Department of the Navy

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RDT&E / Acquisition Management Guide

11th Edition

RDT&E/Acquisition Management Guide

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January 1989

NAVSO P-2457 (Rev. 1-89)

THE ASSISTANT SECRETARY OF THE NAVY
(RESEARCH, ENGINEERING AND SYSTEMS)
WASHINGTON, D.C. 20350-1000

23 January 1989

FOREWORD

The 1989 edition is the eleventh printing of the Department of the Navy RDT&E/Acquisition Guide, published originally in 1964.

The Guide's purpose remains as it always has been, to help participants in Department of the Navy RDT&E understand the overall process and identify specific directives which provide current guidance. The Guide itself is not a directive and cannot be cited as authority for official actions. The Guide includes directives in effect as of 30 November 1988.

Major changes reflected in this edition of the Guide include the restructuring of the Office of the Under Secretary of Defense for Acquisition, the restructuring of the Navy headquarters organization pursuant to the Goldwater-Nichols Reorganization Act of 1986, and various changes effected by the reissuance of the DOD and Navy Directives 5000.1 on Major Systems Acquisition.

The process is dynamic, and it is likely that reform of acquisition procedures by the Congress and the Executive Branch will continue. Appendix A includes a number of recent documents indicative of such actions.

Additional copies may be obtained from USNPFC, Philadelphia (see ordering instruction on page vi). Contractors and other non-military users may purchase the Guide through the office of the Superintendent of Documents, U.S. Government Printing Office.

Recommendations for additions, deletions and corrections, as well as any related opinion you may have, are welcomed and should be forwarded to my office.

Tom Faught

THOMAS F. FAUGHT, Jr.

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For the next edition

Submit requests to be placed on the distribution list, or for changes in the number of copies through automatic initial distribution, to the Office of the Chief of Naval Research (Attn: OCNR 011AO), 800 N. Quincy St., Arlington, VA 22217-5000.

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LIST OF EXHIBITS

FLOW CHARTS

PREFACE

The Navy's Management Guide for research, development, test and evaluation acquisition activities serves both as an introduction to newcomers and as an aid to R&D procurement professionals. For newcomers, the Guide provides a comprehensive understanding of the Department of the Navy's research and development management system. For the professional, it is a rapid reference to general information and a summary of directives which contain fully developed and authoritative data on specific subjects.

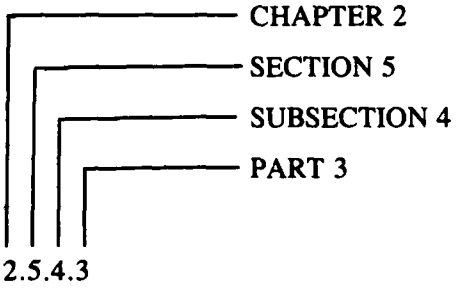
It must be emphasized that this is a Guide. It is not a directive or a compilation of directives, notices, laws, or instructions. Neither is it to be cited as an authority for action. The Guide explains and supplements directives and places them in perspective to provide the reader an understanding of the overall system. It also identifies directives and similar materials applicable to specific subjects and phases of the system. The reader is encouraged to consult the specific directive for a more comprehensive understanding of current status and to obtain official guidance.

Applicable directives, instructions and so forth are identified following each portion of the Guide. Those relating to an entire Section, such as Section 1.6, "Program Management," are outlined immediately following the introduction of the Section. References considered of greatest importance to each Chapter are indicated at the conclusion of that Chapter. The Appendixes also include a master reference list.

Content and Organization

The Guide is outlined in seven Chapters and ten Appendixes. Chapters cover organization, planning, programming, budget preparation and execution, acquisition management and test and evaluation. All appendixes contain important information. However, the reader should give early attention to Appendix F, for an understanding of the Navy's acquisition process is mandatory to comprehending and working with the system.

To assist in locating desired information rapidly, both a comprehensive Index and a detailed Table of Contents are provided; the latter preceding each Chapter. Index and Table of Content citations are presented primarily by location number rather than page number. For example, the definition of Milestone II is found at 2.5.4.3, indicating that this subject will be found as follows:



For ease in locating referenced paragraphs, the last and first paragraph numbers which appear on odd and even pages, respectively, are indicated at the top outer corner of those pages. The location number of material in an Appendix is preceded by the Appendix letter, e.g., E1.1.2.

The newcomer to research and development acquisition management, the audience for which this Guide primarily is intended, undoubtedly will experience difficulty with numerous acronyms and abbreviations. Unfortunately, they are the "tools of the trade"—the jargon of the culture—and must

be understood! The reader is well advised to gain a very early familiarization with these abbreviations and terms. The first time an acronym or abbreviation appears in the Guide, it will be preceded by the complete phrase or expression. Also, all acronyms and abbreviations used in this eleventh edition, will be found in alphabetical order inside the front and rear covers of the Guide.

Revisions, Expansion and Reader Comments

The research and development acquisition process is dynamic—responding constantly to changes and improvements in the management structure, controls mechanism and systems procedures. Thus, it is important to appreciate that the Guide also is dynamic with possible near-term modifications indicated even in this edition.

Readers, be they newcomers or professionals, are asked to be analytical and critical in reading this material, and to provide their criticisms and recommeded changes. Less specific comments—especially indications that certain portions appear weak, for whatever reason—will be useful and are greatly encouraged. Please direct such comments to:

Assistant Secretary of the Navy-
Research, Engineering & Systems ATTN:
RDA Management Guide Staff The
Department of the Navy The Pentagon, Suite
4E732 Washington, D.C. 20350-1000

Chapter 1
ORGANIZATION FOR RDT&E

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Chapter 1
ORGANIZATION RELATIONSHIPS

This chapter discusses the Research, Development, and Acquisition (RDA) organization. It is a general overview, focusing primarily on the fundamental responsibilities of principal agencies, departments and executives, and, more importantly, in broad terms how they work together to get the job done.

The organization information in this chapter provides the reader background on the subject. Organization, to a greater or lesser degree, is addressed in most chapters inasmuch as a principal objective of the Guide is to explain "who does what" and how groups are structured to carry out their specific RDA functions. More comprehensive organization data also is provided in the major appendixes.

1.1 FUNCTIONS OF THE DEPARTMENT OF DEFENSE

Navy research and development and acquisition is a systematic process by which the Department assures the Naval Forces that they will have weapons, equipment, munitions, systems and support items in a timely and effective fashion. In turn, by assuring that the Navy and Marine Corps are equipped for optimal mission effectiveness, RDA provides the means for supporting the overall mission of the Department of Defense (DOD).

In pursuing Navy research and development and acquisition work, therefore, it is useful to keep firmly in mind that the Department of Defense maintains armed forces-including the Navy and Marine Corps-to perform the following paramount functions.

- Support and defend the Constitution of the United States against all enemies, foreign and domestic.
- Ensure, by timely and effective military action, the security of the United States, its possessions and areas vital to its interest.
- Uphold and advance the national policies and interests of the United States.

Ref.: DOD Directive 5100.1 (SECNAV Instruction 5410.85)

1.2 RESEARCH, DEVELOPMENT, TEST & EVALUATION RESPONSIBILITIES OF THE OFFICE OF THE SECRETARY OF DEFENSE

1.2.1 Under Secretary of Defense. Department of Defense functions and those of its departments and agencies are carried out under the direction, authority and control of the Secretary of Defense (SECDEF). The SECDEF serves under the direction of the President, who, as Commander-in-Chief of the Armed Forces, is responsible for final broad military decisions.

Ref.: DOD Directive 5100.1 (SECNAV Instruction 5410.85)

1.2.2 Under Secretary of Defense (Acquisition). The Under Secretary of Defense for Acquisition (USD(A)) is the SECDEF's principal staff assistant and advisor for all matters relating to research and

development, production, logistics, Command, Control, Communications, and Intelligence concerning acquisition and procurement and military construction.

The USD(A) position was established by the FY 1987 Authorization Act (P.L. 99-661). Additional legislation regarding this office, which was contained in the Goldwater-Nichols Defense Reorganization Act of 1986, implemented certain recommendations of the President's Blue Ribbon Commission on Defense Management, otherwise known as the Packard Commission (see E1.1).

Principal functions and responsibilities of the Under Secretary of Defense include:

- Setting Acquisition policy.
- Supervising the DOD Acquisition system.
- Serving as Defense Acquisition Executive (DAE) (see 1.2.3).
- Chairing the Defense Acquisition Board (DAB) (see 2.5.6.2; E9.2).

Ref.: DOD Directive 5134.1

1.2.2.1 Director, Defense Research and Engineering. The Director, Defense Research and Engineering (DDR&E), is the principal staff assistant and advisor to the USD(A) for DOD scientific and technical matters, basic and applied research, environmental sciences, the development of weapon systems and appropriate international agreements.

1.2.2.1.1 Deputy Director, Strategic and Theater Nuclear Forces. The Deputy Director, Strategic and Theater Nuclear Forces (DDS&TNF), is the principal assistant to the DDR&E for the technical review, evaluation, and oversight of all DOD development and acquisition programs in the mission areas of Strategic Offense, Strategic Defense, Theater Nuclear Forces, Space Launch Systems, Arms Control and Compliance, and relevant allied cooperative programs.

1.2.2.1.2 Assistant to the Secretary of Defense (Atomic Energy). The Assistant to the Secretary of Defense (Atomic Energy) (ATSD(AE)), is the principal staff assistant to DDR&E for Defense atomic energy matters, and is responsible for (1) nuclear and chemical weapons safety, security, and survivability; (2) nuclear survivability of strategic and theater nuclear forces and associated systems; (3) chemical and biological survivability of all DOD material; and (4) planning and implementation of modernization and upgrading of the nuclear and chemical weapons stockpile. ATSD(AE) also serves as the single OSD focal point with responsibility for integrated management of all chemical and biological defense and chemical stockpile destruction matters within DOD.

Ref.: DOD Directive 5148.2

1.2.2.1.3 Deputy Director, Test and Evaluation. The Deputy Director, Test and Evaluation (DDT&E), is the principal staff assistant to DDR&E for all test and evaluation matters, excluding Operational Test and Evaluation (OT&E). This official is responsible for formulating T&E policy, approving the T&E Master Plans (TEMP) (see 7.5.3) and assessing test and evaluation results for the DAB (see 2.5.6.2; E9.2).

1.2.2.1.4 Deputy Director, Research and Advanced Technology. The Deputy Director, Research and Advanced Technology (DDR&AT) advises DDR&E regarding the Department of Defense's commitments to Research, Exploratory Development and non-systems-oriented Advanced Development, i.e., in large part, "Tech Base" activities.

1.2.2.1.5 Deputy Director, Tactical Warfare Programs. The Deputy Director, Tactical Warfare Programs (DDTWP), is the principal assistant to the DDR&E for research and

development of system specific items of equipment employed by conventional or tactical forces, but not involving equipment end items pertaining to EW, BW/CW, tactical nuclear or special operations forces.

1.2.2.2 Assistant Secretary of Defense (Command, Control, Communications, and Intelligence). The Assistant Secretary of Defense (Command, Control, Communications, and Intelligence) is the principal staff assistant and advisor to USD(A) for DOD command, control, communications, and to the Deputy Secretary of Defense for intelligence policy, requirements, priorities, systems, resources, and programs, including related warning and reconnaissance activities and including those National Programs for which the Secretary of Defense has execution authority.

Ref.: DOD Directive 5137.1

1.2.2.3 Assistant Secretary of Defense (Production and Logistics). The Assistant Secretary of Defense for Production and Logistics (ASD(P&L)) is responsible to the USD(A) for managing DOD's acquisition, logistics, installations, associated support functions, and other related activities. The ASD(P&L) is a principal member of DAB.

Ref.: DOD Directives 5128.1 and 5000.49

1.2.2.4 Director, Program Integration. The Director, Program Integration (DPI), reports directly to the USD(A) and provides overall programmatic support for all of OUSD(A) in the following areas: OUSD(A) Congressional activities including Congressional hearings scheduling, Congressional transcripts, witness statements and reports due to Congress; budgetary matters including budget review, apportionment, cost reporting and financial execution; management policies and procedures governing the operations of the DOD Acquisition Systems; major acquisition management directives; management of the DAB; oversight of the ten acquisition committees making recommendations to the DAB; coordination of DOD joint programs.

1.2.2.5 Deputy Under Secretary of Defense (Industrial and International Technology). The Deputy Under Secretary of Defense (Industrial and International Technology) (DUSD(I^2T)) is responsible to USD(A) for industrial strategic planning to provide industrial support for military operations and for implementing and managing policies and programs to strengthen international cooperation in research, development, and acquisition, including technical review of technology exports for the DOD.

1.2.3 Defense Acquisition Executive. Each department or agency charged with acquisition and procurement duties is required under provisions of the Office of Management & Budget (OMB) Circular A-109 to establish the position of "Acquisition Executive" to integrate, unify and monitor the application of the organization's acquisition process for major systems. The Under Secretary of Defense (Acquisition) is the Defense Acquisition Executive (DAE) and, in this capacity, serves as the Secretary of Defense's principal advisor for the acquisition of major defense weapons, systems and equipment (see E1.2).

