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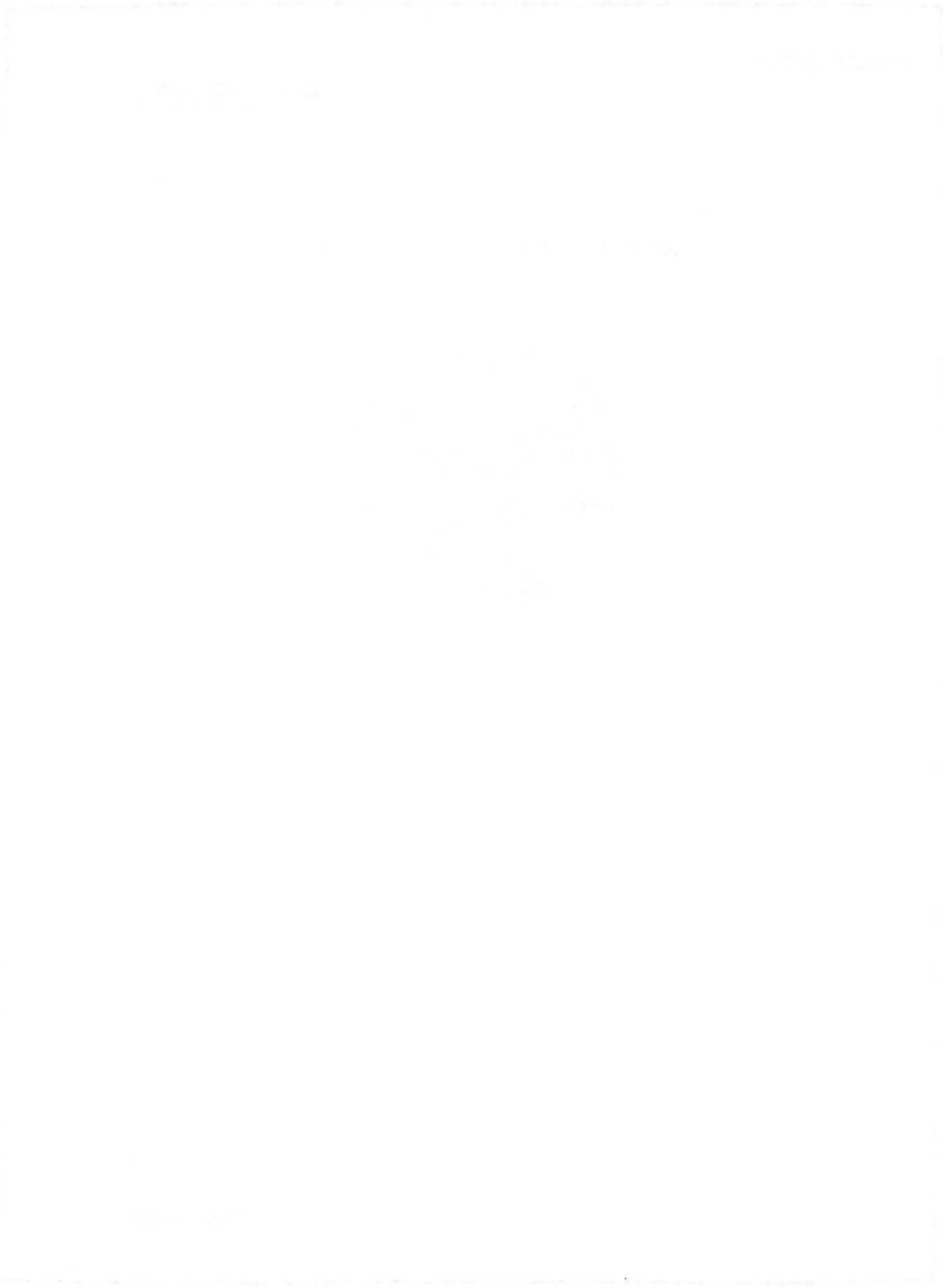
ADO 43-11X

25 AUG 1971

AMPHIB MED SUPPORT SYS DEV



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DEPARTMENT OF THE NAVY
OFFICE OF THE CHIEF OF NAVAL OPERATIONS
WASHINGTON, D.C. 20350

