Defense Science Board Task Force on Surface Ship Vulnerability which I chaired. As you will remember, Dr. Frank Press was originally in charge of the study, and we asked him to let us handle it. The question as first stated was essentially "Is the present surface fleet too vulnerable to be of use in a future war?". My Task Force changed the question to ask "Can surface ships perform their missions in peace, crisis and war, and does their utility and survivability justify increases in procurement?". The answer to the revised set of questions is yes [REDACTED]

[REDACTED] Significantly, we could see no viable alternative to surface ships in carrying out the missions assigned to them and upon which our national security depends. We conclude that surface ships are survivable in most cases, and found no threats with which we cannot cope, given adequate resources.

NAV 33(b)(7)(b) OSD 3.3(b)(4)(5)(8)

We think that there would be some gain in reprogramming five percent of the current shipbuilding funds in support of survivability items. We spell these out and think we should spend this money. We can improve the survivability of our current ships, and I can't think of anything else that can do the job these ships are doing (even if we had anything else).

[REDACTED]
[REDACTED] We believe that "citadels" should be supplemented by peripheral offensive and defensive assets. [REDACTED]

[REDACTED]
[REDACTED] This will
[REDACTED] result in improved overall survivability [REDACTED]

NAV 33(b)(7)(b)

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OSD 3.3(b)(4),(5)(6)

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NAVY 3.3(b)(5)(6)

We are very mindful of the fact that one should not come to you with Task Force recommendations to increase expenditures without finding a place where expenditures can be reduced. Admittedly, we have not done this in this case. Perhaps a discussion with you can be of some use to show me how you would approach expenditure reduction. Conceivably, you could ask ASD(PA&E) to discuss it with me, as this subject could be of intense interest to him.

Sincerely,

A handwritten signature in cursive script, appearing to read "Gene", is written over the typed name.

Eugene G. Fubini
Chairman

Attachment

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EXECUTIVE SUMMARY (U)

(U) The report concludes that surface ships today are an essential investment for national security in peace and war, and we see no viable alternative method of performing surface ship missions. Surface ships in adequate numbers can endure in most conflict scenarios today and in the immediate future long enough to contribute significantly at the onset and adequately during hostilities to achievement of national objectives at sea and on land. Surface ships can survive to play an important post-hostilities role in providing presence for the consolidation of objectives. Soviet naval capability trends and changing technology worldwide will make surface ships much more vulnerable in the 1980s and 1990s than they are today unless we begin to take urgent action now. Technological and operational solutions are available which will, if adequately supported, reduce the trend to increased vulnerability.

(U) The Task Force concludes that an offensive naval strategy, in support of national objectives at sea and on land, is essential to insure that surface ship survivability is within acceptable limits.

(U) The primary reason for the increased fact and perception of vulnerability of U.S. surface ships is the challenge presented by the Soviet military and naval capability. Underlying this change in perception is the change in the relative power of strategic "central" nuclear forces to the favor of the Soviets. A secondary reason for perceptions of surface ship vulnerability is the changing technologies in tactical nuclear weapon systems, real time surveillance, smart weapons, much improved submarines, chemical warfare and mine warfare. The key to preserving acceptable levels of surface ship survivability is to maintain a posture of limited superiority with the Soviet Union, striving toward total superiority, concentrating on systems in the changing technologies that enhance our capability for endurance and bamboozle his. We need a limited superiority because

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we must control the seas that are vital for us; the Soviets need fewer forces to deny the U.S. the sea than we need to control it. If we do not plan for limited superiority our surface ships and other naval and military forces will be very vulnerable. We say this despite the fact that we have found no threats that cannot be defended against, given adequate resources.

(U) Additionally the Navy should have a readiness (and exercise it) against the totality of the threat spectrum, including chemical and mine warfare, and with particular attention toward nuclear war involving forces at sea and ashore.

(U) A primary concern of the Task Force is the direction being taken by the Navy in building future force structure. The aircraft carrier of today represents on "offensive citadel." We need to distribute our offensive force; for example, we could employ SLCM, backfitted into the SPRUANCE class destroyer and installed on new construction. We are perpetuating the "citadel syndrome" by building a "defensive citadel," the scarce AEGIS ship (DDG-47). The DDG-47 type ship is an essential defensive system in development today; but in order for our defenses to be fully effective, the DDG-47s must be supplemented by more AEGIS type defenses modified to permit their installation in smaller ships (such as DD-963 and DDX), even if a loss of individual performance in these ships is a consequence.

(U) The continuously increasing capabilities of offensive weapons of all kinds (including conventional, chemical, and nuclear warheads) lead the Task Force to recommend that the Navy modify its present direction: The members urge the Navy to give much greater emphasis to "distributed forces" instead of "citadel forces." By "distributed forces," we specifically do not mean increased numbers of smaller, less capable ships. We do mean

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reducing our dependence on citadels and distributing modern offensive and defensive capabilities among ships in addition to carriers and DDG-47s. This results in improved overall survivability by reducing Soviet capabilities of concentrating forces against a limited number of our force elements.

(U) Naval force and single ship survivability items are described and prioritized herein. As an immediate action it is recommended that five percent of the current shipbuilding budget be reprogrammed in support of these items. (See Section V and Charts 4 and 5.)

(U) Assuming current force levels as a minimum it is estimated that thirty percent additional shipbuilding funds over the next decade will be required to evolve the Navy toward a "distributed force" concept. It is recommended that the Navy be tasked to demonstrate how it would spend a shipbuilding budget increased by thirty percent in support of a "distributed force" concept. It is suggested that the priorities and opportunities developed in this report be used as a guide. Upon approval of the Navy Distributed Force Plan (and this should be done prior to approval of the FY 82 budget), it is recommended that all efforts be made to effect a thirty percent increase in shipbuilding funds. (See Section V and Chart 6.)

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I. INTRODUCTION (U)

(U) The work of the Task Force on Surface Ship Vulnerability was directed to an analysis of the threats and of the vulnerability of the ships that are now in the Fleet or are planned to join it in the near future. It was concluded that the primary cause of recent changes in fact and perception regarding the vulnerability of naval surface ships is the dramatic increase in the Soviet military and naval capability; a secondary cause is the changing technologies in tactical nuclear weapon systems, real time surveillance, "smart" weapons, improved submarines, chemical warfare, and Soviet mine warfare capability.

(U) We offer this report to offset the perception that naval surface forces are suddenly "too brittle" to be a worthy investment. Of course, nothing, including missile silos and submarines, is invulnerable. The question is not whether surface ships are vulnerable: They are. The question to be answered is "How vulnerable are surface ships?" That is, can they endure long enough to perform unique and needed tasks, and are such ships a worthy investment for national defense?

(U) The United States has faced and dealt with new threats and new technologies before, and there is no reason why the same cannot be done now.

(U) The Task Force reviewed surface ship forces and their missions and concluded that they are an essential part of our strategy of deterrence for which we could see no viable alternatives. The question of how survivable we should make our surface ship forces becomes a matter of funding and national resolve.

(U) Today, surface ship forces are sufficiently survivable under most likely circumstances. However, when we look to the future, we conclude that the current state of the naval balance between the U.S. and Soviet naval forces is unsatisfactory, and will, without further action on our part, change even more dramatically in favor of the Soviets; their

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increasing ability to detect, track and attack our surface ships, possibly or probably with tactical nuclear warheads in cruise or ballistic, precision-guided missiles, launched from aircraft, submarines and surface ships could be sufficient to upset the balance in a major way. A sense of urgency must be attached to preventing this from happening.

(U) The Task Force established a hierarchy of naval force and single ship features that enhance survivability as follows:

PRIORITY 1 - Force Survivability Features

<u>Sub-Priority</u>	<u>Feature</u>
1.	Rules of Engagement
2.	Extended Horizon Surveillance
3.	Offensive Capability
4.	Distribution of Offensive Force
5.	Defensive Capability
6.	Deception
7.	Jamming
8.	Emission Control
9.	Mine Warfare

PRIORITY 2 - Single Ship Survivability (Features that minimize the probability of being hit)

<u>Sub-Priority</u>	<u>Feature</u>
1.	Offensive Weapons
2.	Reduction of Observables
3.	Defensive Weapons

PRIORITY 3 - Single Ship Survivability (Passive protection, assuming a hit)

<u>Sub-Priority</u>	<u>Feature</u>
1.	Fire Fighting
2.	CBR Protection
3.	EMP Protection
4.	Vital Space Location

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5. Underwater Shock Protection
6. Blast Protection
7. Fragment Protection
8. Flooding Control
9. Redundancy of Equipment

(U) The above priorities should be used in determining new ship characteristics. With respect to retrofitting existing ships, the Task Force established the following priorities:

1. Retrofit oilers and combatant ships with features that would not themselves require a major overhaul or extensive changes in standard equipment. For example, installing a positive pressure CBR protection system may require modifications that are excessive.
2. Using these criteria, apply the priorities as one would for a new ship.

(U) In determining allocation of funds between retrofit and new construction, the Task Force concludes that the Navy's diminishing force size is of such consequence that priority must go to new construction. Numbers of ships makes a significant contribution to surface ship force survivability and we must plan for a Navy of credible size.

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II. THE CHANGING THREAT (U)

(U) The Navy is the only Service that can provide platforms abroad in the absence of land bases. In fulfilling this function the Navy is by necessity exposed to a variety of possible enemy actions in conflict and non-conflict situations.