Ref.: DOD Directive 5000.1

1.2.4 Assistant Secretary of Defense (Program Analysis and Evaluation). The Assistant Secretary of Defense (Program Analysis and Evaluation) (ASD(PA&E)) develops policies and provides guidance on which planning and program

projections are based and evaluates plans, programs and budget submissions and assesses alternative programs. The ASD(DA&E is a permanent member of the DAB (see E1.5).

Ref.: DOD Directive 5141.1

1.2.5 Director, Operational Test and Evaluation. The Director, Operational Test and Evaluation (DOT&E) is the Secretary of Defense's principal staff assistant and advisor on operational test and evaluation. This official prescribes policies and procedures for DOD-wide OT&E, and monitors compliance (see H2.2).

Ref.: DOD Directive 5141.2

1.3 JOINT CHIEFS OF STAFF

The Joint Chiefs of Staff (JCS) constitute the Secretary of Defense's immediate military staff. The Chairman of the JCS is the principal military advisor to the President, the Secretary of Defense and the National Security Council. The Chairman acts as spokesman for Commanders of the Unified and Specified Combatant Commands, especially regarding operational requirements. He is responsible specifically for assessing defense acquisition program requirements.

Ref.: DOD Directive 5100.1 (SECNAV Instruction 5410.85)

1.4 RESEARCH, DEVELOPMENT AND ACQUISITION RESPONSIBILITIES OF THE DEPARTMENT OF THE NAVY

The fundamental objectives of the Department of the Navy relate directly to its research, development, test and evaluation and acquisition responsibilities. These fundamental objectives are:

- To organize, train, equip, prepare and maintain a high degree of readiness of Navy and Marine forces for the performance of military missions as directed by the President or the Secretary of Defense.
- To support Navy and Marine forces, and the forces of other military departments as directed by the Secretary of Defense which are assigned to unified or specified commands. Support to include personnel, material, administrative and fiscal resources and technology through research and development efforts.

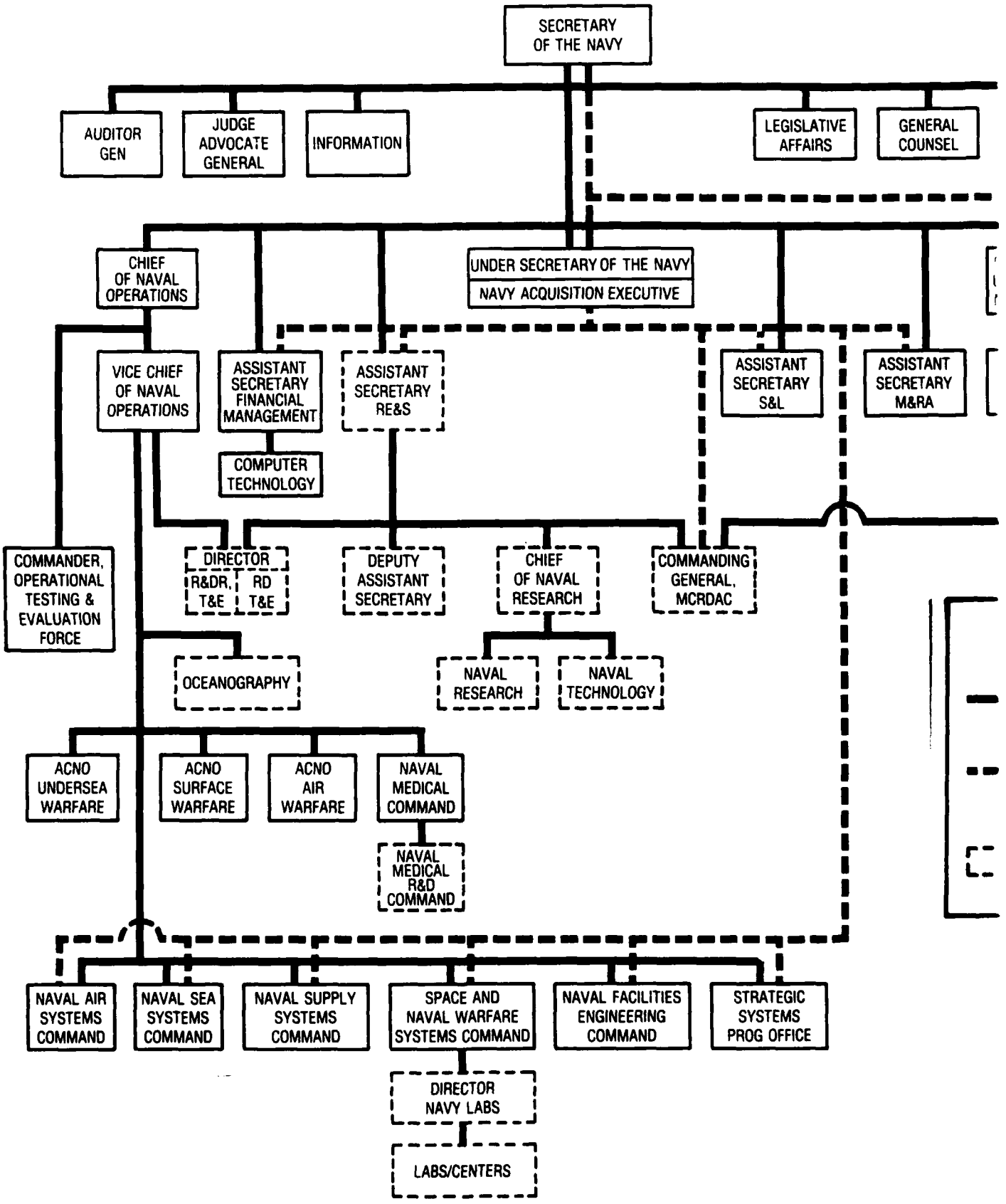
The Department of Navy is organized in a matrix, in which reporting relationships for R&D policy and Acquisition policy and practices are different, but complementary. The present DON organization structure for R&D and acquisition is shown in Exhibit 1-1.

Ref.: SECNAV Instructions 5430.7, 5430.67 and 5430.95

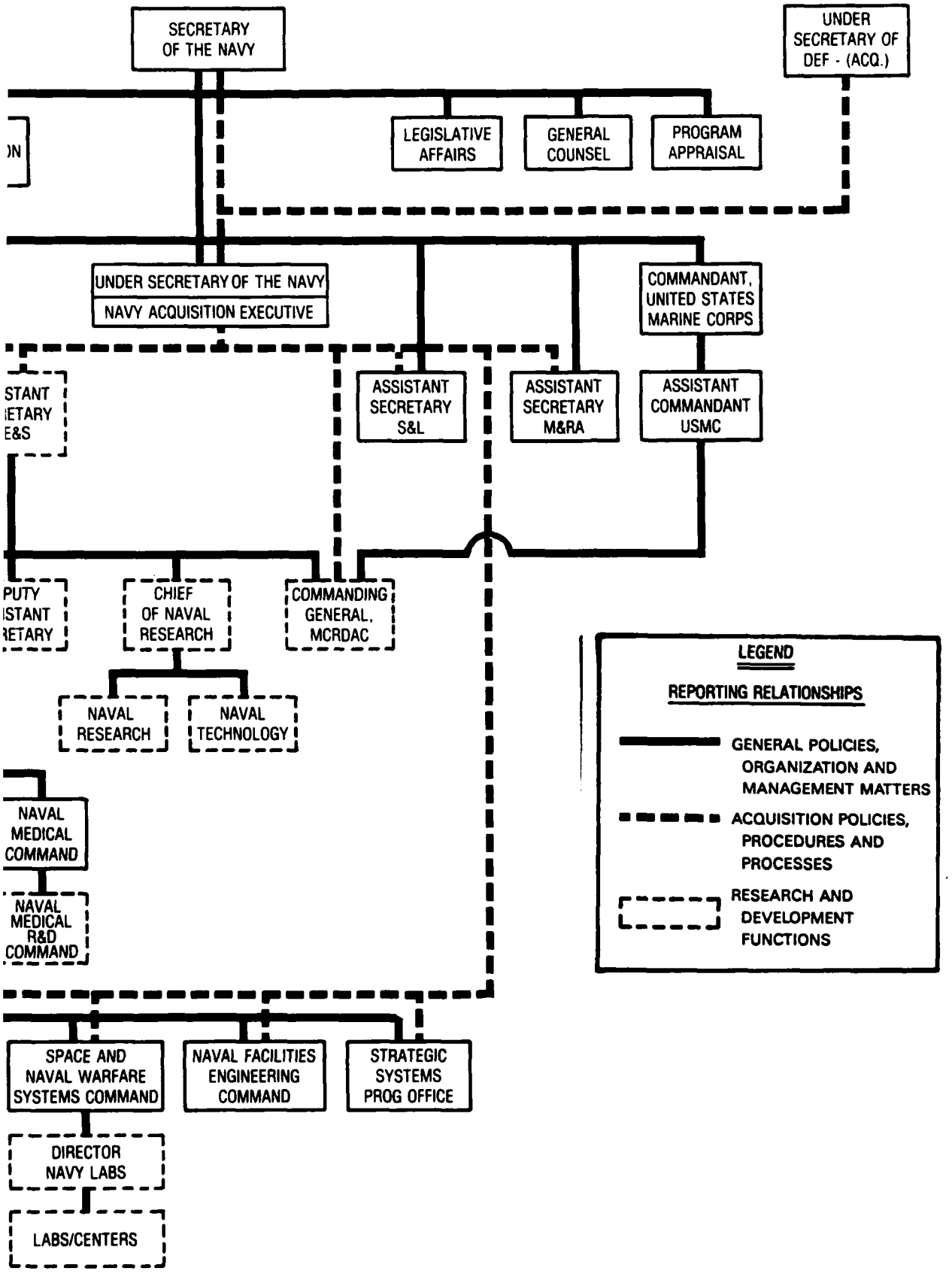
1.4.1 Secretary of the Navy. The Secretary of the Navy (SECNAV) heads the Department of the Navy under the direction, authority and control of the Secretary of Defense. SECNAV is responsible for the policies and control of the Department of the Navy, including its organization, operations, administration and efficiency, and for assuring that the Navy has an effective research, development, test and evaluation program.

Ref.: DOD Directive 5100.1 (SECNAV Instruction 5410.85)

1.4.2 Under Secretary of the Navy. The Under Secretary of the Navy (USN), as the appointed



NOTE: NAVY SYSTEM COMMANDS ALSO RESPONSIVE TO THE COMMANDANT, USMC FOR MARINE CORPS NEEDS.



TO THE COMMANDANT, USMC FOR MARINE CORPS NEEDS.

Exhibit 1-1
Department of the Navy Headquarters
Organization for RDT&E
(Principal RDA Elements Highlighted)

Navy Acquisition Executive (NAE), is responsible for Navy-wide acquisition management, planning and control, including acquisition related to research, development test and evaluation. As the designated Navy Acquisition Executive, the USN has reporting to him directly the Program Executive Officers (PEOs) within the Navy System Commands, Strategic Systems Project Office and the Marine Corps R&D Acquisition Command. He also, as assigned by the SECNAV, carries out duties assisting the Secretary of the Navy.

Ref.: SECNAV Instruction 5000.1

1.4.3 Assistant Secretary of the Navy (Research, Engineering & Systems). The Assistant Secretary of the Navy for Research, Engineering and Systems (ASN(R,E&S)) is responsible to the SECNAV for RDT&E policies, practices, procedures, organization and control, and, to the USN, as the designated NAE, for acquisition matters relating to research and development through Full Scale Production transition, except for activities relating to ships funded by the appropriation "Shipbuilding and Conversion, Navy." The ASN(R,E&S) has overall responsibility for the effectiveness of Navy-wide research and development, including oversight management of the Office of Naval Research.

The ASN(R,E&S) manages the "Research, Development, Test and Evaluation, Navy" (RDT&E,N) appropriation. This responsibility gives this position far more control over the Navy's programs in his area than normally exercised by executives at the Secretarial level. The ASN(R,E&S) is the only civilian executive assistant to the Secretary of the Navy with control of an appropriation.

Three directorates have been established within the Office of the ASN(R,E&S) to support the Assistant Secretary in carrying out his responsibilities.