IN REPLY REFER TO
OP-098E/980E/jwh
Ser 697P980
25 AUG 1971

From: Chief of Naval Operations
To: Chief, Bureau of Medicine and Surgery
Subj: Advanced Development Objective 43-11X: AMPHIB MED
SUPPORT SYS DEV
Encl: (1) Abstract of ADO 43-11X
(2) Frame of Reference
(3) Amplifying Data

1. Advanced Development Objective 43-11X, AMPHIB MED SUPPORT SYS DEV, is hereby established.

2. Development Objective Brief. Amphibious warfare operational support concepts have changed considerably in recent years. Recent advances in science and technology can provide for major improvement in the medical support afforded to amphibious operations by developing better medical procedures, techniques, standards, equipment, and facilities. In addition to ensuring better care for the sick and wounded, such improved medical support must provide more effective and efficient means for operational management of medical materiel and manpower resources than have been available in the past. The objective of the required development effort is to produce a fully functional medical support system for amphibious operations involving landing forces up to and including 1 MAF in size. The full medical support system shall be deployable on thirty days notice and capable of completely supporting actions up to six months in duration. This system must provide full integration between afloat and ashore facilities and must include preventive medical services, medical/surgical/dental care services, local and onward medical evacuation and casualty distribution, medical supplies including preserved blood and tissue components, emergency deployment of medical specialists and enlisted personnel from the shore establishment to the operating forces, and operational command and control of the medical support system. The facilities must provide for the mobility, reliability, maintainability, and operational flexibility to render appropriate medical care to 10% of the landing force within any twenty-four hours, and sustained loads of 25% per month. The system must be fully compatible with Joint and

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Combined operations as well as unilateral Navy-Marine operations. Development will be guided by the requirements of the operating forces, advances in scientific and technological capabilities, program progress, cost-effectiveness, and the availability of RDT&E resources. The end items resulting will generally be in the form of new or improved specifications, procedures, techniques, standards, design criteria, prototype medical equipment, prototype technical manuals and computer software. A prototype integrated amphibious medical support system should be available for fleet operational test and evaluation by FY 1977.

3. Harmonization. The unclassified details of this requirement are releasable on a need-to-know basis to the following governments for harmonization purposes: NATO Nations, Australia, New Zealand, Japan.

4. Importance Classification. I-C.



E. E. CHRISTENSEN

Director

Research, Development, Test & Evaluation
Acting

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(REV 7/15/71)

COPY TO:

SNDL PART I

21A FLTCINCS (Less CINCUSNAVEUR)
23B SPECIAL FORCE COMMANDERS (COMASWFORLANT & COMASWFORPAC only)
24 TYPE COMMANDERS (Less 24A, COMINEPAC)
26F OPTEVFORCMDS & DETS (COMOPTEVFOR) (5), & (DEPCOMOPTEVFORPAC)
50A UNIFIED COMMANDS (CINCONAD) (J-5), (CINCAL) (J-62),
(CINCLANT) (J-6), CINCPAC

SNDL PART II

A1 IMMEDIATE OFFICE OF THE SECRETARY (SO-3 only) (2)
A2A INDEPENDENT OFFICES (CNR only) (4)
A4A CHNAVMAT (10)
A5 BUREAUS (CHNAVPER) (5)
A6 CMC (CODE AX) (6)
B2 SPECIAL AGENCIES, STAFFS BOARDS & COMMITTEES (DIR, NSA)
(ADC) (3) & (DIR, DCA) only
C3 NAVAL OFFICERS AT JOINT MILITARY ACTIVITIES (NAVY DEPUTY
DIR, ECAC, Annapolis, Md.) only
C4K PROJMGRS UNDER CHNAVMAT (PM-1) (2), (PM-4) (5)
C4F9 LABORATORY DETACHMENTS (Less Tudor Hill)
E3A LABORATORY ONR (NRL only) (4)
E3B ONEBRO (Less Chicago, Ill.)
FD1 OCEANAV (2)
FD2 NAVOCEANO
FE1 COMNAVSECGRU
FF8 INSPECTION AND SURVEY BOARD (PRES, INSURV only)
FG1 COMNAVCOMM (5)
FH7 NAVMEDRSCHINSTITUTE
FJ20 NAVPERSTRARSLAB
FJ35 NAVPGSCOL
FJ59 NAVPERSRANDLAB
FJ60 NAVWARCOL
FKA1A NAVAIRSYS COMHQ (10)
FKA1B NAVELECSYS COMHQ (12)
FKA1C NAVFACENG COMHQ
FKA1D NAVORDSYS COMHQ (10)
FKA1E NAVSHIPSYS COMHQ (10)
FKA1F NAVSUPSYS COMHQ (5)
FKA6A1 NAVAIRDEV CEN (2)
FKA6A2 NAVWPNSCEN (2)
FKA6A3A NAVSHIPRANDCEN (2)
FKA6A3B NAVSHIPRANDLAB
FKA6A4 CIVENGLAB
FKA6A8 NWL (2)
FKA6A9 NOL (2), (CODE 433)
FKA6A10 NELC (2)