(U) In past years, under the umbrella of U.S. nuclear superiority, and with only minor threats outside of the NATO arena, the U.S. Navy could afford to structure forces that paid only lip service to such threats as chemical warfare, tactical nuclear warfare and "Third Country" launched anti-ship missiles. This situation has changed rapidly as the Soviets have gained favor in strategic "central" nuclear forces and precision guided weapons have proliferated into Third World countries. We must now pay strict attention to the total threat spectrum.

OSD 3.3(b)(4)(5)(8)

[REDACTED]

We can envision situations, particularly in non-NATO contingencies, where the threat would be primarily from Soviet surface ships with ASCMs (particularly in view of the Soviet surface shipbuilding program). Thus, we should keep Soviet surface forces constantly under surveillance, targeted and at risk in order to improve our own survivability.

[REDACTED]

NAVY 3.3(b)(5)(8)

(U) This extended horizon surveillance must not be viewed as a "Navy only" problem. To achieve an adequate surveillance, national overhead assets must be used as well as some reliance placed on Air Force AWACS and to the

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degree possible, Allied assets. Today, the integrated use of non-Navy surveillance assets is not adequately planned nor practiced.

(U) The question "How vulnerable are our ships?" does not require us to quantify surface ship survivability against all enemy threats and all scenarios of any time frame. Each enemy action in any scenario has a counter, and survivability on both sides will be a function of resources skillfully applied before and during the conflict. For example, the survivability of our surface ships is highly dependent on our ability to strike at the Soviet bases and choke off access to the oceans. (Destroy BACKFIRE aircraft at their bases, hit the submarines at their bases, close the Greenland-U.K. gap, strike anti-ship missile batteries in Third World countries, etc.) Similarly, once Soviet forces are at sea, we need to concentrate on killing their units before they can coordinate mass strikes and launch their missiles. Thus, offensive resources skillfully planned and applied are near the top of the hierarchy of surface ship survivability features.

(U) Response to Soviet integrated land and sea forces in the maritime environment should not rely on U.S. Naval Forces alone. Defense in depth of U.S. Navy formations is required, using integrated application of all U.S. and Allied assets. For example, shore-based assets can be used to intercept and interrupt Soviet naval communications to Moscow. Soviet long-range reconnaissance and missile-launching aircraft can be attacked by land-based forces and attrited before they reach naval groups. So far, there is little evidence that equipment design, personnel training or procedures recognize the need for this sort of force integration.

(U) In the period 1945-1970, the U.S. Navy was essentially unchallenged at sea. A generation of government planners and naval strategists became accustomed to the idea that a U.S. Navy ship was an "untouchable sanctuary" from which power and influence could be projected overseas. (As in Korea and Vietnam.) In the 1970s, the growth of the Soviet Navy eroded this

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idea of U.S. Navy ships as "untouchable sanctuaries." Once again U.S. Navy surface ships were "vulnerable." It is noteworthy that many of the Navy's critics fail to distinguish between "vulnerability" and "survivability." Ships are vulnerable, but in many cases they are very survivable.

(U) In looking to the future and the worldwide role of the U.S. Navy in supporting our interests and diplomacy, we must distinguish between forces that will operate in two distinctly separate cases:

1. Areas of concentrated Soviet force.
2. Areas where Soviet force is not concentrated.

We should plan, to structure our forces and doctrine such that the more survivable forces carry offensive power into Area 1, while other forces operate in Area 2, moving into Area 1 after initial strikes are carried out and the threat has been reduced.

OSD 3.3(b)(4),(5),(6)

[REDACTED]

This general-

ized statement is made with some significant reservations:

1. Even when opposed by [REDACTED] an attack against a land target [REDACTED] would be hazardous indeed.

2. Even a very skilled commander depends upon the timely availability of secure and reliable C³I capabilities. NAVJ 3.3(b)(5)(8)
The Task Force was not presented convincing information about our C³I capabilities: serious doubts continue to exist in the minds of its members about this important issue. Our [REDACTED]

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OSD 3.3(b)(4)(5)(8)

when engaging a skilled enemy. Our targeting abilities against mobile and transitory targets are limited [REDACTED]

[REDACTED] With the existing rules of engagement and the equipment available today, the lack of identification capabilities can be [REDACTED] handicap.

(S) If, [REDACTED] pitting the U.S. Fleet against [REDACTED] the Soviet Fleet, as we know it today, [REDACTED] our ships would be severely damaged but could fulfill the missions assigned to them. [REDACTED]

[REDACTED] The reason for this statement is not that we have found any threat either existing today, or foreseeable in the future for which we could not have a suitable defense.

(U) The problem is that the lack of funds has prevented the realization of available defenses into deployable capabilities.

(U) Technology has produced changes which lead to the increased vulnerability of all military or naval forces on the earth or ocean surface. In order of threat, these are:

[REDACTED]

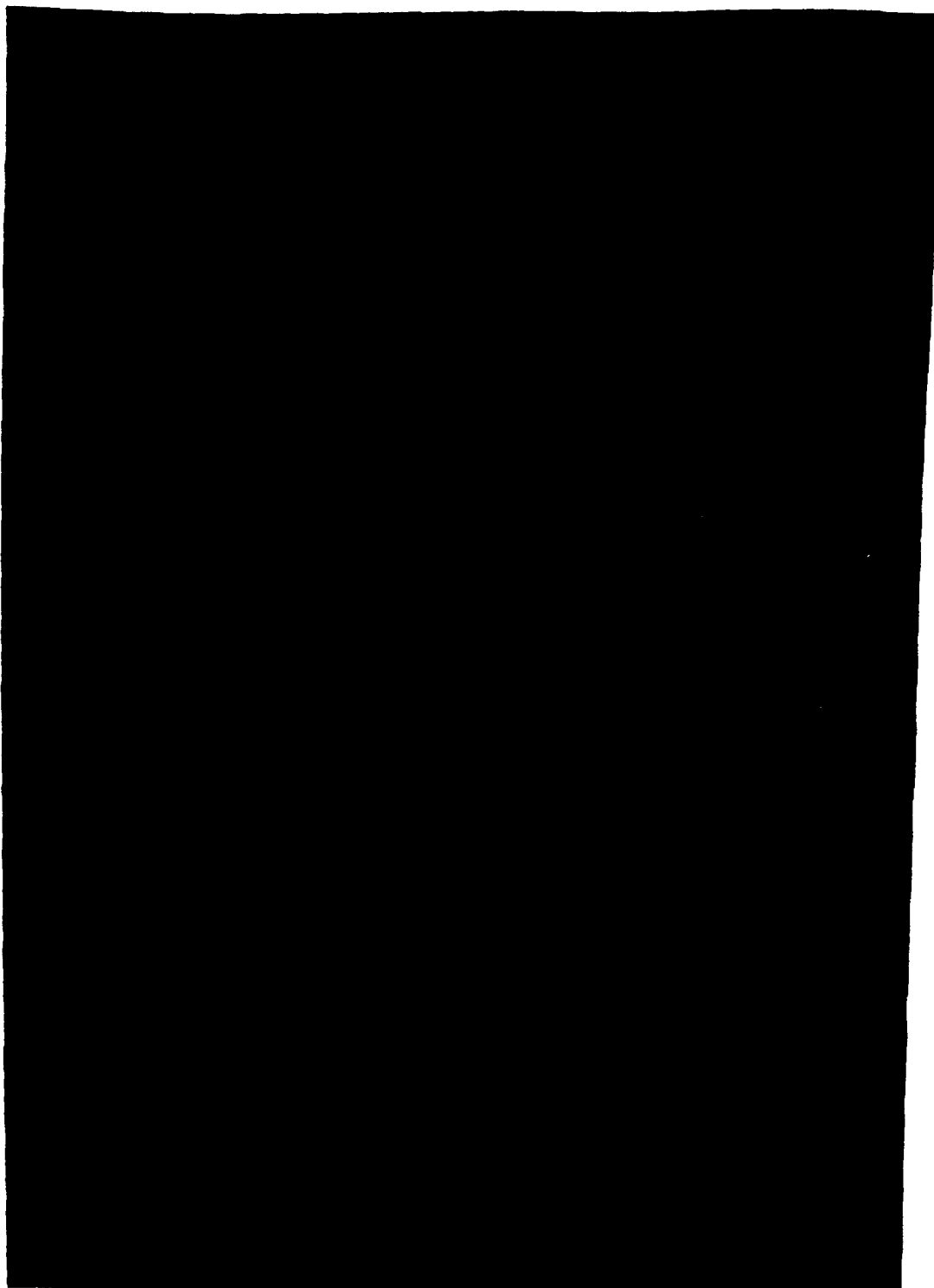
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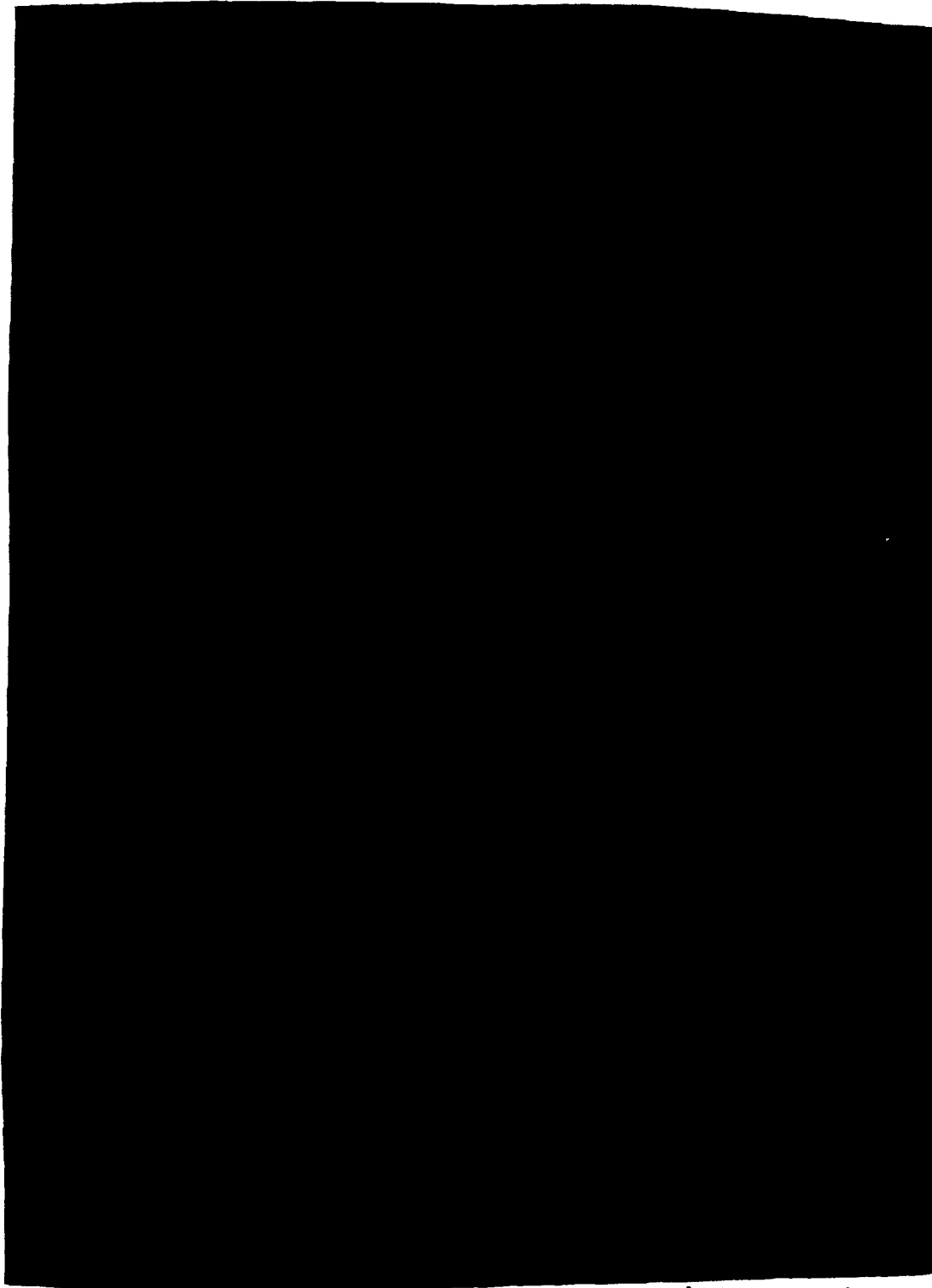
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OSD 3.3(b)(4)(5)(6)