- A directorate headed by the Principal Deputy Assistant Secretary of the Navy (PDASN) responsible primarily for developing and implementing policies and for assisting the ASN (R,E&S) in assuring civilian oversight of Navy's research and development activities.
- A directorate headed by the Director, Research, Development, Test and Evaluation (DRDT&E) responsible for managing the R&D process and related acquisition activities under the direction of the ASN(R,E&S). Under the additional title of Director, Research and Development Requirements, Test & Evaluation (DR&DR,T&E) the Director, RDT&E reports also to the Office of the Chief of Naval Operations, providing advisory and staff support to the CNO concerning military research and development matters (see 1.4.6.1).
- A directorate headed by the Commanding General, Marine Corps Research, Development and Acquisition Command (CG,MCRDAC), responsible for managing Marine Corps land warfare research and development and acquisition functions (for the parallel duties of the CG,MCRDAC, in the Marine Corps see 1.4.7.1). The CG, MCRDAC, also serves as the Program Executive Officer (PEO) for the Marine Corps and, when acting in this capacity, reports directly to the USN (see 1.4.8.2).

The ASN(R,E&S) has no management or control authority or responsibility for, or civilian oversight over, the research and development aspects of Navy Laboratories, oceanography or computer technology. These responsibilities, respectively, are those of the Systems Commands, the Office of the Chief of Naval Operations and the Office of the Comptroller. However, the ASN(R,E&S) is responsible for assuring that appropriate executives within their functional

areas are apprised of ongoing RDT&E activities, and, particularly as concerns "mission-critical," embedded computer technologies, assuring that the Office of the ASN(R,E&S) is kept advised as to developments, status and so forth.

Ref.: SECNAV Instructions 5430.7, 5430.67 and 5430.95

1.4.4 Chief of Naval Research. The Chief of Naval Research (CNR) heads the Office of the Chief of Naval Research (OCNR), and is responsible for the Department of the Navy Research (6.1) and Exploratory Development (6.2) Programs. The Chief of Naval Research reports to the Assistant Secretary of the Navy (Research, Engineering and Systems) and, through him, is responsible to the SECNAV. He is the ASN(R,E&S)'s principal advisor on 6.1 and 6.2 technology matters.

The CNR, a post acknowledged in law at the conclusion of World War II, is responsible for policy and guidance in planning and implementing the Department of the Navy's research and exploratory development programs, which, taken together, comprises most of the Navy's "Tech Base" activities. In addition, he is responsible for executing the research function as well as related work as specified in various SECNAV instructions. The CNR also serves as a technology advisor to the CNO and to the CMC, and is responsible to the CNO for effective direction and oversight of the execution of exploratory development activities.

The Office of the Chief of Naval Research consists of two offices: the Office of Naval Research (ONR) and the Office of Naval Technology (ONT). E7 contains additional data on the OCNR organization.

While directly responsible only for the Naval Research Laboratory and the other OCNR laboratories listed in G3, CNR is responsible for maintaining contact with the Director of Naval Laboratories and keeping apprised of laboratory activities.

Ref.: SECNAV Instructions 5430.20 and 5430.67; OCNR Instruction 5430.1, Organization Manual

1.4.5 Assistant Secretary of the Navy (Shipbuilding and Logistics). The Assistant Secretary of the Navy (Shipbuilding and Logistics) (ASN(S&L)) is responsible to the SECNAV for research and development of ships, tactical submarines and other vessels (excluding fire control and related systems), for all production activities, i.e., post Milestone III activities (see 2.5) and for support functions for the Navy and Marine Corps. As the designated Navy Senior Procurement Executive, the ASN(S&L) also reports to the USN in his capacity as NAE for acquisition matters. The ASN(S&L), in performing his responsibilities, provides assistance and staff support to the CNO and the CMC (see 1.4.6 and 1.4.7).

Ref.: SECNAV Instructions 4200.29 and 5430.96; Executive Order 12353 and USC 414

1.4.6 Chief of Naval Operations. The Chief of Naval Operations (CNO) is responsible for supervising all functions of the Operating Forces and shore activities of the Navy, including the Systems Commands and all other naval materials activities (see E3).

In the overall division of responsibilities within the Office of the Chief of Naval Operations for developing future operational capabilities, the CNO primarily is concerned with identifying the most valuable capabilities, while the Systems Commands and other research and development

and acquisition organizations determine how such capabilities are to be achieved. In carrying out these responsibilities, the Office of the Chief of Naval Operations' duties center on the following:

- Define requirements essential to current and future mission capabilities of the Navy's operating forces.
- Evaluate the military worth of capabilities which advancing science and technology make potentially attainable.
- Appraise research and development plans and efforts in terms of their possible cost versus military worth.

Ref.: OPNAV Instruction 5430.48

1.4.6.1 Director of Research and Development Requirements, Test and Evaluation. The Director of Research and Development Requirements, Test and Evaluation (DR&DR,T&E) carries out the CNO's responsibility for determining military R&D requirements and for implementing Operational Test and Evaluation. The Director, R&DR,T&E also reports to the ASN(R,E&S) in his capacity as Director, Research, Development, Test and Evaluation (see 1.4.3) which provides staff and technical support concerning R&D and acquisition management to the ASN(R,E&S) and to the USN (see E3.12).

1.4.7 Commandant of the Marine Corps. The Commandant of the Marine Corps (CMC) is responsible for providing, equipping and training Marine Corps forces (see E6). The general duties of the CMC which relate to research and development and to acquisition management include the following:

- Plan and determine the requirements of the Marine Corps for equipment, weapons, munitions, materials, supplies, facilities and maintenance and support services. This responsibility includes determining the characteristics of equipment and material to be purchased or developed, and the training required in the use and maintenance of such systems necessary to prepare Marine Corps personnel for combat.
- Develop, in coordination with other services, the doctrines, strategies, tactics and equipment employed by expeditionary forces in vertical envelopment and amphibious operations.
- Provide for developing, testing and evaluating weapon systems and equipment to ensure that such meet immediate and long range needs within the limits of available resources. To provide direct staff assistance and advice to the Assistant Secretary of the Navy (Research, Engineering and Systems) in the direction, review and appraisal of USMC-related R&D programs and in the overall technology acquisition activity.

1.4.7.1 Commanding General, Marine Corps Research, Development and Acquisition Command. The Commanding General, Marine Corps Research, Development and Acquisition Command (CG,MCRDAC) is responsible for planning, supervising, conducting and monitoring all Marine Corps-related research and development, and acquisition management functions. His responsibilities extend beyond the procurement decision and include fielding all equipment as well as the determination of maintenance plans. He also, as head of a directorate within the Office of the Assistant Secretary of the Navy (R,E&S) is responsible to the Secretariat for all programs relating to Marine Corps research and development activities. As the Marine Corps Program Executive Officer (PEO),

he reports directly to the Under Secretary of the Navy on acquisition matters.

1.4.8 Organization for Acquisition. In his National Security Decision Directive which put into effect certain recommendations of the President's Blue Ribbon Commission on Defense Management, President Reagan specified that, in organizations for acquisition, "no Program Manager would have more than one level of supervision between himself and his Service Acquisition Executive."

Thus, in the Department of the Navy, the Program Manager (PM) reports to a Program Executive Officer (PEO) who reports to the Navy Acquisition Executive (NAE). For programs under the cognizance of the Defense Acquisition Executive (DAE), the Navy Acquisition Executive reports directly to the DAE who is the Under Secretary of Defense (Acquisition).

Ref.: DOD Directives 4245.1 and 5000.1; SECNAV Instructions 4210.8 and 5000.1

1.4.8.1 Navy Acquisition Executive. The SECNAV designated the Under Secretary of the Navy (USN) as the Navy Acquisition Executive (NAE) for the Department of the Navy. The NAE is responsible for all major program issues and all other aspects of Navy acquisition activities of interest to the Under Secretary of Defense (Acquisition) in his role as the Defense Acquisition Executive (see 1.2.3). The Navy Acquisition Executive is a permanent member of the Defense Acquisition Board (DAB).

The USN is assisted in his function as Navy Acquisition Executive by the ASN(R,E&S) and the ASN(S&L). The ASN(R,E&S) assists on major programs to their transition to Full-Scale Production. The ASN(S&L) provides the NAE assistance beyond that point. The two Assistant Secretaries support the NAE jointly on the Full-Scale Production decision.

1.4.3.2 Program Executive Officer. The Commanders of the Naval Air Systems Command (NAVAIR), Naval Sea Systems Command (NAVSEA), the Space Warfare Systems Command (SPAWAR) and the Strategic Systems Program Office (SSPO), and the Commanding General, Marine Corps Research, Development and Acquisition Command (CG,MCRDAC) have been designated the Program Executive Officer (PEO) for their respective organizations.

The PEO has authority and responsibility for all Acquisition Category I (see 2.5.2.1) programs as well as other programs designated specifically by the SECNAV. The PEO reports directly to the NAE concerning program status.

1.4.8.3 Program Manager. The Program Manager (PM) is directly responsible to his PEO, and reports only to him on program matters. Thus, no manager will have more than one level of supervision between him and the Navy Acquisition Executive, and no more than two organization echelons between him and the Defense Acquisition Executive.

1.4.8.4 Acquisition oversight and performance reporting. The ASN(R,E&S) and the ASN(S&L) monitor and evaluate performance of Program Managers. These responsibilities apply to PMs in charge of ACAT level III programs and above, and certain other designated programs as well as Commanders of Naval Laboratories and of Test and Evaluation Centers. Such oversight responsibilities include:

- Advising the SECNAV of program progress and status.
- Submitting concurrent fitness reports on Program Managers in cases of outstanding or unsatisfactory performance.

Ref.: SECNAV Instruction 5000.32

1.5 PROCESS INTEGRATION

Research & development and acquisition management is a multi-stage information generation and conversion process with integration of the data among the various stages. The productivity of the overall process depends as much on efficient information coordination among the stages in the process as on good research or development work within the stages. Various institutional procedures and organizations have evolved which facilitate the integration process.

1.5.1 RDT&E Interrelationships. An effective research, development, test and evaluation activity requires considerable coordination. While various RDT&E organizations and individual executives carry out their assignments in a relatively autonomous manner, planning, execution, management and control of the overall research and development effort must be closely coordinated and focused to be effective.

The process through which this coordination is accomplished is the interrelationship among the various parts of the system. Few areas of activity require greater discipline than the process of research and development. While innovative thinking and experimentation are R&D cornerstones, and must be nurtured and encouraged, such activities must be focused on relatively specific areas of Navy application. Objectives, and an efficient flow of information assure that efforts continue to be applications-oriented.

1.5.2 Advising Boards, Panels and Committees. Face-to-face groups of individuals, having disparate responsibilities but related functions and objectives are primary forums for providing essential information flow and coordination. These groups within the Navy's research and development and acquisition process range from boards and panels which provide information, analyses and experienced advice and guidance to committees of increasingly senior executives and officials which formulate policy and effect decisions; all are related to an orderly flow of information (see E9).

1.5.3 Scientific and Technical Information. One of the basic "products" of the research and development and acquisition process is Scientific and Technical Information (STI). This product results from the Navy's ability to (1) provide R&D and acquisition managers and appropriate personnel necessary STI, (2) collect and store such information and (3) make STI available when required. Several organizations within Navy have been established expressly to collect, analyze, store, maintain and disseminate scientific and technical data. The functions and activities of these organizations—and their "products"—are integrated to aid in improving overall RDA effectiveness in the Scientific and Technical Information Program (STIP) (see Appendix D for further information on STIP and STI).

Ref.: DOD Directive 3200.12; SECNAV Instruction 3900.43

1.6 PROGRAM MANAGEMENT

Program Management consists of planning, organizing, coordinating, directing and controlling the combined efforts of participating civilian and military Navy personnel and contracting agencies in successfully accomplishing a program. Program Management, without reservation, is one of the most important and critically necessary functions of Navy research and development and acquisition.

Ref.: DOD Directive 5000.1; SECNAV Instruction 5000.1

1.6.1 Why Program Management? The central characteristic of Program Management is the Program or Project. The work is dedicated to a

specific, well identified beginning and end. It is solely "product-driven." Consequently, the Program Manager (PM) is highly oriented toward the end-product of the Program—hardware or software. He or she also must be highly motivated to the successful completion of this product. In comparison, our laboratories, many of the participating universities and industries and the other organizational components which comprise Navy's RDT&E and acquisition system have less specifically defined product goals, but rather are engaged in continuous, "building block" efforts to improve the process and to achieve longer term, more general scientific and technical goals; goals often times much less specific and clear-cut than those of the Project Manager, and frequently less certain, especially in the research part of the spectrum. These organizations are structured, consequently, around skills, disciplines or function; frequently in a cooperative, matrix environment.

Both types of organizations are essential to achieving effective and economical research and development and acquisition results. They complement each other in significantly affecting the quality of the state-of-readiness of our Navy and Marine Corps fighting forces.

1.6.2 Establishing the Program. Managers of designated programs operate under charters issued by the respective Program Executive Officers (see 1.4.8.2). These charters, issued as 5400 series instructions, set forth the authority, responsibility and operating relationships of the Program Manager.

1.6.3 Staffing the Program Office. An approved program is staffed with the caliber and number of people required to get the job done. These people possess both management and technical skills and experience required to support the Program Manager (PM) in carrying out his responsibilities successfully.