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(continued)

SNDL PART II (continued)

FKA6A11 NAVUSEARANDCEN (2)
 FKA7 NAVTRADEVCCEN (6)
 FKL8 NAVSEC
 FKP1J NAVORDSTA
 FKR3C NAVAIRTESTCEN
 FKR3E NAVWPNEVALFAC
 FKR3J NAVMISCEN
 FS1 NAVINTCOMHQ (NIC-2)
 FS2 NAVSTIC
 FW1 COMNAVSEASERV
 V12 CGMCDEC

OTHERS

OSD (DDR&E) (11), (WSEG)
 JCS (J-5)
 U.S. ARMY (CH, R&D) (2), (AMCRD-X), (COMBAT DEVCCEN)
 U.S. AIR FORCE (DCS, R&D) (3) & (DCS, P&O) (CODE AF/XODL)
 CG MCDEC NLO QUANTICO
 PROJMGERS, CHNAVMAAT (PM-2)

OPNAV

Op-090C	Op-980G	Op-36
Op-90	Op-981	Op-41
Op-093 (3)	Op-982 (6)	Op-05 (2)
Op-094 (7)	Op-985	Op-50 (2)
Op-095	Op-986	Op-52 (3)
Op-96	Op-01	Op-553 (3)
Op-098E	Op-099	Op-60 (2)
Op-098R	Op-02 (2)	Op-62
Op-098T (5)	Op-03	Op-00K
Op-980E (20)	Op-32	Op-00K1
Op-980F	Op-35	

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SECTION ONE

SECURITY CLASS. UNCLASSIFIED	ABSTRACT OF Advanced Development Objective 43-11X	DATE 25 AUG 1971
IMPORTANCE CLASSIFICATION <u>1C</u>		DESIRED IOC DATE <u>Mid 1970's</u>
TITLE AMPHIB MED SUPPORT SYS DEV		
OPERATIONAL NEED Opposed amphibious operations pose tremendous medical problems. Effective early medical support requires marshalling of all available medical resources, afloat and ashore, into a smoothly operating well coordinated medical support system which will function as long as the tactical situation requires. Failure to provide an efficient, reliable system properly integrated with the amphibious task force will contribute to wastage of a most valuable asset, namely, trained personnel.		
DEVELOPMENT DESCRIPTION The capability being developed will demonstrate a solution to medical care and health maintenance problems identified but not satisfactorily resolved in the relatively low-intensity Vietnam conflict, and ensure substitution of technologically advanced medical support for World War II solutions to mid-intensity combat situations, through the design, fabrication and test, of an experimental medical support capability. Highest priority will be given to providing a support system which can cope with changes in amphibious force ship and aircraft composition. Particular attention will be given to the practical solution of medical support problems inherent in the Seaborne Mobile Logistics Concept and the Sea-Basing Concept described in the Mid-Range Marine Corps Operational Plan, 1971 (S). The Amphibious Medical Support System will integrate four subsystems: (1) Casualty Receiving and Treatment Facilities, (2) Patient Movement Vehicles, (2) Amphibious Medical Care, and (4) Amphibious Medical Logistics, into a operationally coordinated capability.		
COMMENTS The Amphibious Medical Support System Development is expected to require about \$6.5M over a 6 year period. The capability will have broad application to military and civilian medicine operating in difficult environments brought about by either military considerations, or natural catastrophic events.		
Op-098 Carl E. Pruett COG OFFICER <u>Capt, MC, USN</u> CODE <u>098E</u> EXT <u>57949</u>		SECURITY CLASS. UNCLASSIFIED