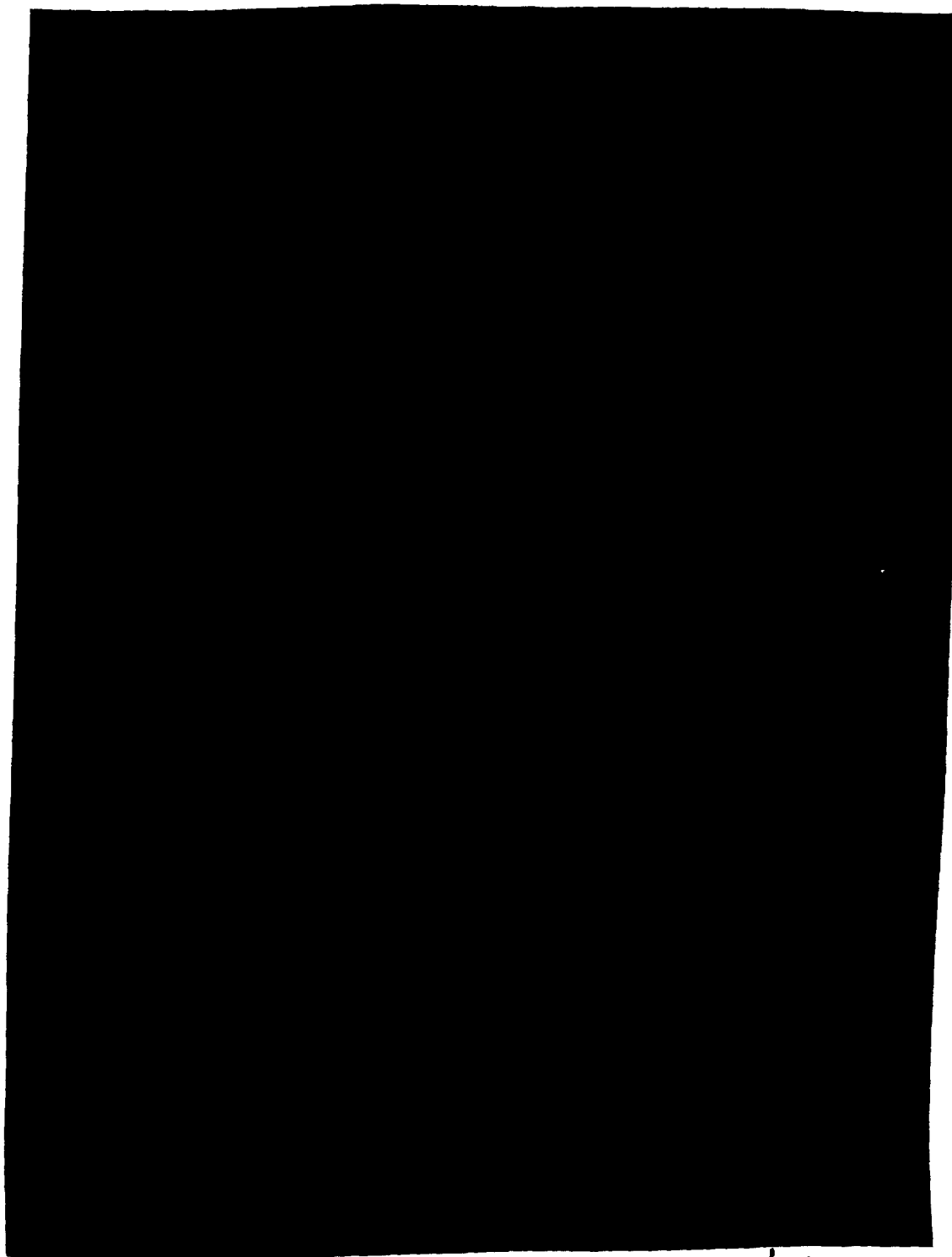
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OSD 3.3(b)(4), (5), (8)



NAVY 3.3(b)(3), (8)

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III. PRESENT STATUS (U)

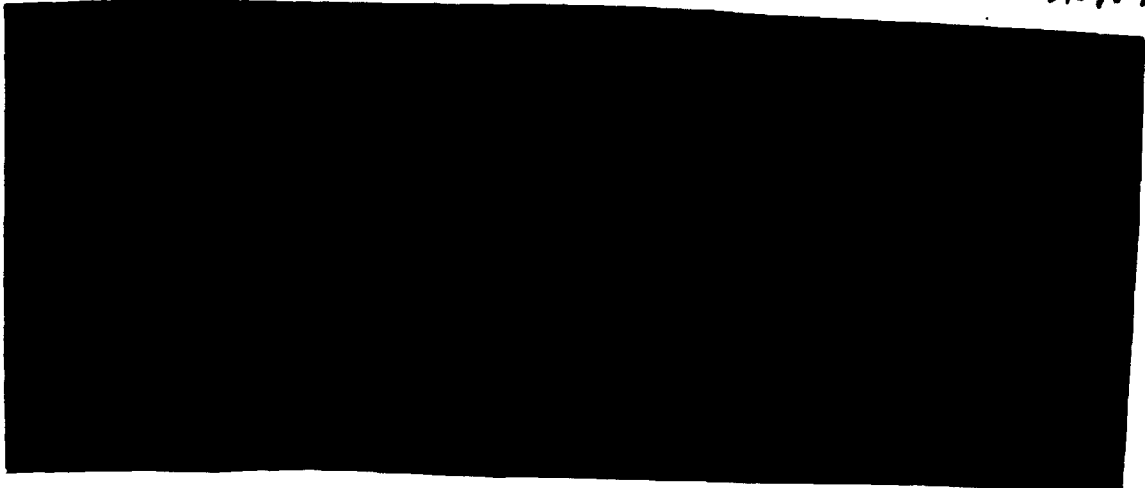
(U) Strengths (U)

(U) 1. The U.S. Navy has a strong offensive capability in its Battle Groups built around the large aircraft carrier. For now and the immediate future, this type of force structure must and will continue to be maintained as a strength. By the mid-1980s, however, additions to the Battle Groups must be aimed at the creation of more distributed and flexible forces in which, of course, the aircraft carrier will represent the most important part.