Effective performance by the Program Manager requires both the authority of military rank and the confidence of technical and business knowledge and experience. As a general rule, the Navy Program Manager will be a Marine Colonel or a Navy Captain, with the most important and critical programs headed by a flag officer. Sometimes a Senior Executive Service (SES) civilian manager will be the PM. The Deputy Program Manager for major projects typically will be an SES civilian.

Personnel considered for assignment as senior members of a Project Manager's staff should be individuals expected to be available for at least three years, with major Program Managers serving four-year tours.

Training and development of PMs and senior staff members is a vital and ongoing function (see 1.6.4 on the Material Professional program). The manager of a major program is required by law (Section 1622 (b)(1) of Title 10, United States Code) to complete successfully the Program Management Course (PMC) at the Defense Systems Management College, or a comparable program management course, prior to assignment as a program manager. In addition, the senior program office staff members should be graduates of the PMC course or have equivalent education or experience. Effective July 1, 1990, Section 1623(b) of Title 10, requires that general and flag officers assigned procurement commands meet the education and experience requirements prescribed for program managers in Section 1622(b).

SES personnel assigned to program offices normally will have had broad experience and training. Key staff subordinates are selected by the Program Manager and must be highly qualified by training or experience to manage one or more important elements of the program.

Ref.: DOD Directive 5000.52; SECNAV Instructions 12920.1, 12950.11; OPNAV Instruction 1211.8

1.6.4 Materiel Professional Program. The Materiel Professional (MP) Program was

established to sustain superiority in naval system management by improving career development, assignment and use of personnel involved in systems acquisition, logistics, technology, support, facilities, materiel maintenance, and materiel readiness. There are parallel Navy programs for military and civilian MPs.

The MP career path provides for formal education, developmental training and assignment to appropriate positions of increasing responsibility.

Over 100 high-level positions have been specifically designated as MP billets. Examples of billets designated for military MPs include SYSCOM Commanders, Director R&DR,T&E, Director RDT&E, DCNO Logistics, Laboratory COs and Program Managers.

Ref.: DOD Directive 5000.52; SECNAV Instruction 1040.1, 12400.7; OPNAV Instruction 1040.9

1.7 PARTICIPANTS IN THE ACQUISITION PROCESS

The acquisition of a major system requires a well coordinated effort. Responsibilities of some of the principals are as follow:

Ref.: DON Programming Manual, Appendix NB

1.7.1 Appropriation Sponsor. The Appropriation Sponsor is a Deputy Chief of Naval Operations (DCNO), Assistant Chief of Naval Operations (ACNO) and Commanding General, Marine Corps Research and Development Command (CG,MCRDAC) charged with supervisory control over an appropriation. The Director R&DR,T&E is the Appropriation Sponsor for the RDT&E,N appropriation relating to research and development.

1.7.2 Program Sponsor. The Program Sponsor is the DCNO or Director, Staff Office (DSO) responsible for determining program objectives, timephasing and support requirements, and for appraising progress, readiness, and military worth for a given weapon system function or task. He or she is the CNO's or CMC's agent concerning the program. The Marine Corps program sponsor is the same executive as the appropriation sponsor.

1.7.3 Resource Sponsor. A Resource Sponsor is the DCNO or DSO responsible for a group of programs and resources constituting certain warfare and supporting warfare tasks. In liaison with Program and Appropriation Sponsors, he prepares and justifies a Navy position on resource allocation within the assigned group of tasks to assure a fiscally effective and balanced program.

1.7.4 Program Manager (PM). A Program Manager is responsible for executing an approved program. The term is restricted to the manager of a relatively major effort who has been designated PM in a program charter (see 1.6.2). He is responsible to the Program Executive Officer (PEO) (see 1.4.8.2).

1.7.5 Program Coordinator (PC). The Program Coordinator is the OPNAV official responsible to the Program Sponsor for providing direction and funds for the execution of acquisition programs. The Program Coordinator is the working link between the Program Sponsor and the Program Manager.

1.7.6 Development Coordinator. Development Coordinators (DC) are officials on the staff of the Director, R&DR,T&E/RDT&E (see 1.4.3 and 1.4.6.1) assigned overview of development programs.

Ref.: SECNAV Instruction 5000.1

1.7.7 Ship Acquisition Program Manager. A Ship Acquisition Program Manager (SHAPM) is a NAVSEA Program Manager responsible for the development, design, construction and conversion of assigned ship types. SHAPM operates under a charter from Commander, Naval Sea Systems Command.

1.7.8 Acquisition Manager. An Acquisition Manager performs the functions of a Program Manager for acquisitions which do not require the degree of visibility and status of program management.

1.7.9 Contracting Officer. The Contracting Officer has legal responsibility for all contractual matters related to an acquisition.

1.8 NAVAL SYSTEMS COMMANDS

Most of the DON RDT&E programs are managed by the Systems Commands (SYSCOMS). These are the:

- Naval Air Systems Command
- Naval Sea Systems Command
- Space and Naval Warfare Systems Command
- Naval Supply Systems Command
- Naval Facilities Engineering Command.

Systems Commanders report directly to the Vice Chief of Naval Operations (VCNO). See E4 for information on the various SYSCOM organizations.

1.9 RDT&E FIELD ACTIVITIES

Navy laboratories, centers and related field activities are vital sources of strength for the Department of the Navy RDT&E effort.

The Navy develops and long has maintained laboratories of acknowledged excellence in pertinent areas of science and technology. The laboratories develop and prosecute scientific and technical programs which have as their prime objective the improvement of naval capabilities, equipment and systems.

For additional information on the Navy's laboratories and other field activities, see Appendixes G and H.

Ref.: SECNAV Instruction 3910.3; *NAVAIR Instruction 5451.87*

SELECTED REFERENCES ON RDT&E ORGANIZATION MATTERS

DOD Directive 5100.1 (SECNAV 5410.85), "Functions of the Department of Defense and its Major Components," provides a basic statement of the responsibilities of various organizations and officials within the Department of Defense.

SECNAV Instruction 5430.7, "Assignments of responsibilities to and among the Civilian Executive Assistants to the Secretary of the Navy," documents the responsibilities of ASN(R,E&S) as well as the other Civilian Executive Assistants to SECNAV.

SECNAV Instruction 5430.57, "Assignment of responsibilities for research, development, test and evaluation," defines the RDT&E responsibilities of senior Department of Navy officials including CNO, CMC, and CNR.

SECNAV Instruction 5430.95, "Assignment of responsibilities to the Assistant Secretary of the Navy (Research, Engineering and Systems)," defines arrangements for management of DON functions within the office of ASN(R,E&S).

Chapter 2
PLANNING

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Chapter 2
PLANNING

Research and development essentially is progress through innovation. In the Navy, its principal objective is to assist our Naval Forces to achieve advantage and success over our Nation's present and potential adversaries. Research and development, by its very nature, is uncertain in its success probability. Thus, to attempt to assure reasonable success within reasonable time and at reasonable cost, requires planning; possibly a higher degree of planning and evaluation of options than in any other single field of management.

It should be emphasized that research and development is only part of the innovative process which must be managed to provide optimum progress to our naval operating capabilities. Its part is to provide the means for advancing these capabilities to meet the Navy's overall, future strategy. The resulting strategy is developed in the long-range planning process and in the plans discussed in this and the subsequent Chapters. In this Chapter the development of required plans is traced from their genesis in the interaction of scientific and technological possibilities, to their definitive expression in plans for systems under development. This analysis is in terms of two major functions: development of the Technology Base and the development of hardware-based operational capabilities.

Unless one understands the essential function of planning, one might easily conclude that the time spent in documentation is disproportionate to their worth. However, the true function of documents—the payoff which justifies the considerable investment in their preparation—is in the process of their development and their ultimate use.

Preparation of documents should catalyze decisions on crucial issues, ensure that problems are thought through, and record the results of an interactive decision process involving numerous inputs.

2.1 NAVY AND MARINE CORPS PLANNING SYSTEM

The Navy and Marine Corps Planning System provides for developing Navy and Marine Corps plans and related programs for inclusion in the joint plans. These naval forces plans are the basic foundation for further Department of the Navy planning and programming. This system responds and operates within the DON Consolidated Policy and Planning Guidance and the Joint Strategic Planning System (see 3.3.2 and 3.3.3). An important factor in developing Navy and Marine Corps plans are the time provisions required for research, development test and evaluation of systems, weapons and related assets, their production and construction and that needed to train personnel.

Ref: DON Programming Manual

- Develops Navy concepts, requirements, and objectives, and provides for their convincing presentation to higher authority. The intention is to introduce the Navy's viewpoint into Joint Staff, Department of Defense, and Department of the Navy program planning which

annually becomes a part of the Department of the Navy's budget submission to the Secretary of Defense.

- Second, it provides a framework for the translation of guidance received from higher authority, strategic and operational concepts, and technological and intelligence forecasts into research and development, force level, personnel, and support plans and objectives.
- Third, it provides guidance and direction for the application of current operating capabilities.

2.1.1 Navy and Marine Corps Planning System Intrarelationships. Various Navy and Marine Corps plans and documents interact to constitute an integrated "system." The output of some plans constitutes a major part of the inputs to others.

The Navy and Marine Corps Planning System also responds to the Joint Strategic Planning System (JSPS) of the Joint Chiefs of Staff, the Department of Defense Planning, Programming, and Budget System, and the Congressional budget cycle. There is a two-way relationship between the Navy and Marine Corps Planning System and the JSPS in that the Navy and Marine Corps Planning System provides inputs into the Joint Planning System, and Navy plans implement Joint plans.

2.1.2 Planning System Documents. Documents of the Navy and Marine Corps Planning Systems and the JSPS are described in Chapter II of the DON Programming Manual. Related documents used in the PPBS process are described in Section 3.4 of the next chapter.

2.2 OVERVIEW OF THE RDA PROCESS

In this section, the RDA process is examined, both as it relates to the larger process of planning and managing improvement in the Navy's ability to carry out its mission, and in terms of its internal workings.

2.2.1 Output of the RDA Process. It is not uncommon for people to equate RDA with the development of hardware, a view which is as limited as it is erroneous. The product of the RDA effort is an operational capability. Weapons hardware is but one subsystem of operational capability. This point must be re-emphasized: The objective of RDA is operational capability, not hardware *per se*.

The elements of the total system required to provide an operational capability include:

- Equipment—system hardware plus equipment (trainers, support equipment, etc.) required for its effective utilization and support.
- People—trained crews and maintenance personnel plus the support system required for their continuing development and the training of their replacements.
- Facilities.
- Material—consumables, spares, etc.
- Information—technical maintenance data, operating tactics, maintenance procedures, etc.

2.2.2 Nature of the R&D Process. The function of R&D in the development of operational capabilities is the production of the information required to achieve such capabilities. Some needed capabilities can be achieved without new information, and hence are not R&D problems. RDA is a multistage information generation and conversion process characterized by the integration and conversion of information within stages and information flow coupling between stages.

R&D is a way of progressively reducing uncertainty by buying information. In the earliest stages of the R&D process, uncertainty usually is very high regarding probable results and the value of the results. Decisions on what and on what not to do are made on the basis of expected value—the predicted value of the payoff if successful, multiplied by the probability of success. Judicious decisions must be made on how much to pay for

uncertainty-reducing information before making particular R&D investment decisions. In the case of major weapon systems, a very substantial investment usually is justified.

Fortunately, costs and uncertainty are inversely related in the RDA process. In the research phase, uncertainty usually is high, but the cost relatively low. In the systems development phase of the process, cost per project can be extremely high while uncertainty is relatively low.

The RDA manager, like all managers, is accountable for putting the resources subject to his discretion to their most productive use. The obligation will cause the RDA manager to "bet on longshots" where costs are low relative to payoff. He will invest significantly to reduce uncertainties where large investments are at stake.

2.2.3 Threat Information. Threat is the capability of a potential enemy to limit or negate a Navy mission or capability. The interface of threat with each weapon system is continuous throughout the life of the system. In each system's program it is required that specific plans be included for obtaining and using threat intelligence for the life cycle of the program.

Threat statements are required in program requirements documentation (TOR, ROC, OR, MNS, SCP, DCP, TEMP) and to be updated at each decision Milestone (see 2.5.4). If a development is not threat-related, that point must be explained by the program sponsor in the appropriate requirements document.

Ref.: OPNAV Instruction 3811.1

2.2.4 Studies, Analyses and Systems Engineering. Optimizing the use of resources requires a clear understanding of (1) what is needed, (2) means of achieving desired results and (3) the advantages and disadvantages of the alternatives. Studies, analyses and systems engineering are means for producing such information.

2.2.4.1 Studies and analyses. Studies and analyses lead to critical examination and investigation of a subject, resulting in conclusions or recommendations that make substantive contributions to planning, programming and decision making.

Studies and analyses typically are "paper-and-pencil" efforts to organize and evaluate available data to provide greater understanding of alternative organizations, tactics, doctrines, policies, strategies, procedures, systems, or programs. It is DOD policy that studies and analyses be used as essential management tools. They are an integral part of executive or command responsibility.