1950

FRAME OF REFERENCE

GOR: 43-Personnel

COG: OP-098E

Interested and Participating: OP-982F, OP-980F6, OP-04H,
OP-415, OP-506N, OP-098TL, OP-098T6, OP-980E42,
OP-100F3, OP-361, OP-371, CMC-AO4

PDA: BUMED

Participating: CGMCDEC, CNM, NAVSHIPSYSCOM,
NAVAIRSYSCOM, NAVELEX, NAVSUP, ONR, BUPERS

Date Operational Capability desired: FY 77

FYDP Element Number: 63706N

RDT&E Cost Estimate: (\$ in Millions)

	FY 72	FY 73	FY 74	FY 75	FY 76	FY 77
Cost Estimate	.250	.750	1.000	1.200	1.500	1.500
FYDP Profile (25 Jun 71)	.254	.750	.750	.750	.750	.800

Related Studies/Requirements:

1. GOR-14 Amphibious Assault (Revised 1967) (C)
2. GOR-41 Logistics (Revised 1970) (U)
3. GOR-43, Personnel (Revised 1970) (U)
4. ADO 43-05X Advanced Medical Development (U)
5. CNR/CND/BUMED Technical Working Group, Amphibious Medical Support System R&D March 1971 (U)
6. CNO Seminar on Amphibious Medical Doctrine, 12-14 August 1970 (S)
7. BUMED Technical Workshop on Amphibious Medicine, 24-28 August 1970 (U)
8. Report of SG's Ad Hoc Committee to study Medical Support of the Fleet Marine Force (1969) (U)
9. Report of SG's Ad Hoc Committee for Improvement of Fleet Marine Medical Support (1968) (U)
10. Mid-Range Marine Corps Operational Plan 1971 (S)
11. NWP 22B Doctrine for Amphibious Operations (U)
12. NWIP 22-1 The Amphibious Task Force Plan (U)
13. NWIP 11-21 Logistic Reference Data (C)
14. CMC Project 90-69-03, Medical and Dental Support Concept for Fleet Marine Forces (mid-range) (U)
15. Medical Capability Survey and Inventory, PHIBLANT October 1970 (U)
16. Navy Strategic Study (NSS-71) (S)



AMPLIFYING DATA

1. The Operational Need

a. Threat. Opposed amphibious operations pose tremendous medical problems which are unequalled in any other type of operation. In the assault phase, the landing personnel are completely exposed to attack during transit to the beach and during debarkation at the beach (or inland points if vertical envelopment is used). Once the beach has been reached, only the most rudimentary capabilities will be immediately available for the treatment of the injured. Effective early medical support will depend upon the quickest possible marshalling of all available medical resources, afloat and ashore, into a thoroughly planned, properly equipped, adequately manned and well coordinated medical support system which will function as long as the tactical situation requires. Failure to provide the best practicable integrated system will contribute to wastage of our most valuable asset, namely, trained personnel. Avoidable high loss of life and limb in successive combat operations could, in addition, well deal a significant blow to the morale of the armed forces and the national will to win.

A CNO sponsored Amphibious Medical Doctrine Seminar conducted in August 1970, supplemented by studies conducted by the Bureau of Medicine and Surgery, delineated the major requirements for medical support capability by the Fleet, and revealed significant shortcomings in that capability. The BUMED Technical Workshop on Amphibious Medicine held in August, 1970, brought together a group of senior managers and users of amphibious medicine to consider current and future requirements and known shortcomings. Deficiencies were identified in six major areas: Requirements, Professional Standards, Personnel and Training, Operations, Evacuation Control, and Medical Materiel Management. A survey and inventory of the medical capability of the ships of the Amphibious Force of the Atlantic Fleet in October, 1970, has provided an up-to-date catalog of the medical and dental capabilities of these ships. These analyses within the last year have served to reinforce the reports of the Surgeon General's Ad Hoc Committee to Study Medical Support of the Fleet Marine Force of 1969, and the Surgeon

General's Ad Hoc Committee for Improvement of Fleet Marine Force Medical Support of 1968.

b. Current Operational Capability. The Fleet possesses a limited amphibious medical support capability which is less than that provided during World War II. The existing facilities, personnel, and technology do not provide the potentially available and required levels of responsiveness, efficiency, flexibility, and cost effectiveness. The Report of the CNR/CND/BUMED Technical Working Group on Amphibious Medical Support System R&D, March 1971, supports the position that a comprehensive project is necessary to accomplish the development which will apply the benefits of modern technology to amphibious medical support in a systematic way.