(U) 2. The defensive capability of the Battle Group, based on "defense in depth" is a strength against the current threat. Point defense systems (such as Phalanx) and improvements to current systems (such as SM-2 upgrade) that have been developed show promise; they will make significant contributions against the near term threat if deployed in adequate numbers.

(U) 3. Fire fighting systems aboard ship have been tested by actual occurrence and proven to be able to contain large fires. Programs in this area are considered strong and should remain so.

OSD 3.3(b)(4),(5),(8)



NAVY 3.3(b)(5),(8)

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more planning and coordination is required, and the Navy should know how much it can depend on land-based "blue air" and associated sensors/C3.

[REDACTED]

NAVY 3.3(b)(5)(8) OSD 3.3(b)(4)(5)(8)

(U) 4. The survivability of naval forces in parts of the world remote from the U.S. is reduced by the "citadel syndrome," that is the concentration of a large percentage of the warfighting capabilities in very few platforms. When our forces are required to operate without an aircraft carrier (such as now in the Persian Gulf), they have limited survivability and capability because of their lack of offensive power. The "citadel" approach has the fundamental disadvantages of giving the enemy very few targets and of introducing extreme sensitivity to the loss of a single ship.

[REDACTED]

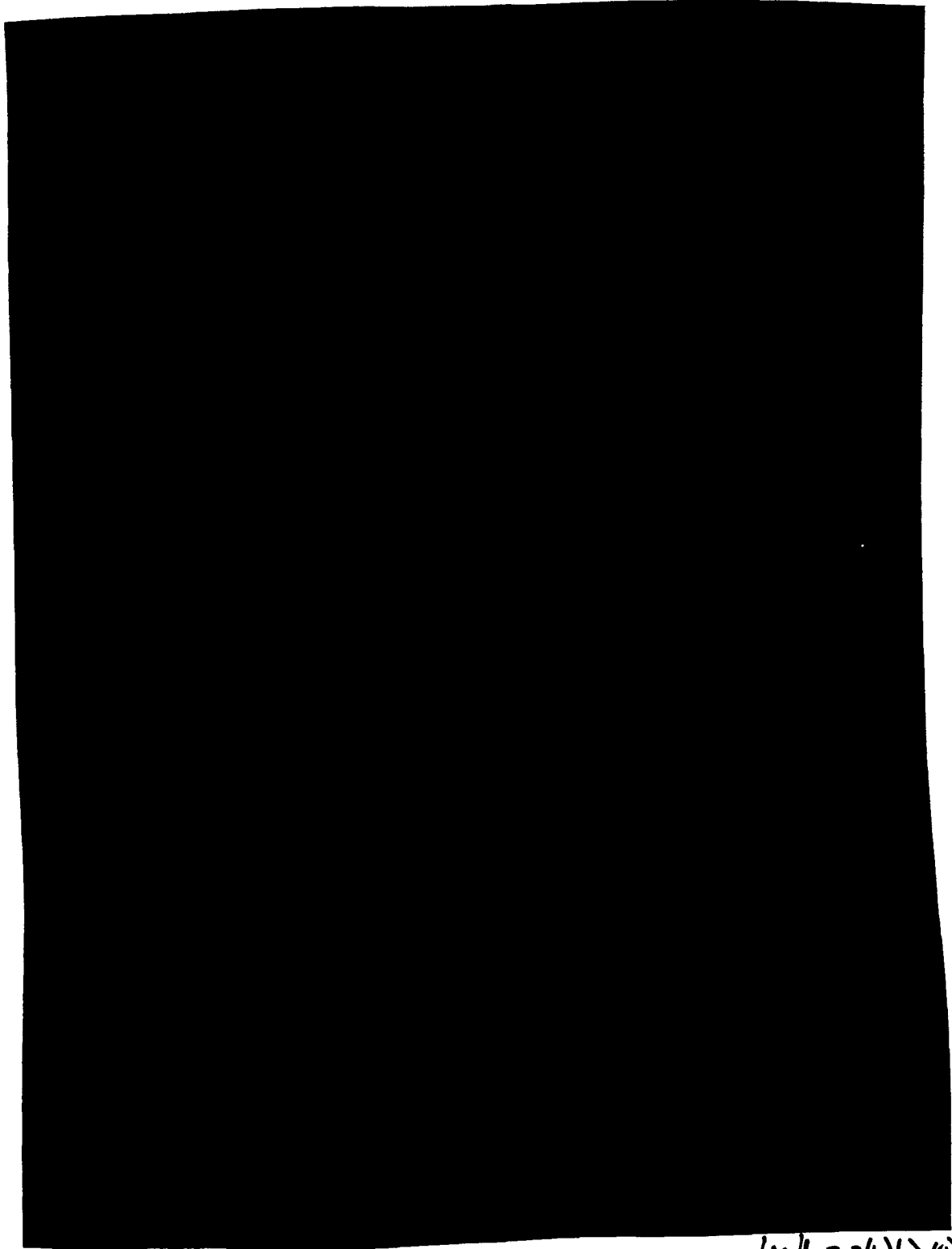
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(C) 10. Passive protection features (sometimes called anti-"cheap kill" features) [REDACTED] Navy ships. [REDACTED]
[REDACTED] to live in a nuclear or chemical environment; this statement applies not only to radiation, but also to EMP.

NAVY 3.3(b)(5)(8)

OSD 3.3(b)(4)(5)(8)

(U) NOTE: See Charts 1, 2, and 3 for a summary of strengths and weaknesses in surface ship force and single ship survivability features.

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IV. OPPORTUNITIES (U)

(U) 1. Rules of Engagement (in order of priority) OSD 3.3(b)(4)(5)(6)

[REDACTED] ROE should not
prohibit employing directional jamming/deception techniques [REDACTED]

NAVY 3.3(b)(5)(6)

(U) b. Establish rules of engagement that become more flexible as conditions of readiness increase. For example, give the on-scene commander more options to attack unacceptably threatening forces and thus preserve his forces during any critical initial exchange of weapons at the outbreak of war.

(U) c. Change the pattern of naval peacetime deployments. For example, political commitments hold our ships in the Mediterranean where they are constantly shadowed. We should practice a more random exposure of major assets in areas of concentrated Soviet force in order to enhance their survivability. Such an action would also increase the flexibility of naval forces, allowing them to be deployed more frequently into world-wide areas of importance, such as the Persian Gulf.

(U) d. Develop procedures to better utilize land-based "blue air" and associated sensors for fleet defense.

(U) 2. Extended Horizon Surveillance (in order of priority)

[REDACTED]

NAVY 3.3(b)(5)(6)