Studies and analyses may be conducted by in-house organizations, by affiliated organizations or by outside organizations under contract or grant.

Ref.: DOD Directive 4205.2; SECNAV Instruction 4200.31; OPNAV Instruction 5000.37

2.2.4.2 Engineering management. Engineering management is the effort needed to transform a military requirement into an operational system. It includes system engineering to define system performance criteria and configuration, the planning and control of program tasks, integrations of engineering specialties, and the management of a totally integrated effort, including design engineering, special engineering, test engineering, logistics engineering and production engineering to meet cost, technical performance, supportability and schedule objectives.

2.2.4.3 System engineering process. The system engineering process is a logical sequence of activities and decisions followed to transform an operational need into system performance parameters and a preferred system configuration.

Ref.: MIL-STD-499A, "Engineering Management"

2.2.5 RDA as a Subsystem. It is the function of RDA to help provide capabilities needed to carry out most effectively the Navy's mission. The determination of future operational capabilities is not part of the RDA process, but rather of the overall Navy planning process as described earlier. While it is the function of higher level planning to decide what capabilities are desired, it is the function of RDA to determine what will be *possible* to achieve, how they can be achieved, and to develop and organize the new knowledge required to accomplish the task. It is the function of acquisition activities to produce those capabilities. Thus RDA constitutes an important subsystem of the overall operational capability development system.

2.2.6 "Invention" and "Innovation." Achieving new capabilities, which is a principal justification of R&D effort, requires both invention and innovation. Invention is the development of new options; innovation with developing and putting into use the capabilities such options make possible. Generally, innovation is many times more costly than the inventive action.

In general, effort categorized as Research (6.1) or Exploratory Development (6.2) is part of the inventive process, while Advanced Development (6.3), Engineering Development (6.4) and Operational Systems Development (6.6) are primarily innovative. The whole process of developing Integrated Logistic Support (see 2.6.1), which is important to attaining operational capability, is part of the innovative process.

2.2.7 Categories of RDT&E. For planning, funding and review purposes, the Defense RDT&E Program is structured in six categories. These categories often are referred to by the numbers of the categories under the DOD Programming System. The six categories are as follows:

Ref.: DON Budget Guidance Manual (NAVCOMPT 7102.2)

2.2.7.1 6.1 Research. Includes scientific study and experimentation to increase knowledge and understanding in the physical, engineering, environmental and life sciences related to long-term national security needs. Research provides fundamental knowledge required to solve military problems. It forms a base for (a) subsequent exploratory and advanced developments in Defense-related technologies, and (b) new and improved military capabilities in areas such as communications, detection, tracking, surveillance, propulsion, mobility, guidance and control, navigation, energy conversion, materials and structures and personnel protection, safety, and support.

2.2.7.2 6.2 Exploratory Development. Includes efforts to solve specific military problems, short of major development. Exploratory Development may vary from fairly fundamental applied research to sophisticated breadboard hardware, study programming and planning efforts. The dominant characteristic of Exploratory Development is that it is directed toward specific military problems to develop and evaluate the feasibility and practicability of proposed solutions. Program control of Exploratory Development elements normally will be at the mission or warfare management level.

2.2.7.3 6.3 Advanced Development. Includes efforts on projects which have moved into the development of hardware for test. The prime objective is proof of design concept rather than the development of hardware for service use. Projects in this category have potential military applications.

2.2.7.4 6.4 Engineering Development. Includes programs in full scale development, but which have not received approval for production or had production funds included in the DOD budget submission for the budget or subsequent fiscal year. Engineering Development is characterized by major line item projects, and program control by individual projects.

2.2.7.5 6.5 Management and Support. Includes support of installations or operations required for general research and development use. Included would be test ranges, military construction, maintenance support of laboratories, operations and maintenance of test aircraft and ships, and studies and analyses in support of the R&D program. Costs of laboratory personnel, either in-house or contract-operated, would be assigned to appropriate projects or as a line item in the Research, Exploratory Development, or Advanced Development Program areas. Military construction costs directly related to a major development program will be included in the appropriate element of that program.

2.2.7.6 6.6 Operational Systems Development. Includes those projects still in Full-Scale Development, but which have received approval for production through DAB or other action, or for which production funds have been included in the DOD budget submission for the budget or subsequent fiscal year. All work in this area is identified by major line item projects that appear as "RDT&E Costs of Weapon System Elements" in other programs. Although Operational Systems Development is an official budget category, 6.6 is a term used for convenience in reference and discussion. Thus, no program *element* will exist within category 6.6. Program control will be exercised through review of individual research and development efforts in each Weapon System Element.

2.2.8 Functional View of the RDA Process. Exhibit 2-1 is a functional view of the Defense RDA process in terms of four functions. The term "function" denotes a process or operation through which one or more inputs are converted into a single output. For example, a cement mixer transforms water, sand, dry cement and gravel into a single product—wet concrete.

The functional phases represented by the first two blocks are considered generally with the development of the "Technology Base." The Technology Base is the 10 percent of DOD's RDT&E Program devoted to basic and applied research and technology from which most of our options for new systems and better manpower derive. When Advanced Technology Development (6.3A) programs are included, the area is known as Science and Technology.

The 6.1 block depicts the development of the store of knowledge into how nature works; a knowledge essential to the development of a new technology. Predictions concerning technological capabilities that might prove most valuable, accompanied by information on the problems of attaining them, are essential to decisions on what research is needed to accomplish them.

The 6.2 block represents the development of technologies upon which the development of advanced systems will rest. This functional phase centers on Exploratory Development.

The 6.3 block represents early examination of the feasibility of alternative concepts through Advanced Technology Demonstration (6.3A) and the demonstration and validation phase of Advanced Development (or 6.3B) as the initial use of new technologies. It involves experimentally demonstrating the feasibility and cost of combining technologies into building blocks. *This is the beginning of the innovative process.* At this point the basic technology must be in hand. The major products of 6.3 are (a) proof of the advantage to be gained through the application of new technology and (b) a clearer recognition of additional new technology that will be required for an advanced system.

The fourth block concerns Engineering Development and Operational Systems Development (6.4/6.6). The new technology must have

been developed through Research and Exploratory Development efforts before it can be exploited in systems development.

In paragraph 2.2.2, RDA was characterized as a multistage information generation and conversion process with information flow coupling the stages. From the standpoint of the effectiveness of the process, effective coupling among the stages is as vital as good research and engineering within a stage.

2.2.9 The User-Supplier Dialogue. Efficient coupling requires that the Supplier, as spokesman for means, and that the User, as spokesman for ends, coordinate their work. The User primarily is responsible for determining what needs to be done while the Supplier is primarily responsible for determining how results can be achieved. Together, through an active dialogue they hammer out the best compromise between what is desirable and what is possible.

The roles of User and Supplier are relative. An individual or organization may be a User in one relationship and a Supplier in another. For example, the SYSCOM Commanders function as Users in their relationship with the Chief of Naval Research, but as Suppliers when dealing with the CNO. The CNO in turn is the User in his dealings with the SYSCOM Commanders, but the Supplier when dealing with the Secretary of Defense.

2.2.9.1 "Needs" and "requirements." A variety of terms is used concerning desired capabilities—e.g., "need," "objective," "target," "problem," "requirement," etc. While all of these terms denote capabilities of value in accomplishing a mission, they differ in what they imply about the User's commitment to spend resources for their attainment. The whole User-Supplier dialogue is tempered by the obligation of both User and Supplier to apply government resources to yield the optimum overall benefit in mission capability.

"Need" is used by DOD in a specific sense, as set forth by OMB in Circular A-109. Under the Circular, when analyses indicate a deficiency in existing capabilities or an opportunity to establish new capabilities, a "mission need" exists. In DOD, for major programs, this takes the form of a Mission-Need Statement (MNS) submitted by a Service Chief with the Service POM. Approval of the program or additional direction is provided by the PDM.

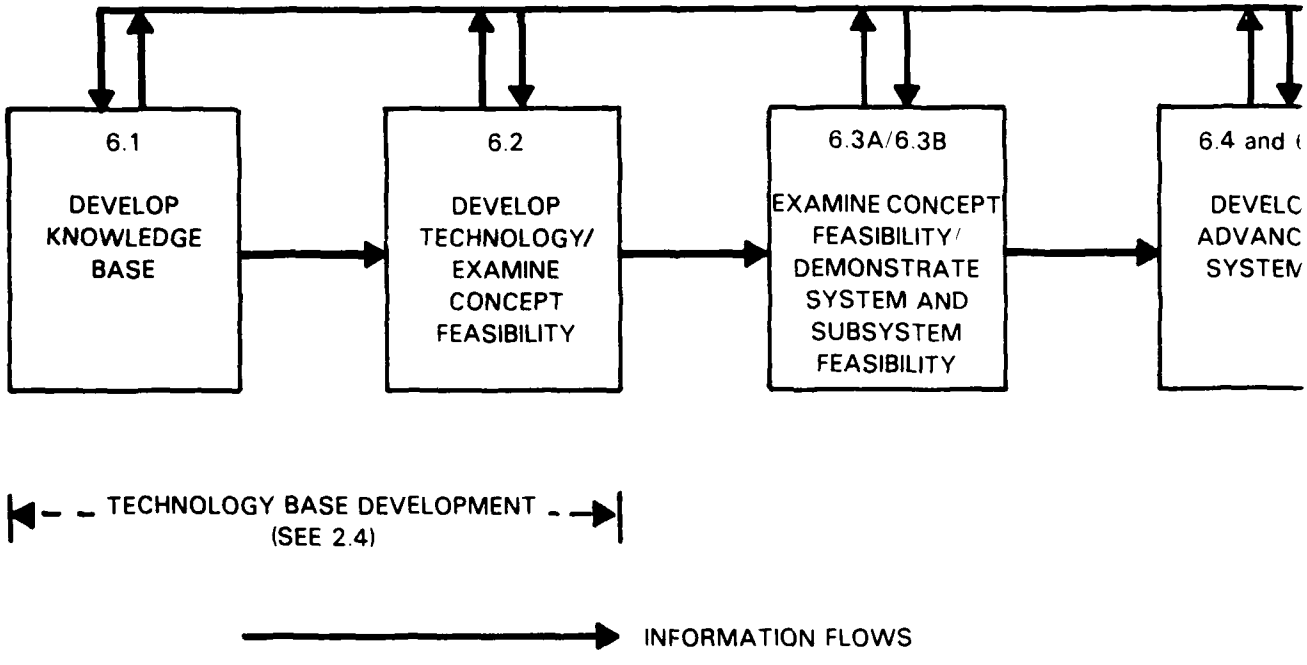
A "requirement" generally is outlined in a document by which the User, CNO/CMC, describes to the Supplier—normally the technical establishment—a specific mission need for resolution.

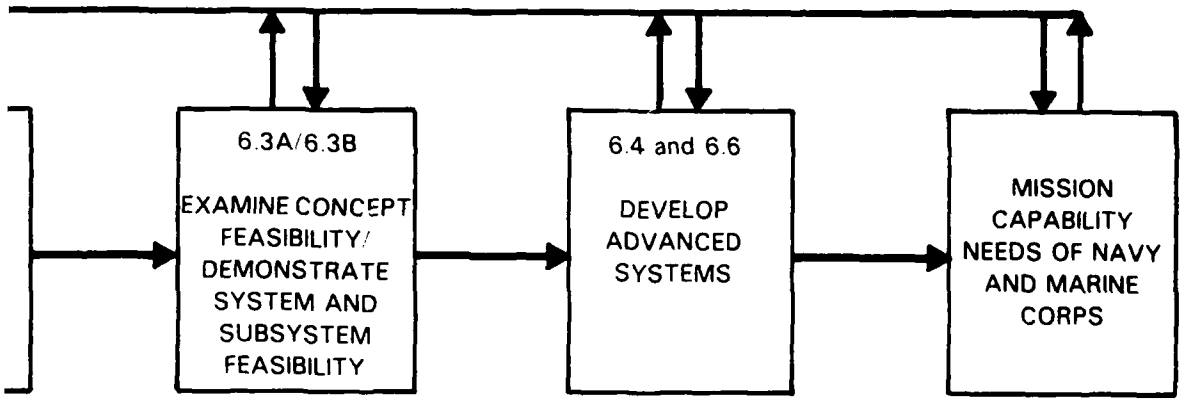
In the formal User-Supplier dialogue between CNO/CMC and the SYSCOMs, the User issues an Operational Requirement (OR) (see 2.5.3.3) for the Navy and a Required Operational Capability (ROC) (see 2.5.9) for the Marine Corps. This indicates an interest in a specific capability. An approved OR/ROC, for a less-than-major program, permits inclusion of the program in the POM. (See discussion of "incremental acquisition strategy" in 2.7.4.).