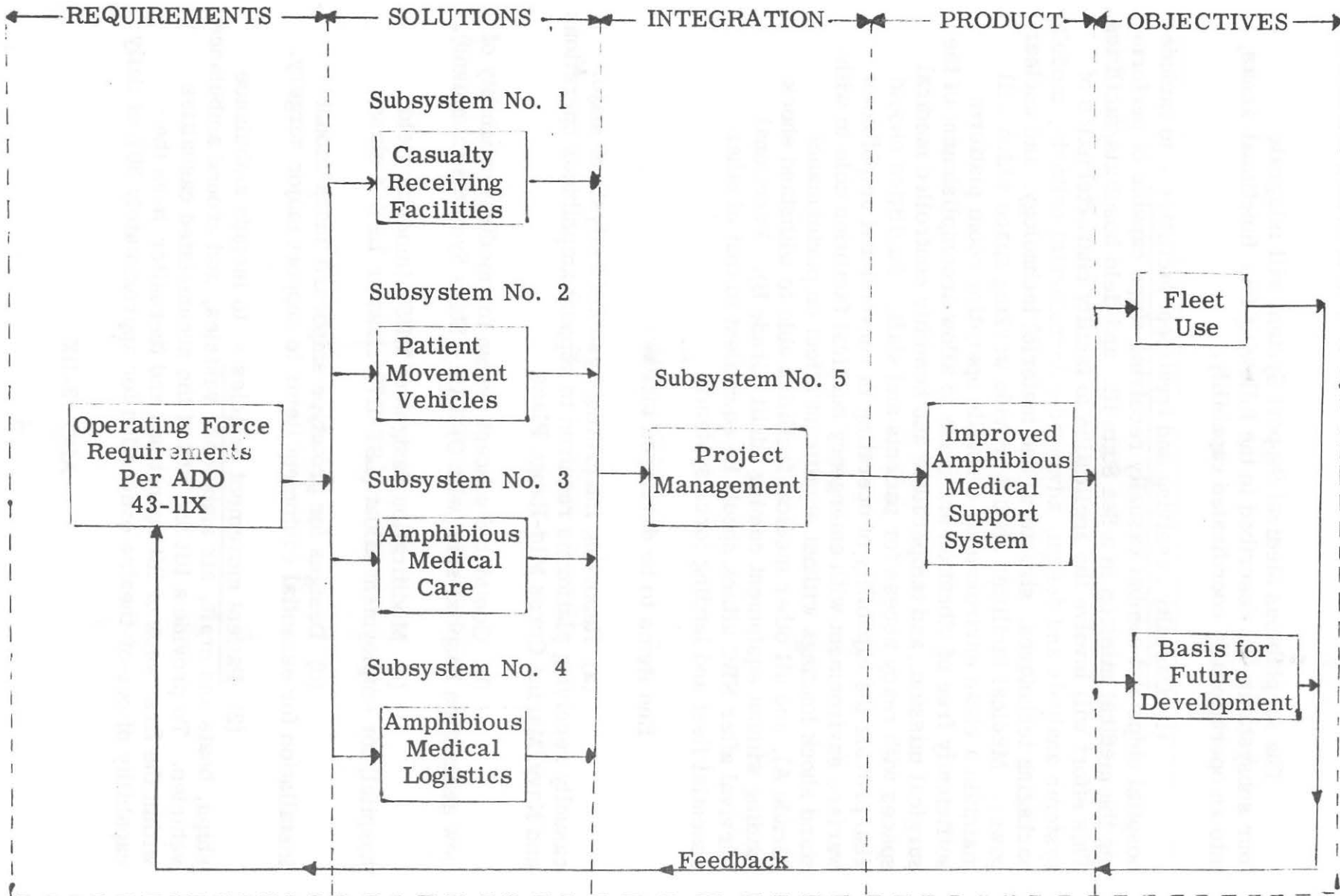
c. Capabilities Under Development. While some improvements in amphibious medical support are coming about gradually by a process of evolution, no comprehensive program for development in this field has been undertaken. The piece-meal approach to development of the required facility, materiel and manpower capability is not satisfactory.