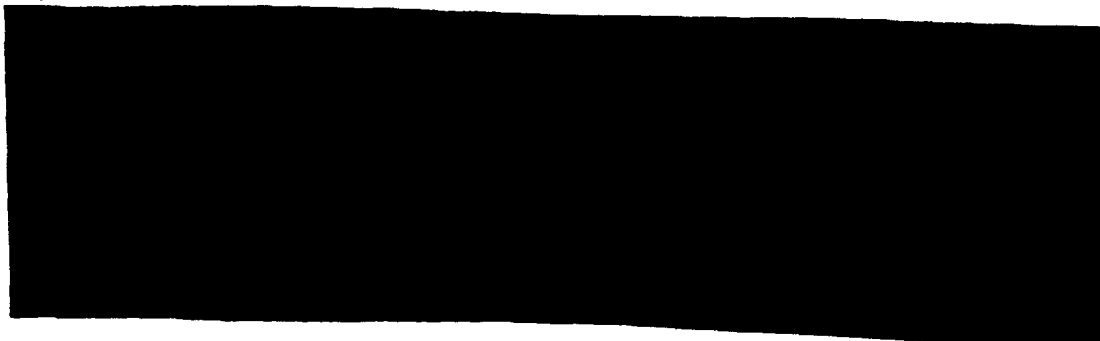
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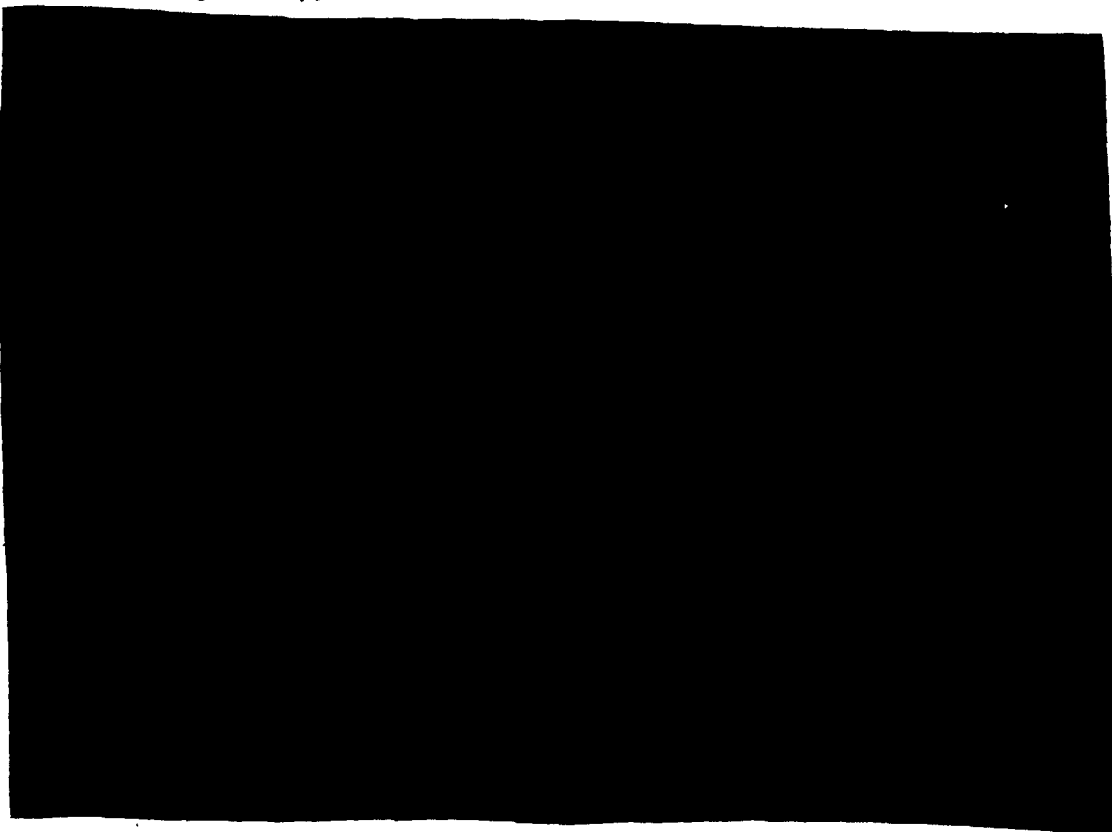
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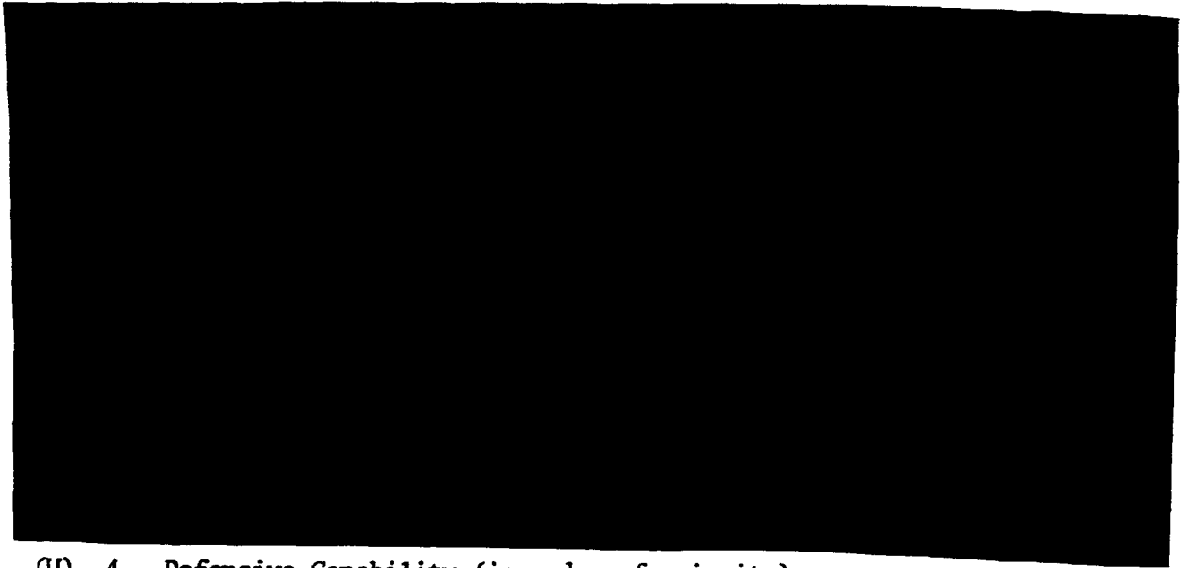


- (U) 3. Offensive Capability/Distribution of Offensive Force (in order of priority)

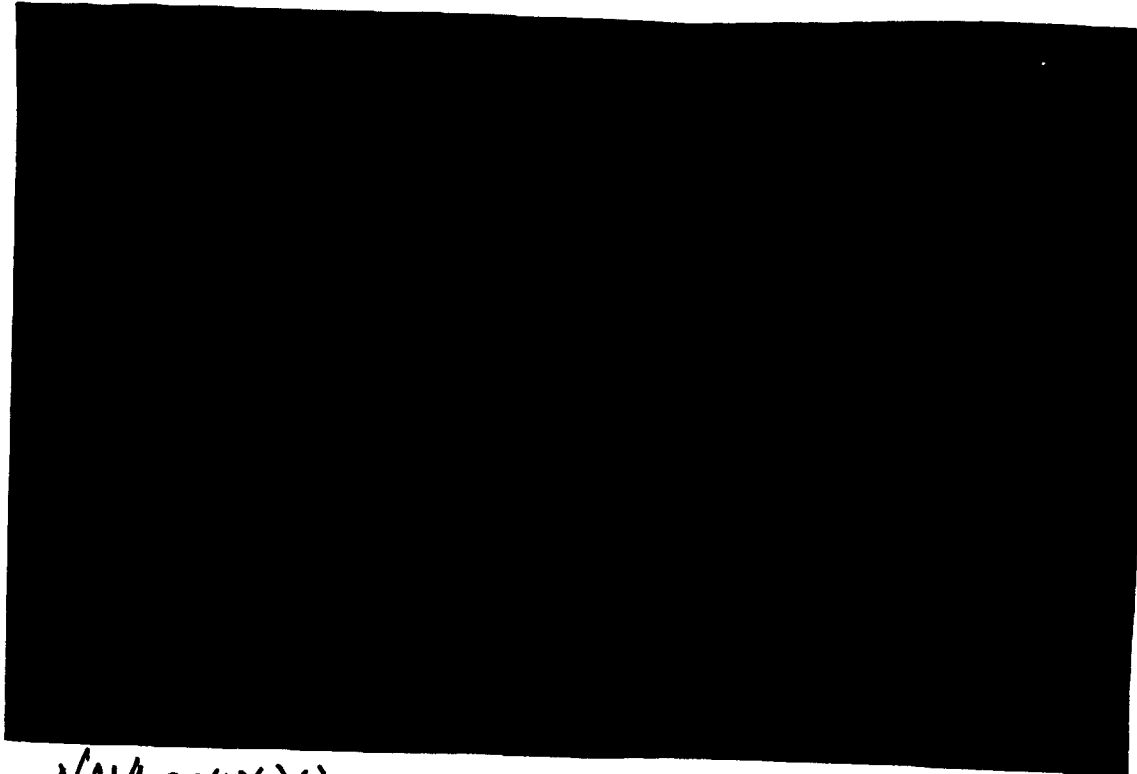


(U) b. Past efforts toward V/STOL aircraft have been vitiated by the requirement that such an aircraft have capabilities similar to CTOL rather than exploiting V/STOLs to support new concepts. The Navy should reconsider its requirements for a mid-range performance V/STOL in such

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(U) 4. Defensive Capability (in order of priority)