2.2.9.2 "Technology push" and "requirements pull." The concepts of "technology push" and "requirements pull" relate to the influence of "supply" (technology push) and "demand" (requirements pull) on shaping research and development programs. Technology push is a matter of what is technologically feasible and of the eagerness of the R&D community to do what can be done; while requirements pull concerns what needs doing to solve problems barring attainment of needed operational capabilities.

2.2.9.3 Technology utilization. The process of coupling involves learning about potential applications for capabilities emerging from research and development, or conversely, learning of technological means for providing required capabilities. This process is completed when the right User and Supplier have established contact.

Once the initial contact has been established, the transfer of knowledge from Supplier to User


6.1
DEVELOP KNOWLEDGE BASE
6.2
DEVELOP TECHNOLOGY/ EXAMINE CONCEPT FEASIBILITY
6.3A/6.3B
EXAMINE CONCEPT FEASIBILITY/ DEMONSTRATE SYSTEM AND SUBSYSTEM FEASIBILITY
6.4 and
DEVELC ADVANC SYSTEM
TECHNOLOGY BASE DEVELOPMENT
(SEE 2.4)
INFORMATION FLOWS



INFORMATION FLOWS

Exhibit 2-1
Functional View of the
Defense RDA Process

must be accomplished. Effective transfer of proven technology requires much more than forwarding of documents. One aspect of this problem is the transfer of knowledge from R&D to production.

2.2.9.4 Patents as an aid to coupling. The United States Patent Office has copies of more than three million domestic patents, seven million foreign patents, and countless pieces of trade literature classified by technical categories. A review of this information should provide familiarization with any prior approaches to resolve a particular problem, or to identify approaches which may be covered by patents. The knowledge can result in cost savings by avoiding the unnecessary expense of duplicating prior efforts and possible patent infringements.

2.2.9.5 Domestic Technology Transfer Program. Technology developed under military programs has made great contributions to the ability of U.S. high-technology products to compete in world markets. The Navy Military-Civilian Technology Transfer and Cooperative Development Program was established to strengthen this relationship between Navy R&D and the civilian economy.

Philosophical and programmatic changes have resulted from the Stevenson-Wydler Technology Innovation Act of 1980 (PL 96-480), the Federal Technology Transfer Act of 1986 (PL 99-502) and Executive Order 12591 of April 1987. Essentially, Navy domestic technology transfer has moved from an all-volunteer, "first-come, first-served" effort to a more structured endeavor. The changes also enhance financial return to both individual inventors and R&D activities from royalties received from benefiting organizations.

The objectives of this program are to (1) facilitate the flow of Navy-developed technology into civilian applications and (2) provide for cooperative development of technologies of importance to both the Department of the Navy and the civilian economy.

2.2.10 Weapons Life Cycle. The life cycle of a system is divided into four RDA phases plus the operational support phase. In some cases, these phases are preceded by an Advanced Technology Development Phase. These phases are as follows:

Ref.: DOD Directive 5000.1; DOD Instruction 5000.2

2.2.10.1 Advanced Technology Development. Some programs pass through a non-acquisition, development phase, designed to facilitate the transition of technology from the research and exploratory stages into systems development. Projects selected for this phase frequently are risk-reducing Advanced Technology Demonstrations (ATDs) of technological innovations in a realworld environment. This phase corresponds to the earliest stages of Advanced Development, often referred to informally as 6.3A. The 6.3A phase provides candidate concepts for further development.

2.2.10.2 Concept Exploration/Definition Phase. This is the first phase at which a concept becomes identified with a system *per se*. It begins with the mission need determination decision, by approval of a MNS, for major (ACAT ID (DAB)) programs, or of a TOR/OR/ROC for ACAT IC and less-than-major programs.

During this phase, the technical, military and economic bases for an acquisition program are established through comprehensive systems studies, and experimental hardware development and evaluation. The Concept Exploration/Definition Phase is highly repetitive. Its stages overlap rather than occur sequentially. However, flowing from interacting inputs of operational needs and technology, the following stages generally occur:

- Identification and definition of conceptual systems.
- Analysis (threat, mission, feasibility, risk, cost, tradeoffs, etc.)

- Experimentation and test (of operational requirements, key components, critical subsystems and marginal technology).

The products of the Concept/Definition Exploration Phase are alternative systems and their associated program characteristics (costs, schedules and operational parameters).

2.2.10.3 Concept Demonstration/Validation Phase. This is the phase in which, through extensive analysis and hardware development, the principal program characteristics are validated. It often is identified with Advanced Development, and referred to informally as 6.3B. It relies on hardware development and evaluation rather than paper studies, since this provides a better definition of program characteristics, higher confidence of risks, and greater confidence in the ultimate outcome. In an idealized case, this phase concludes with a successful "brass board" model demonstration.

2.2.10.4 Full-Scale Development Phase. During this phase, the weapon system (including all the items necessary for its support, i.e., training equipment, maintenance equipment, operation and maintenance manuals, etc.) is designed, fabricated and tested. The intended output is a hardware system, the performance and reliability of which have been proven experimentally, along with the documentation needed to produce for inventory. An essential activity of the Full-Scale Development Phase is Test and Evaluation (see Chapter 7, and Appendix H); conducted both by contractors and by the Navy.

2.2.10.5 Full-Rate Production/Deployment Phase. During this phase the weapon system, including training equipment, spares, etc., is produced for operational use and some operational test and evaluation is conducted. The weapon system is provided to and used by operational units.

2.2.10.6 Operations Support Phase. During this phase, which begins concurrently with initial deployment, the weapon system is logistically supported throughout its life cycle and may undergo major modernization.

2.3 PLANNING FOR RESEARCH

The origin of new technologies and the improvement of existing technology depend on the knowledge base developed through scientific research. Research tasks evolve in a variety of ways, including the following:

Ref.: DOD Directive 3210.1 (ONR 3900.30); ONR Instruction 3910.2

2.3.1 Research of Opportunity. The need for research in a particular area may be discovered by activity within science itself. A new discovery in a field of little previous interest may reveal new possibilities of far-reaching importance to the Navy. Resources have to be made available for such opportunities.

2.3.2 Research of Response. The need for research may be indicated by events in another part of the Navy program. In conducting a development project, specific problems arise whose solutions require new knowledge obtainable only through scientific research.

2.3.3 Naval Research Requirements. The Naval Research Requirements (NRRs) constitute the structure for planning research in science so that an adequate scientific knowledge base will be maintained. Although a time lag of several decades may exist between the articulation of research results and their application to new technology, an adequate base of new knowledge is vital to development of the necessary Technology Base.

An NRR summarizes the need for investigations and studies to provide information related to solving specific practical problems and to expanding the scientific base essential to enhancing existing and future naval technology.

The NRR basically is a Supplier-oriented document. It authorizes research in the identified

areas, but does not state in performance terms the results to be achieved by such research. A principal function of the NRRs is to provide a framework for programming basic research effort (see C3.2).

Ref.: ONR Instruction 3910.2

2.4 PLANNING FOR DEVELOPMENT OF TECHNOLOGY

The objective of technical-base planning is to integrate many individual technology developments in joint service programs to develop the technology to provide the Fleet with new warfighting capabilities; and to make systems more affordable. This requires that technical-base program planning produce a program balanced across a spectrum of individual technology developments and investigations. Planning not only addresses individual programs, but is carried out to achieve balance, meet urgent requirements, prioritize individual programs, and make effective use of available resources. Emphasis in this section is on process and documentation.

Ref.: OCNR Instruction 3910.3

2.4.1 Exploratory Development Program. Exploratory Development is a DOD budget category and is a program that operates under separate rules and chain of command. The process is similar to, but separate from those of Research, Advanced Development and Engineering Development.

Exploratory Development is that segment of the Navy Research, Development, Test and Evaluation (RDT&E,N) Program that includes all efforts, short of major development programs, directed toward the solution of specific military problems. This effort varies from fairly fundamental applied research to development of quite sophisticated breadboard hardware. The Exploratory Development Program provides the vital transition from the products of research to useful application.

The objective of Exploratory Development is to develop new technology needed for future systems and improvement of existing systems in order to allow the Navy to meet the known and projected threats for the next decade or so. Most of the true innovations in naval platforms and hardware systems have either originated or been strongly nurtured in Exploratory Development.

2.4.2 The Planning Process. The Exploratory Development Program PPBS process can be divided into four phases *corresponding to the quarters of the fiscal year*. The process integrates execution, budgeting, programming, and planning. The following sections describe the process in these terms.

2.4.2.1 First quarter: Accountability/ Assessment. The Office of Naval Technology (ONT) assesses the previous and current years' programs by means of formal block-program reviews. This information is used to develop the 6.2 POM, provide block programming guidance for budget execution in the following fiscal year, guide reprogramming and program change request decisions, and guide strategy development. The assessments also identify program accomplishments and potential new starts.

Also during this quarter, the 6.2 submissions for the President's budget are made final, and Research and Development Descriptive Summaries (RDDS) are prepared for Congress. The Maritime Strategy and Warfare Appraisals are reviewed to assess program responsiveness to needs and policy.

2.4.2.2 Second quarter: Strategic Planning. Investment and Mission Area Strategies are developed by ONT. The 6.2 POM is completed and the DON POM requirements are satisfied. This period coincides with Congressional hearings and the middle phases of the DON POM process. Thus, during this period, ONT defends the budget for the

following fiscal year and expenditures planned for the POM years.

2.4.2.3 Third quarter: Execution Planning. The Block Program Guidance is developed and issued, and the block programs for the following fiscal year are developed. The block plans cover the spectrum from the current year, the execution year and POM years. The Mission Area Strategies are reviewed by OPNAV and the SYSCOMs, adjusted to accommodate their recommendations, and put in force. The POM financial figures are submitted to the Director, R&DR,T&E(OP-098).

2.4.2.4 Fourth quarter: Block Program Plan Reviews, Approval and Funding. Block program plans are reviewed, adjusted and approved. Funding documents are announced by 30 September. Approval of the block plans provides a Navy consensus on the next Exploratory Development budget and is the basis for the Navy submittal for the President's budget. OSD reviews the DON Exploratory Development Investment and Mission Area Strategies during this period to obtain information for defense of the DOD budget.

2.4.3 Exploratory Development Planning Documentation

2.4.3.1 Investment Strategy. The Exploratory Development Investment Strategy balances the available resources across mission areas according to priority of needs, payoff, rate of threat development, opportunities and other factors, and defines policies to maximize the effectiveness of the program. The Investment Strategy, reviewed annually during the February/March period, sets the focus and major thrusts of the program. It meets the program guidance of DOD and DON and the needs of the Systems Commands.

2.4.3.2 Mission Area Strategies (MASs). The MASs establish DON Exploratory Development program objectives for each mission area in terms of the operational impact of planned technology programs on the war-fighting capabilities of the Navy and Marine Corps. The MASs, issued each May, provide program goals and guidance for the execution planners and performers, set priorities for technology direction, and define the block program objectives supporting such directions.

2.4.3.3 Block Program Guidance. A Block Program is an integrated group of technology projects with closely related applications and/or technical objectives assigned to a lead Laboratory or to a SYSCOM program manager. Typically, a Block Program encompasses Exploratory Development programs in a warfare technology area. Block Programs are designed to combine funding and program efforts to the maximum extent possible, in order to increase management efficiency.

Each May the Office of Naval Technology provides guidance for Exploratory Development Block Program Plans. This guidance updates format and content requirements, directs thresholds and conditions for reprogramming, provides specific program direction, identifies protected areas of the program, allocates funds to blocks and projects, and provides planning, review, and approval procedures and schedule.

2.4.3.4 Block Program Plans. Block Program Plans are submitted by each claimant in July, presenting their program proposals for the execution year and POM years. In addition to plans, these documents contain sufficient technical information to serve as the consolidated sources for the status, technical content and products of the programs. The technical information is adequate to determine when and where to transition the technologies and to identify gaps in the technology programs. Block Plans, when approved, become the basis for the issuance of funding documents and execution guidance. Block Plans additionally serve as the principal technical and management reference documents for the Exploratory Development Program and as the baseline for measurement

of progress and accomplishment during the execution year. As such, approved Block Plans serve as "contracts" between claimants and ONT.

2.4.3.5 Other documents. In addition to the Investment Strategies, Mission Area Strategies, Block Program Guidance and Block Program Plans described above, several other Exploratory Development planning documents are used. These include the following:

- Claimants submit Task Summaries annually in a format useful in maintaining a computerized data base at ONT. Claimants also submit Block Progress Reports three times a year and Funding Reports monthly.
- ONT publishes an annual 6.2 Accomplishment Report.
- Advanced Technology Demonstration Proposals are received by ONT as candidates for the DON Advanced Technology Demonstration (ATD) Program managed by OP-098.

2.5 SYSTEMS ACQUISITION

The Systems Acquisition activity is among the most important responsibilities of the Department of Navy. It involves the planning and control relating to purchasing all levels of projects, ranging from multi-billion dollar R&D programs to relatively small development jobs. It is mandatory that anyone engaged in the Acquisition activity gain an early and complete understanding of this process.