2. Definition of Development.

a. Development Description. The purpose of this Advanced Development is to demonstrate a solution to medical care and health maintenance problems identified but not satisfactorily resolved in the relatively low-intensity Vietnam conflict, and ensure substitution of technologically advanced medical support for World War II solutions to mid-intensity combat situations, through the design, fabrication and test, of an experimental operational medical support capability. Highest priority will be given to providing a support system which can cope with changes in amphibious force ship and aircraft composition. Particular attention will be given to the practical solution of medical support problems inherent in the Seaborne Mobile Logistics Concept and the Sea-Basing Concept described in the Mid-Range Marine Corps Operational Plan, 1971 (S). The structure of the development effort is outlined on the following block diagram:

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The Amphibious Medical Support System will integrate four subsystems, as described in the following four functional areas, into an operationally coordinated capability.

(1) Casualty receiving and treatment facilities - to include hospital ships and combat casualty receiving ships capable of performing the medical mission in a Sea State III, and field hospitals/facilities. This effort will involve the application to facility characteristics of systems analysis and design, advanced environmental criteria, modular packaging techniques, structural and materiel technology, and nuclear power. Medical facilities should provide working space which will maintain a clean environment, a stable operating room platform sufficiently free of vibration and noise to allow accomplishment of the surgical mission, and temperature and humidity controlled medical spaces with ready access for patients and staff. Facilities should also provide the capability of operating in conventional amphibious warfare environment with emergency surgical facilities able to withstand shock loadings without significant effect on performance (Grade A), and all other medical facilities able to withstand shock loading without equipment coming adrift (Grade B). Functional survival after NBC attack should be equivalent to that of other essential fleet and landing force systems.

End items to be developed include:

(a) Reporting integrating systems analysis of major casualty receiving platforms required to support amphibious operations and Navy/Marine Corps Mid-Range Plans.

(b) Completed concept design for medical capability of new generation hospital ship (with OPNAV - Ships Systems Command).

(c) Modification designs of MUST (modular field hospital) for employment afloat (LST-1179 class or LPD-4 class).

(d) Designs for prototype shipboard shock-mount installation for essential equipment items to support major surgery.

(2) Patient movement vehicles - to include ambulance ships, boats and craft, air ambulance vehicles, and ground ambulance vehicles. To provide a lift for 70% of the accumulated casualties within the first week of lift operations and thereafter have the capability of out-of-theatre evacuation for approximately 30% of daily

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casualty load. This effort will involve the application of advanced environmental criteria for shock, noise, vibration, temperature and motion with particular emphasis on high speed vehicles. It will provide for modular life support and medical care equipment compatible with surface and air vehicles of all types.

End items to be developed include:

(a) Report detailing prototype package (personnel, equipment, supplies) to convert new amphibious ship type (LST-1179 class, etc.) to ambulance ships.

(b) Report of analyses of patient embark-debark techniques for new high speed surface craft. Establish requirements for special handling gear if necessary.

(c) Prototype medical equipment/supply package for FMF helicopter ambulances.

(d) Report of analyses of motion stress to patient in new rough terrain ambulance ("Gamma goat").

(e) Report processing doctrine and procedures for out-of-theatre air evacuation from amphibious task force.

(f) Design criteria for ambulance helicopters, surface craft and ground vehicles based on exposure of animals in low blood volume shock to simulated stresses of existing and prototype vehicles.

(3) Amphibious medical care - to include medical materiel, procedures and techniques. This effort will involve the application of advances in preventive medicine techniques, patient handling equipment and techniques, patient treatment procedures, equipment and materiel, patient information and control, and decedent care to casualty regulating and health services. Medical equipment should be miniaturized when practical and ruggedized to have a minimum operating life of 36 months under service conditions. A 90% effective heat acclimatization for embarked troops will be provided. The capability to test the effectiveness of the medical support system through the use of amphibious warfare gaming techniques should be developed.

End items to be developed include:

(a) Prototype suit of modernized laboratory diagnostic

equipment for field/shipboard casualty receiving facilities compatible with field/shipboard power sources.

(b) Prototype intensive care monitoring equipment compatible with field/shipboard power.

(c) Reports detailing prototype surgical support team medical package (air transportable), and mobile neurosurgical team medical package (air transportable).

(d) A medical module design for riverine craft.