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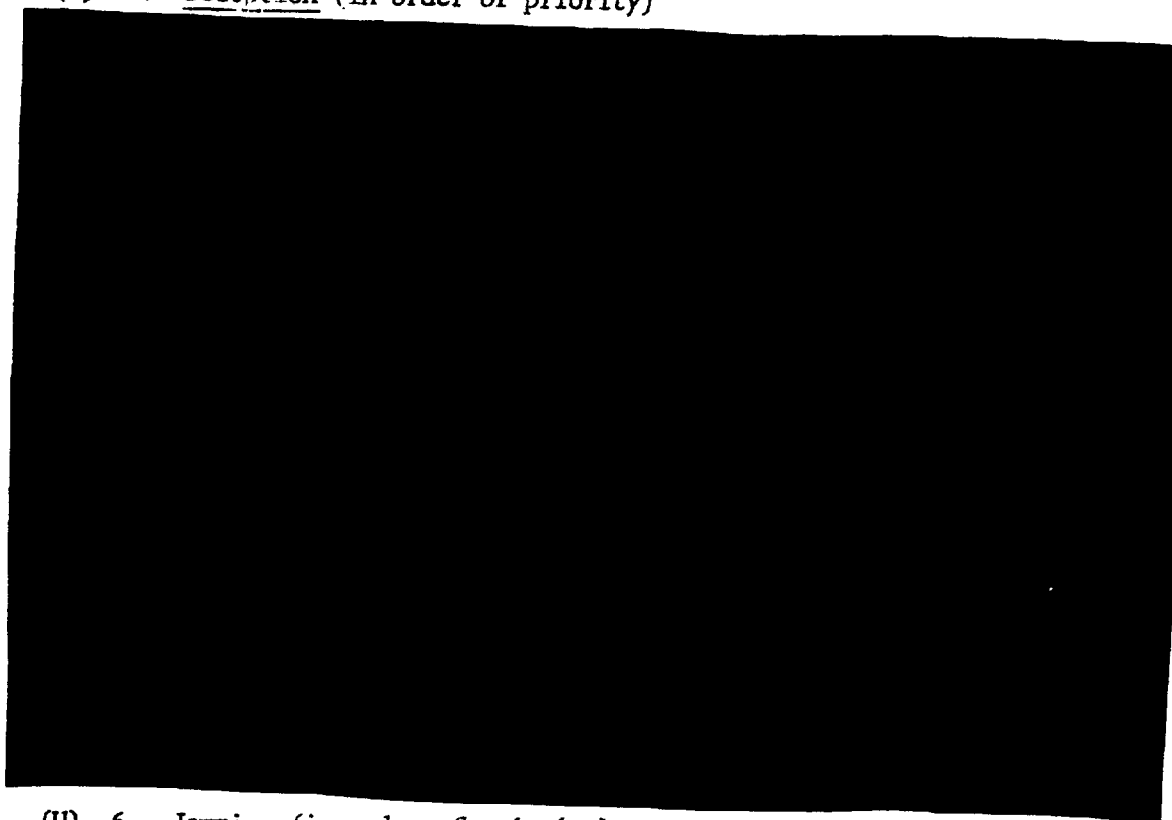
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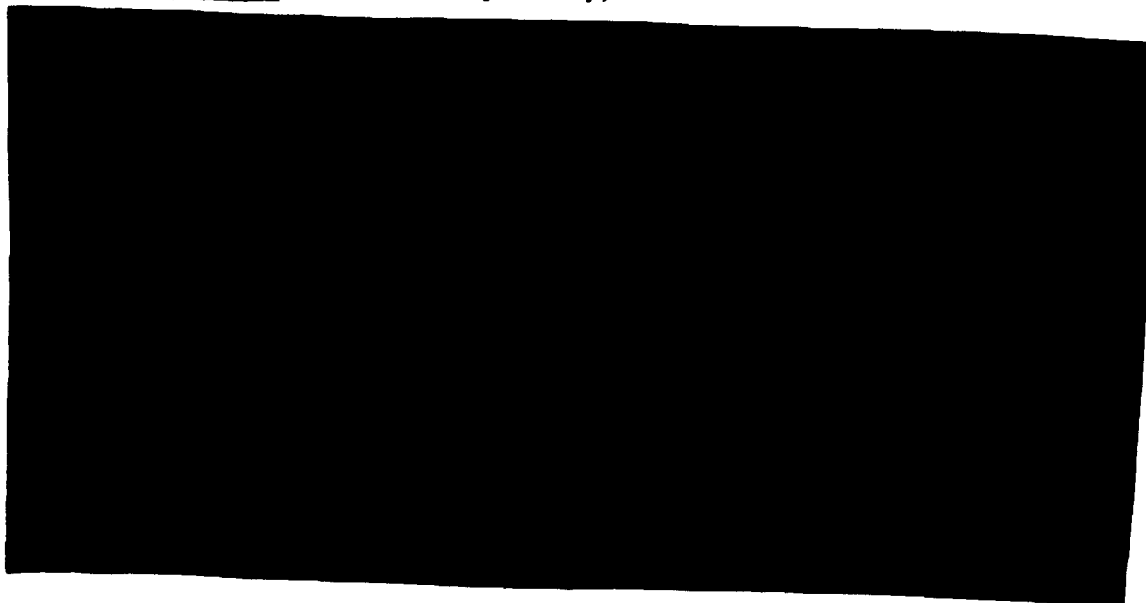
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(U) 5. Deception (in order of priority)



(U) 6. Jamming (in order of priority)



NAVY 3.3(b)(5),(8)

OSD 3.3(b)(4),(5),(8)

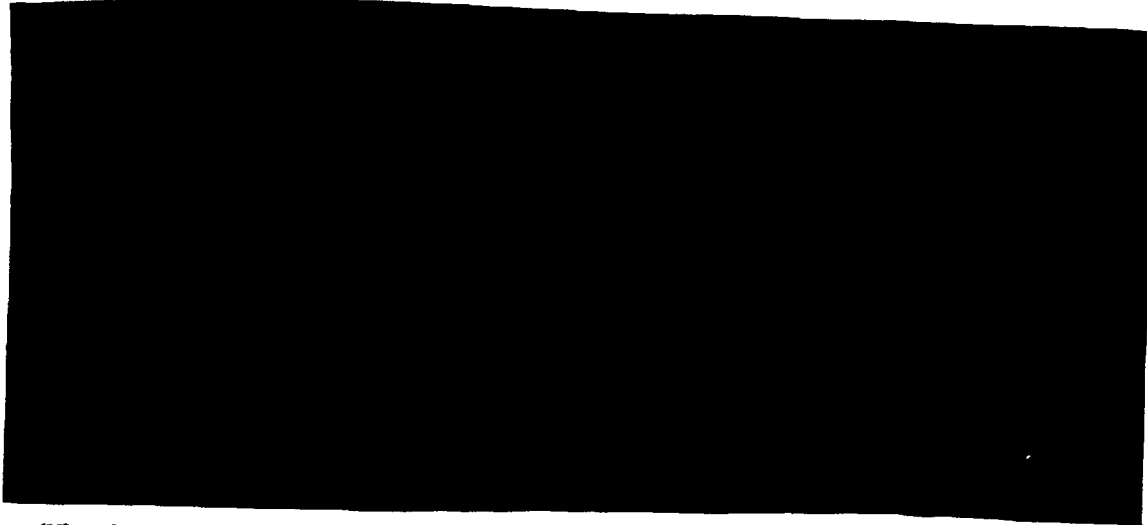
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operational capability and should not be used or implemented as capabilities separated from other weapons (periodically exercised like AAW, ASW, etc.).

(U) 7. Emission Control (in order of priority)

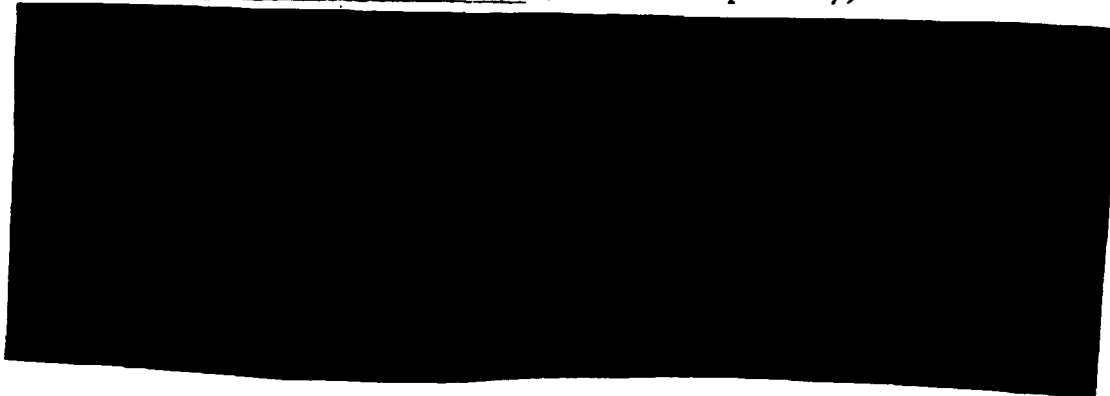


(U) 8. Mine Warfare (in order of priority)

(U) a. The Navy should be supported in its efforts to upgrade and modernize its ocean going mine warfare forces.

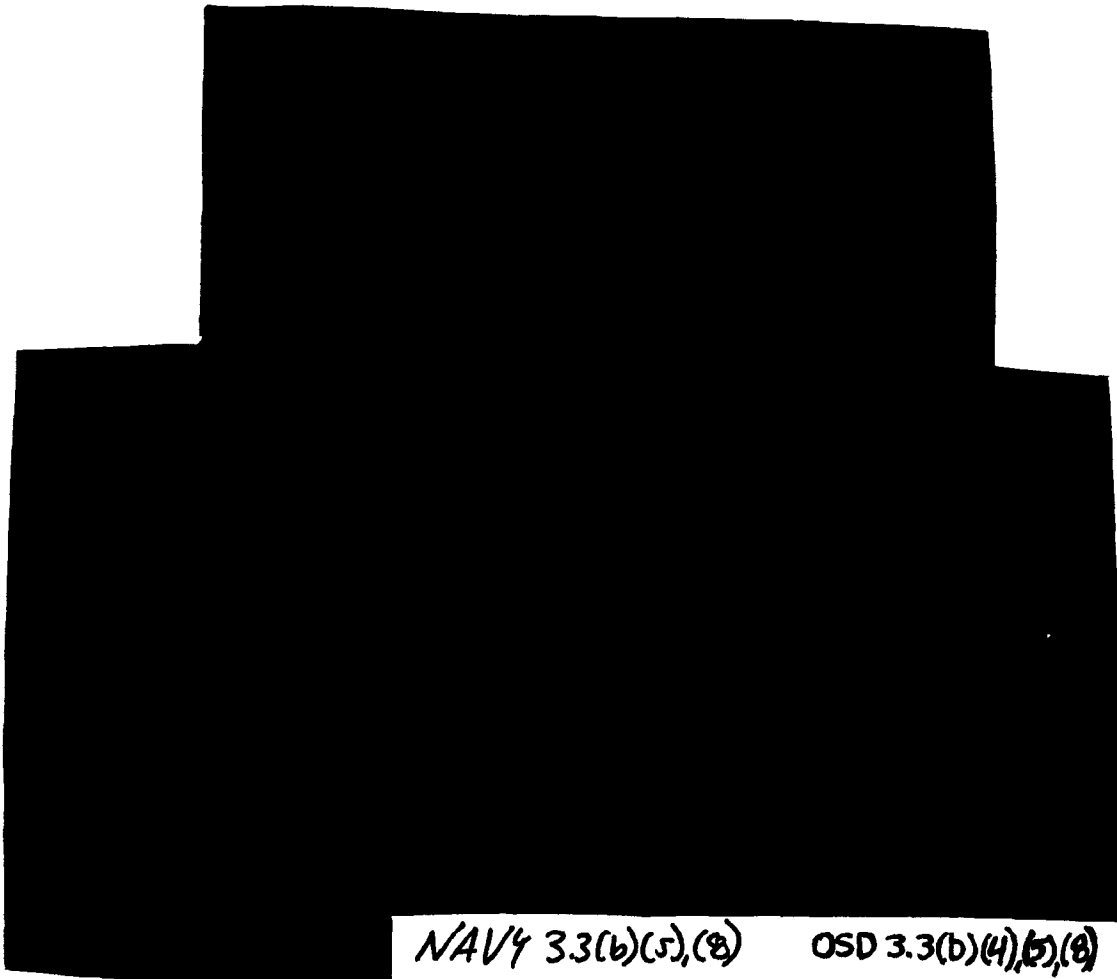
(U) b. The Navy should have more capability to sweep port and coastal areas clear of mines. Allied forces in Europe cannot perform this task in all places needed by the U.S. Navy.