To assist the reader in this understanding, in addition to the subsequent paragraphs, flow diagrams of the process are shown in Appendix F to this Guide.

Ref.: DOD Directive 5000.1; DOD Instruction 5000.2; SECNAV Instructions 4210.6, 4210.7, 5000.1, 5000.2, 5430.95, 5430.96; OPNAV Instruction 5000.42, 5000.49

2.5.1 Overview of the Process. All systems acquisitions share a common overall objective and basically the same process. However, the degree of formality, extent of documentation, and level of decision authority vary generally with the dollar value of the program.

Acquisition programs are developed in a sequential process. Programs are structured and resources allocated so that achievement of objectives is the pacing function. Further, as the advancing program yields improved information, practical tradeoffs are made among system capability, cost and schedule. Exhibit 2-2 summarizes the process.

Exhibits 2-2 and 2-3 present two perspectives of the acquisition process. The process depicted in these Exhibits, particularly 2-3, provide the framework for the text of section 2.5. The columns of Exhibit 2-3 are discussed in 2.5.2 through 2.5.7.

2.5.1.1 Non-development items (NDI). It is fundamental DON policy that NDI are to be the principal means of satisfying equipment, system and component needs.

> It is Secretary of the Navy policy to institutionalize NDI consideration during the acquisition process to such an extent that its use becomes the rule rather than the exception.

NDI alternatives to conventional R&D must actively be considered at the outset of each new program. In response to Tentative Operational Requirements (TORs) (see 2.5.3.1), each Development Options Paper (DOP) (see 2.5.3.2) must address use of NDI solutions; or partial or

modified NDI solutions where complete NDI is not feasible.

Ref.: SECNAV Instruction 4210.7

2.5.1.2 Acquisition strategy. The acquisition strategy centers on the objectives of the program and the plan for achieving them. The strategy for major programs must be documented and is summarized in program control documents. This overall plan for producing and supporting the system is tailored to the unique circumstances of each program. The strategy emphasizes program structure, particularly timing of T&E periods in relation to milestone decisions.

Ref.: DOD Directive 5000.1, DOD Instruction 5000.2; SECNAV Instruction 5000.2;

2.5.1.3 Program structure. Program structure defines the relationships among development phases, T&E periods, decision milestones and production release. Normally every program/document and presentation includes a program structure diagram (see Exhibit 2-2) illustrating these general relationships.

Key elements of program structure are the decision milestones through which the program advances into the next phase, and T&E phases which generate information on actual progress as inputs into milestone decisions.

Ref.: DOD Instruction 5000.2; SECNAV Instruction 5000.2

2.5.1.4 Test and Evaluation. T&E is the major control mechanism of the acquisition process. Programs advance from one phase to the next, or qualify for major new funding increments, not by calendar or planned schedule, but by achievements of preset-thresholds, verified by T&E. T&E is covered in Chapter 7.

Ref.: DOD Instruction 5000.3; OPNAV Instruction 3960.10

2.5.1.5 Pre-Milestone program review process. Programs are subjected to a thorough review, usually culminating in a formal meeting of the review group, in preparation for a milestone decision. The process typically ranges from several months for a major program to several weeks for a small project.

The additional time for the large programs is dictated largely by the sequential nature of the process where the program is reviewed by lower-level decision forums before reaching the forum in support of the decision authority.

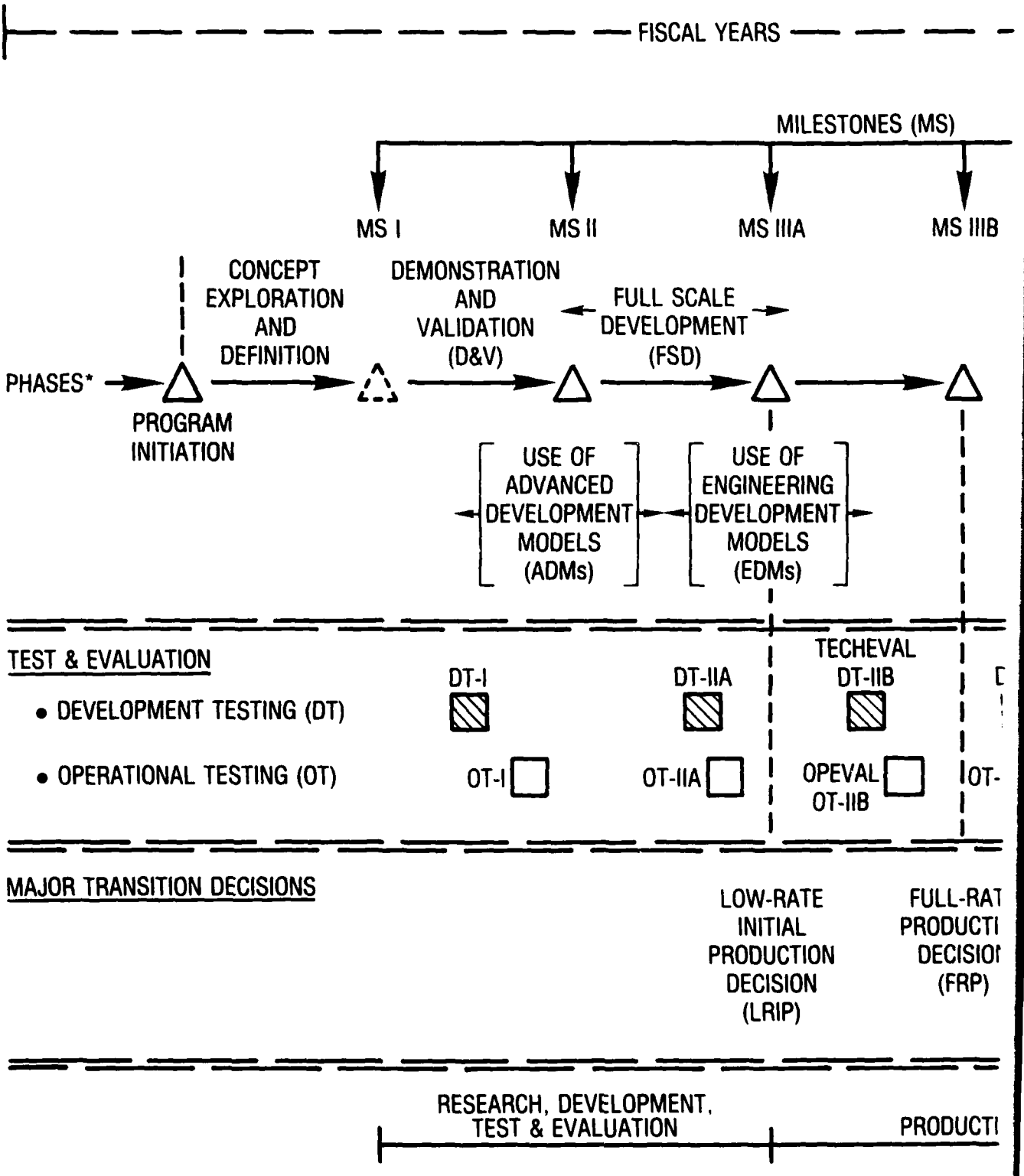
Preliminary activities usually include review of T&E reports, evaluation of relative risks, logistics review and certification, discussions to define and resolve issues and revision of drafts of the program documents. If all substantive issues have been resolved, the NPDM/MCPDM advisors may recommend that the decision authority issue his decision memorandum without a formal meeting of the review group.

2.5.1.6 Approval for production. The Navy exercises rigorous, high-level control of production approval to ensure that equipment reaching the fleet meets the intended standards of performance, reliability, survivability, maintainability and logistic supportability.

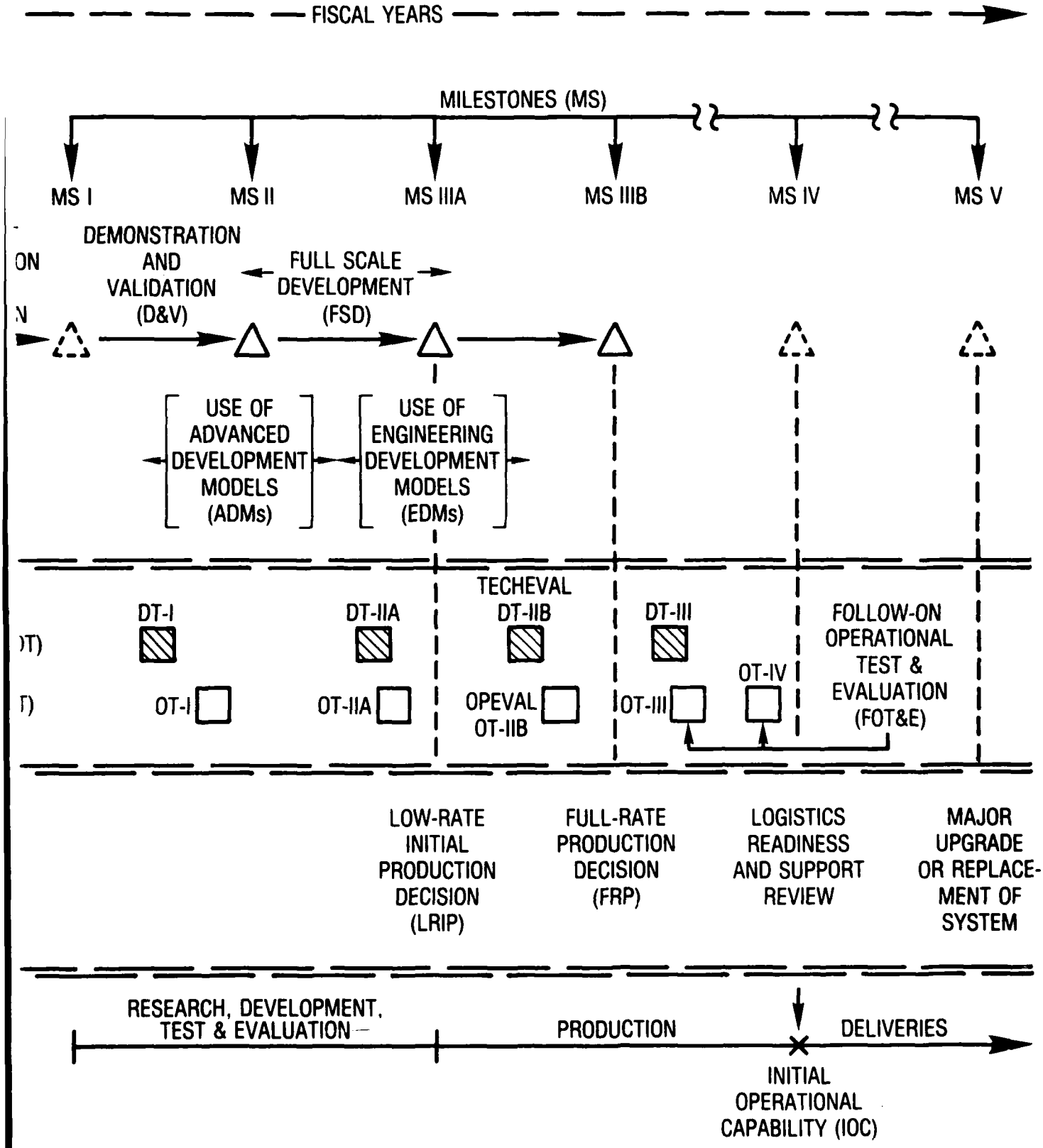
For many large programs, "approval for production" may involve a sequence of decisions over an extended time.

An initial low-rate initial production (LRIP) decision may occur at Milestone II or Milestone IIIA. Low-rate initial production provides both test resources and demonstration of readiness for

Exhibit 2-2
Typical Program Structure



*DOTTED-LINE EVENTS ONLY OCCUR AS REQUIRED; PROGRAM MAY PASS DIRECTLY FROM MS II TO MS IIIB, DEPENDIN(



S REQUIRED; PROGRAM MAY PASS DIRECTLY FROM MS II TO MS IIIB, DEPENDING ON CIRCUMSTANCES.