(e) A set of heat acclimatization tables with independent variables of garrison climate, transit time and operations area climate versus dependent variables of chamber climate and daily exposure required.

(f) A set of war-game/amphibious exercise guidelines which will provide realistic and reproducible workload stresses for medical support systems, including surgical team trainees and permit rapid assessment of the observed performance.

(4) Amphibious medical logistics - to include operational medical resources command and control system, emergency deployment of medical manpower, high reliability casualty estimation, medical manpower planning, and medical materiel supply. This effort will involve the application of advanced communications techniques, information processing techniques, advanced medical training techniques, and personnel management procedures to provide more effective utilization of medical manpower by the formation of new types of medical/surgical teams, or the modification of existing teams. Improved medical/surgical supply blocks tailored to team needs and compatible with the Seaborne Mobile Logistics Support concept will be developed.

End items to be developed include:

(a) Software for medical resources command and control system utilizing existing and planned Naval Communication and Data Systems. Required modifications of hardware systems to be identified.

(b) Doctrine for emergency deployment of medical

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manpower and support equipment to be on-site within 48 hours of initial request.

(c) Medical evacuation doctrine/procedures/techniques which assures a median evacuation time of 1 hour from wounding to initial surgery for urgent cases in helicopter-permissive combat environments.

(d) Medical evacuation doctrine, procedures and techniques which assures a median evacuation time of 3 hours from wounding to initial surgery for urgent cases when surface evacuation is utilized for all or significant parts of the trip.

(f) A set of short casualty experience tables which will permit calculation of peak surgical requirements in amphibious operations. (Existing standard tables are designed to calculate total bed requirements and not peak surgical loads.)

b. Development Concepts.

(1) Emphasize an integrated medical support system capable of supporting the full spectrum of activities required to adequately provide health maintenance and medical care services to an amphibious task force in a mid-intensity combat situation, and capable of functioning at anchor in Sea State III and underway at a speed of 20 knots.

(2) Utilize the system approach to improving the quantity and quality of medical support capability in terms of military usefulness, operational reliability, and cost effectiveness.

(3) Apply "state of the art" advances in medical technology to the amphibious warfare environment through the use of appropriate techniques, such as computerization, miniaturization, ruggedization, modularization and system design.

c. Performance Constraints. Improvement in the quantity and quality of medical support will be achieved within the constraints of trained medical manpower available in the time period being considered. Performance improvement, as targeted, based on World War II, Korea, and Vietnam experience, is expressed in the following terms.

(1) A 50% reduction in mortality rate of wounded personnel reaching forward treatment facilities (reduction from 2% to 1%).

(2) A 25-50% reduction in lost time due to injuries/illness not requiring out-of-the-theatre evacuation.

(3) A 25% improvement in facility space utilization and work flow.

(4) A 50% improvement in speed and safety of patient handling.

d. Reliability, Maintainability and Human Compatibility. The integrated medical support system should be designed with optimum man/machine interfaces, be easily maintainable, and highly reliable in operation. The support system provided must be fully acceptable to medical department personnel providing services and to personnel receiving the services. The system must have the capability of being quickly and easily updated or modified as medical technology advances, or the warfare environment changes.

e. Related Army, Air Force and Marine Corps Requirements. This development will be coordinated with the Army, Air Force and Marine Corps through the DDR&E Joint Medical Research Advisory Conference, the Interagency Life Sciences Exchange, and the National Research Council Committee on Naval Medical Research.

f. Related Foreign Requirements or Developments. No related foreign developments can be identified. Logically, every nation that operates amphibious forces has a general requirement for the subject capability.

3. Evaluation and Review.

The test and evaluation phases of this development will include demonstrations either in simulated or operational situations of the comparative improvement in medical support resulting from the application of the new information and technology. These demonstrations will be so designed as to provide for the maximum use of quantifiable criteria and measures of technical and financial acceptability.

4. General.

a. In any instance where delay in the attainment of a particular milestone threatens the orderly progress of a project or a major task within the element, the developing agency will immediately advise the Chief of Naval Operations and submit appropriate alternate remedial recommendations.

b. Upon receipt of such information and recommendations, the CNO will make decisions as to further courses of action including whether or not to proceed to full system development if appropriate.

5. Security Classification Guidance. The result of this development effort is unclassified.

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