(U) 9. Reduction of Observables (in order of priority)



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NAVY 3.3(b)(5),(8) OSD 3.3(b)(4),(5),(8)

(U) d. Noise Suppression: A useful degree of noise suppression has been attained in the DD-963, and this should be continued. Noise suppression to the degree practiced on submarines is not necessary.

(U) e. Degaussing: Current program is adequate and should be continued.

(U) 10. Passive Protection (in order of priority)

(U) a. Upgrade fire protection and fire fighting equipment and training. Specifically, expand installation of Halon systems in areas such as magazine and engineering spaces.

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[REDACTED]

(U) e. New designs should place a higher priority on redundance of systems and the location of vital spaces below the waterline.

[REDACTED]

(U) g. Retrofit and new ships should have fragment shields on all exposed wave-guides and cabling. Antennae should be hardened or shielded as practical.

[REDACTED]

OSD 3.3(b)(4),(5),(6) NAVY 3.3(6)(5),(6)

(U) j. Build a more complete ship testing facility to routinely test ships against EMP, shock, etc. and institute procedures to put representative ships through the test after each overhaul.

(U) 11. Retrofit Priorities (in order of priority)

(U) Of the potential retrofits reviewed by the Task Force the following have the highest payoff (without requiring major overhaul or extensive changes in standard equipment).

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(U) a. Backfit of launchers into SPRUANCE class destroyers for launch of land-attack and anti-ship SLCM, as well as SM-2 and HARPOON. Launchers should provide for sufficient numbers of SLCM to use conventional warheads, as well as nuclear. This would be an early and significant step toward a "distributed force" concept.

(U) b. Backfit of SLCM launchers aboard cruisers off the CG-26, CG-9, CGN-25/35, CGN-36, and CG-38 classes. Maintain their AAW capability, but provide additional "distributed force" with SLCM, perhaps in lesser numbers than on the SPRUANCE class.

(U) c. Backfit LHA/LPH class ships for an AEW/targeting V/STOL. Use them in support of cruise missile forces to provide AEW/targeting to non-carrier surface attack groups.

(U) d. Upgrade the AAW capability of the DD-963 class: The Task Force is aware of the debate between Navy and various staff elements regarding first; the priority of this upgrade vs. new construction, and second, the relative advantages of an AEGIS derivative vs. competitive models. The Task Force concludes as previously stated, that though the DD-963 AAW upgrade is very important, new construction must take priority at this time. The Task Force feels that it would be grossly non-cost effective to seek a new AAW system that does not take advantage of the lessons learned, technology and system integration work done with AEGIS. An AEGIS derivative system which may concurrently use new solid state technologies is considered to be the best approach. Competitive development of some subsystems involving new solid state technology may be warranted. Under no circumstances should we develop a completely new system with attendant large costs and time delay in deployment.

(U) e. As new deception jamming and emission control devices are built, backfit them on many ships. Avoid the special unit approach toward deception devices and integrate the hardware and knowledge of deception procedures at the ship level.

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- (U) f. Install heat shielding devices to deny an infrared signature.
- (U) g. Institute a workable chemical/biological testing and anti-system.
- (U) h. Install fragment shields on all exposed waveguides and cabling.

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V. RECOMMENDATIONS (U)

- (U) 1. Continue to support the existing funding level for surface ship forces as an irreducible minimum.
- (U) 2. As an immediate action, reprogram five percent of the current shipbuilding budget in support of the survivability items prioritized in this report. See Charts 5 and 6. These funds should be applied to retrofit items and early initiatives supporting a distributed force concept.
- (U) 3. The Navy should strenuously propose and defend a plan to distribute more widely its offensive and defensive capabilities before the conclusion of the POM-82 process. All efforts should be made to increase shipbuilding funds by 30 percent above the current level (in real dollars) over the next five years to establish a "Distributed Force" capability. (See Chart 6.)
- (U) 4. Recognize that as a minimum, naval balance with the Soviets is a necessary part of surface ship survivability. Technology and managerial innovation can provide superiority at the margin, but cannot overcome the trend toward Soviet maritime superiority represented by the large defense investment differential that now exists.
- (U) 5. Take note that certain types of survivability features are not externally evident, and therefore tend to be cut from the budget under pressure to reduce costs. Survivability features should be preserved through specific review of these features by NSARC/DSARC.
- (U) 6. When faced with "either-or" budgetary decisions, decide in favor of force survivability and offensive capability at the expense, if necessary, of single ship survivability features and defensive systems.

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OSD 3.3(b)(4)(5)(6)

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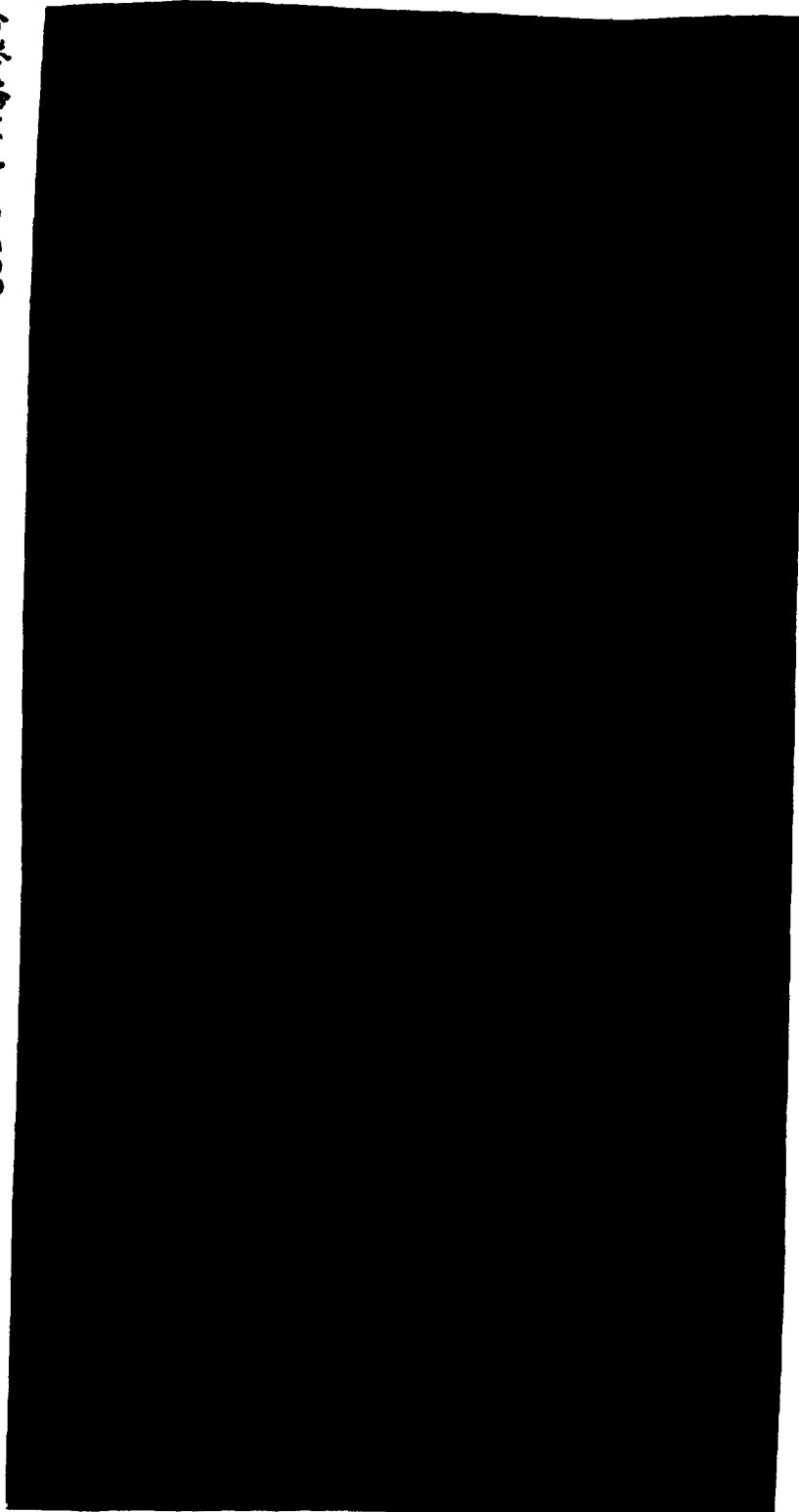
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OSD 3.3(b)(4)(s)(g)

NAVY 3.3(b)(4)(s)(g)



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RESEARCH AND
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APPENDIX A

THE UNDER SECRETARY OF DEFENSE
WASHINGTON, D.C. 20301

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8 DEC 1978

MEMORANDUM FOR THE CHAIRMAN, DEFENSE SCIENCE BOARD

SUBJECT: Defense Science Board Task Force on Naval Surface Ship
Vulnerability (U)

(U) You are requested to organize a Defense Science Board Task Force to review, evaluate and summarize the vulnerability of naval surface ships with consideration of their effectiveness in carrying out future naval missions.

(U) The Task Force report should address the following:

A. Background

OSD 3.3(b)(4)(5)(6)



NAVY 3.3(b)(7)(8)

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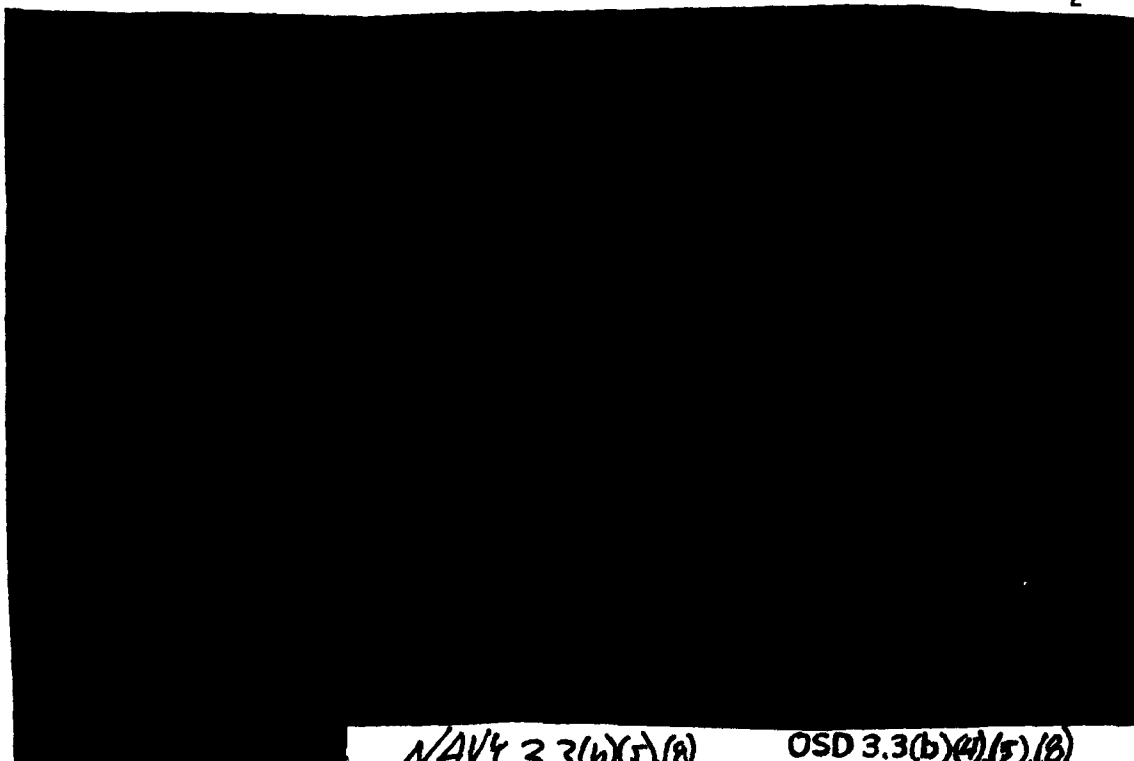
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NAVY 3.3(b)(5)(B)

OSD 3.3(b)(5)(B)

(U) The Task Force will be sponsored by Dr. James P. Wade, Assistant to the Secretary of Defense for Atomic Energy and Assistant for Analysis to the Under Secretary of Defense for Research and Engineering. You are requested to serve as Chairman of this Task Force. Commander Robert C. Powers, USN, Military Assistant to the Defense Science Board, will act as Executive Secretary.

(U) The Task Force should plan to commence its efforts in December 1978, and submit a final report within ten months.

William J. Perry

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APPENDIX B

MEMBERSHIP

DSB TASK FORCE ON SURFACE SHIP VULNERABILITY

Chairman

Dr. Eugene G. Fubini
Consultant

Members

Mr. Norman R. Augustine
Vice President, Technical
Operations
Martin Marietta Aerospace

Mr. Lewis Franklin
Vice President
ESL, Inc.

Dr. Charles M. Herzfeld
Director of Research
ITT Corporation

Dr. Benjamin Huberman
Assistant Director, National
Security & International
Space Affairs
Office of Science and
Technology Policy

Adm. Isaac C. Kidd, Jr., USN (Ret.)
Consultant

Mr. V. S. Kupelian
Associate Deputy Assistant Secretary
of the Navy (Systems Engineering)

Dr. Walter B. LaBerge
Under Secretary of the Army

Mr. Lawrence H. O'Neill
President
Riverside Research Institute

Executive Secretary

Cdr. Robert C. Powers, USN
Military Assistant to the DSB

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APPENDIX C

TOPICS BRIEFED TO THE TASK FORCE

January Meeting

SeaPlan 2000 (Professor West)
Second Generation Cruise Missiles (RAdm. Ekas)
Sea Based Air Study (Mr. Powers)
Plans to Counter Underwater Threat (RAdm. Metzel)

February Meeting

Warship Design as it Relates to Survivability (RAdm. Lisanby)
Defense Against the Quiet Submarine Threat (Dr. Andreasson)
Battle Group Operations (VAdm. McDonald)
Detection, Control and Engagement in Area and Point Defense
Anti-Air Warfare (RAdm. Meyer)

March Meeting

Current Navy Programs Relating to Surface Ship Vulnerability
(VAdm. Doyle)
Navy Jamming and Deception Programs (RAdm. Ince)
Survivability/Vulnerability Features of Soviet Surface Ships
(Mr. Bloom)
Advanced Warship Design with Regard to Survivability
(Capt. Krekle)

May Meeting

Surface Ship Survivability as Indicated by Fleet Exercises
(VAdm. Doyle)
U.S. Naval Vulnerabilities to Soviet Mine Warfare and Mine
Warfare Capabilities and Programs (Capt. Sykes)
U.S. and Soviet Ocean Surveillance and Over-the-Horizon
Capabilities (including Exercise National Week 26)
(RAdm. Snyder)

June Meeting

Individual Ship Vulnerability Problems (RAdm. Bulkeley)

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TOPICS BRIEFED (continued)

July Meeting

CBR (VAdm. Doyle)
Special PSAG Report (Mr. Augustine)

September Meeting

Soft Kill Systems (Dr. Cosby)
Defense Against ARM (VAdm. Doyle)
Surface Combatant Force Level Study (RAdm. Mustin)

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Deputy Secretary of Defense
Office of Science & Technology Policy, White House
Under Secretary of Defense for Policy
Assistant Secretary of Defense (ISA)
Deputy Under Secretary of Defense for Policy
Director, Net Assessment, OSD
Under Secretary of Defense for Research and Engineering
Principal Deputy Under Secretaries of Defense for Research
and Engineering
Deputy Under Secretary of Defense for Research and
Engineering (TWP)
Assistant to the Secretary of Defense (Atomic Energy)
Assistant Secretary of Defense (PA&E)
Deputy Assistant Secretary of Defense (PA&E/GPP)
Chairman, Joint Chiefs of Staff
Director, Joint Staff
Director, J-5
Director, C³S
Members, Defense Science Board
Senior Consultants, Defense Science Board
Members, Defense Science Board Task Force on Surface Ship
Vulnerability

Secretary of the Navy
Under Secretary of the Navy
Assistant Secretary of the Navy (RE&S)
Chief of Naval Operations
Vice Chief of Naval Operations
Commander in Chief, Atlantic
Commander in Chief, Pacific
Commander in Chief, Atlantic Fleet
Commander in Chief, Pacific Fleet
Commander in Chief, U.S. Naval Forces, Europe
Director, Navy Program Planning Office, OP-090
Director, Navy Command and Control, OP-094
Director, Navy Antisubmarine Warfare Programs, OP-095
Director, Navy Systems Analysis, OP-96
Director, Navy Research Development, Test and Evaluation,
OP-098

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Deputy Chief of Naval Operations (Manpower, Personnel and
Training), OP-01
Deputy Chief of Naval Operations (Submarine Warfare), OP-02
Deputy Chief of Naval Operations (Surface Warfare), OP-03
Deputy Chief of Naval Operations (Logistics), OP-04
Deputy Chief of Naval Operations (Air Warfare), OP-05
Deputy Chief of Naval Operations (Plans Policy and
Operations), OP-06
Director of Naval Intelligence, OP-009
Director Navy Surface Combat Systems Division, OP-35
Chief of Naval Material
Commander, Naval Sea Systems Command
Commander, Naval Ship Engineering Center
Executive Director, CNO Executive Panel, OP-00K
Naval Research Advisory Committee

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