ACQUISITION CATEGORY (ACAT)	THRESHOLDS (FOR RDT&E AND PRODUCTION)	MILESTONES OR EVENTS*	PROGRAM DOCUMENTS	DECISION FORUM	DECISION AUTHORITY
I	$200 MILLION (RDT&E) OR $1 BILLION (PRODUCTION) OR AS DIRECTED BY THE SECRETARY OF DEFENSE (SECDEF)	PROGRAM INITIATION	MISSION NEED STATEMENT (MNS)	DEFENSE RESOURCES BOARD (DRB)	SECRETARY OF DEFENSE (SECDEF)
		MILESTONE (MS) I	SYSTEM CONCEPT PAPER (SCP) AND TEST AND EVALUATION MASTER PLAN (TEMP)	DEFENSE ACQUISITION BOARD (DAB)	
		MS II	DECISION COORDINATING PAPER (DCP) AND TEMP		
		MS III			
		MS IV			
		MS V			
II	$100 MILLION (RDT&E) OR $500 MILLION (PRODUCTION) OR AS DIRECTED BY THE SECRETARY OF THE NAVY (SECNAV)	PROGRAM INITIATION	OPERATIONAL REQUIREMENT (OR) OR REQUIRED OPERATIONAL CAPABILITIES (ROC)	(NONE)	SECRETARY OF THE NAVY (SECNAV)
		MS I	DECISION COORDINATING PAPER (DCP) AND TEMP	NAVY PROGRAM DECISION MEETING (NPDM) OR MARINE CORPS PROGRAM DECISION MEETING (MCPDM)	
		MS II			
		MS III			
III	HAS OR COULD HAVE A SIGNIFICANT IMPACT ON MILITARY CHARACTERISTICS	PROGRAM INITIATION	OR or ROC	(NONE)	DIRECTOR RDT&E, NAVY, OR COMMANDIN GENERAL, MCRADC
		MS II	TEMP	NPDM OR MCPDM	
		MS III			
IV	OTHER PROJECTS NOT PROVIDED A HIGHER ACAT	PROGRAM INITIATION	OR or ROC	(NONE)	NAVY OR MARINE CORF PROGRAM EXECUTIVE OFFICER (PEC
			TEMP	ACQUISITION REVIEW BOARD (ARB)	
		MS III			

*MILESTONES IV AND V OMITTED FOR ACAT II, III, AND IV PROGRAMS; MILESTONE I NORMALLY BYPASSED FOR ACAT III AND IV PROGF

TONES ENTS*	PROGRAM DOCUMENTS	DECISION FORUM	DECISION AUTHORITY	DECISION DOCUMENT
GRAM ATION	MISSION NEED STATEMENT (MNS)	DEFENSE RESOURCES BOARD (DRB)	SECRETARY OF DEFENSE (SECDEF)	ACQUISITION DECISION MEMORANDUM (ADM)
ONE (MS) I	SYSTEM CONCEPT PAPER (SCP) AND TEST AND EVALUATION MASTER PLAN (TEMP)	DEFENSE ACQUISITION BOARD (DAB)		
S II S III S IV S V	DECISION COORDINATING PAPER (DCP) AND TEMP			
GRAM ATION	OPERATIONAL REQUIREMENT (OR) OR REQUIRED OPERATIONAL CAPABILITIES (ROC)	(NONE)	SECRETARY OF THE NAVY (SECNAV)	PROGRAM OBJECTIVES MEMORANDUM (POM)
S I S II S III	DECISION COORDINATING PAPER (DCP) AND TEMP	NAVY PROGRAM DECISION MEETING (NPDM) OR MARINE CORPS PROGRAM DECISION MEETING (MCPDM)		ADM
GRAM ATION	OR or ROC	(NONE)	DIRECTOR RDT&E, NAVY, OR COMMANDING GENERAL, MCRADC	POM
S II S III	TEMP	NPDM OR MCPDM		ADM
GRAM IATION	OR or ROC	(NONE)	NAVY OR MARINE CORPS PROGRAM EXECUTIVE OFFICER (PEO)	POM
S III	TEMP	ACQUISITION REVIEW BOARD (ARB)		ADM

IV PROGRAMS; MILESTONE I NORMALLY BYPASSED FOR ACAT III AND IV PROGRAMS.

Exhibit 2-3
System Acquisition in the Department of the Navy

production. The Full-Rate Production decision occurs at Milestone III or IIIB.

Ref.: DOD Instruction 5000.

2.5.1.7 Goals and thresholds. "Goals and thresholds" are quantifiable objectives—which can be verified by measurement—to be accomplished at each phase of a Program. They normally relate to costs, schedule, operating and support capabilities, performance, and so forth. If thresholds are not achieved, the program's review can result in possible termination or re-orientation.

Ref.: DOD Instruction 5000.2; SECNAV Instruction 5000.2; OPNAV Instruction 5000.42

2.5.1.8 Acquisition streamlining. The Department of the Navy has a continuous, on-going effort to streamline the acquisition process. This involves reducing or eliminating hurdles which restrict the acquisition team's freedom to achieve required operational capabilities in the most timely and cost effective manner. The streamlining effort focuses primarily on requirements definition, contract terms and conditions, bid and proposal approaches, specifications development and selection, qualification data needs, and other elements in the process.

Ref.: DOD Directive 5000.43; DOD Instruction 5000.2; SECNAV Instruction 4210.7; OPNAV Instruction 5000.42

2.5.1.9 Mission Critical Computer Resources. Advanced, fully integrated weapons, avionics, intelligence, and command, control and communications technologies are gaining increasing importance in Navy and inter-service weapons and systems. The nuclei of such integrated systems are embedded Mission Critical Computer Resources (MCCR). These resources include both hardware and software. Principal applications encompass aircraft, shipboard systems, advanced submarine design and shore facilities as well as related support activities, e.g., development testing, computer design, training simulation, follow-on support, and so forth. A significant application of MCCR will be in retro-fitting in-service assets, thus extending the useful life of many major platforms.

An approved Computer Resources Life Cycle Management Plan (CRLCMP) is required by Navy at the Milestone II decision point for all hardware programs employing MCCR and for all software modifications, improvements, and upgrades that affect the combat capability or life cycle extension of present systems. Computer Resources is a section of the Integrated Logistics Support (ILS) plan.

Ref.: SECNAV Instruction 5200.32; OPNAV Instructions 3960.10, 5000.49 and 5200.28

2.5.1.10 Competition in acquisition. Competition in acquisition is fundamental DON policy (see 6.5.4).

Ref.: SECNAV Instruction 4210.10

2.5.2 Navy Acquisition Categories. Acquisition Categories (ACAT) identify generally the relative importance of Navy programs. Importance of programs typically relate to the RDT&E and/or the production cost enabling a system to achieve completion and an initial purchase level. The ACAT determines to a significant degree the

amount of senior attention, extent of documentation and the formality of the acquisition process given a specific Program. The ACAT characteristics are shown in Exhibit 2-3.

Ref.: SECNAV Instruction 5000.1, 5000.2

2.5.2.1 ACAT I. Acquisition Category I (ACAT I)—major programs—includes those with estimated RDT&E costs in excess of $200 million or procurement costs in excess of $1 billion, and such other programs as designated by the Secretary of Defense. All values for this purpose are in Fiscal 1980 dollars. There are two categories of ACAT I programs; those requiring SECDEF approval (ACAT ID) and those for which decision authority is delegated to SECNAV (ACAT IC) (see 2.5.6.2).

2.5.2.2 ACAT II. ACAT II programs are those in which expected RDT&E costs range between $100 million and 200 million, and/or procurement costs from $500 million to $1 billion and which do not meet ACAT I criteria, plus such programs as designated by the Secretary of the Navy.

2.5.2.3 ACAT III. ACAT III programs are designated by the Chief of Naval Operations (CNO) or the Commandant of the Marine Corps, or their designees in coordination with ASN(R,E&S) and ASN(S&L). ACAT III programs are below ACAT II in value. Programs in this category are those affecting the military characteristics of ships or aircraft, directly affecting the Navy's combat capability or systems, equipment, etc., which could be expected to interact with the enemy.

2.5.2.4 ACAT IV. ACAT IV programs are those not of a higher category.

2.5.2.5 Special interest programs. Programs may be designated a higher ACAT category even though they do not meet the threshold or definition of the Acquisition Category because of special interest by the Program Decision Authority or higher authority. They are designated as Special Interest by the Secretary of Defense, the DEPSECDEF, the USD(A), the Secretary of the Navy, the USN, or by an Assistant Secretary of the Navy. The reasons for such designation are broad, usually relating to an interrelationship the program may have to other programs, or program elements, a given technology or production technique, a new or unique contracting approach or an operational interest of the designating executive.

Ref.: SECNAV Instruction 5000.2;

2.5.3 Program Initiation. Programs are initiated from the conceptual thoughts of a variety of sources. Procedures for initiating the RDT&E/Acquisition process are aimed at making the earliest determination practicable as to the program's absolute necessity and affordability, and to ensure that the initiation process is tightly controlled by high-level decision makers. A program approved for initiation means that it will be included in the Navy's Program Objectives Memorandum (POM) based on an approved Operational Requirement (OR), Marine Corps Required Operational Capability (ROC) or Mission-Need Statement (MNS).

A process flow of actions and decision points of the Navy's RDT&E/Acquisition process is illustrated in Appendix F. Principal documents, as well as a general description of the acquisition process, are described in the following sections.

Ref.: DOD Directive 5000.1; DOD Instruction 5000.2; SECNAV Instructions 4210.7, 5000.1, 5000.2; OPNAV Instruction 5000.42

2.5.3.1 Tentative Operational Requirement. When a need for a new system is perceived and is believed affordable, the Office of the Chief of Naval Operations (OPNAV) forwards a Tentative Operational Requirement (TOR) document to the Space and Naval Warfare Systems Command (SPAWARSYSCOM) describing the desired capabilities of the proposed system in general terms. SPAWARSYSCOM reviews the TOR, identifies the Warfare Systems Engineering (WSE) and Warfare Systems Architecture (WSA) standards to complete the Development Options Paper (DOP). The TOR then is forwarded, with comments, to the appropriate Systems Command (SYSCOM) Commander for formulation and submission of a DOP.

2.5.3.2 Development Options Paper. The Systems Command which receives the Tentative Operational Requirement (TOR) from SPAWARSYSCOM explores optional approaches to possibly meeting the capabilities desired of the proposed new system. Based on the investigation of options, the Systems Command involved with the type of system being considered prepares a Development Option Paper (DOP) outlining the possible options ranging from modest or austere upgrades or modifications to existing systems to advanced, new systems affording great capability and at significant cost. Also, new systems usually require more time to achieve Initial Operational Capability (IOC), i.e., to get them into the field or "on the deck."

Options are presented either as a series of possible solutions or as graphs indicating capability vs. cost trade-offs for key system characteristics. The completed DOP is sent to SPAWAR for review for WSE and WSA standards compliance and then to the resource sponsor within the Office of the Chief of Naval Operations (OPNAV). The DOP must include consideration of a possible Non-Development Item (NDI) partial, modified or complete solution to the proposed systems capabilities (see 2.5.1.1).

2.5.3.3 Operational Requirement. The OPNAV Resource Sponsor selects the system approach to be pursued. This decision then is documented in an Operational Requirement (OR), and, in the case of an ACAT ID program, a Mission-Need Statement (MNS) (see 2.5.3.5). The issuance of the OR (or MNS) document firmly commits the OPNAV sponsor to support the Program both in the Program Objectives Memorandum (POM) and the budget process.

2.5.3.4 Marine Corps Required Operational Capability. The Required Operational Capability (ROC) document describes requirements for a system specifically to meet Marine Corps needs (as distinguished from Marine Corps adoption of systems or equipment developed by other Services) (see 2.5.9).

2.5.3.5 Mission-Need Statement. The Mission-Need Statement (MNS) is a concise definition and explanation of several factors relating to an ACAT ID program. These factors include the applicable Defense Guidance element, the threat, the Mission role of the system, optional concepts, cooperative opportunities, technologies involved, funding aspects and implications, possible constraints, and the acquisition strategy.

The Navy submits the MNS with its Program Objectives Memorandum (POM) (see 3.4.16). The Secretary of Defense approval of the program is reflected in the Program Decision Memorandum (PDM). This action officially sanctions the new start, which is then submitted for funding through the Budget process. This SECDEF decision is known as the Mission Needs Decision, which translates to Milestone "O" (see 2.5.4.1).

Ref.: DOD Instruction 5000.2 (Enclosure 2)

2.5.4 Decision Milestones. Review and control of the acquisition process is accomplished by "Go/No Go" decisions by the Program Decision

Authority (PDA) at key program transition points known as Milestones. Milestone decisions give particular emphasis to test results.

When a program is ready for transition to the next phase, appropriate data are prepared or updated, and a request to proceed is provided the appropriate PDA.

The Milestone decision document (except for Milestone III) includes thresholds and other evaluation criteria to be satisfied before the next Milestone is reached.

Ref.: DOD Directive 5000.1; DOD Instruction 5000.2; SECNAV Instruction 5000.2; OPNAV Instruction 5000.42

2.5.4.1 Milestone "O". Milestone "O" marks the approval of the initiation of a major (ACAT ID) program by the SECDEF's signature of the Acquisition Decision Memorandum (ADM). For these major systems, the Navy POM submission must be accompanied by a Mission-Need Statement. The approved ADM also authorizes the Navy to commence the next program phase leading to Milestone I.

It should be noted that, prior to Milestone I, the Project Manager is responsible for preparing a Test and Evaluation Master Plan (TEMP) (see 2.5.5.3, 7.5.3).

2.5.4.2 Milestone I. The Milestone I decision validates the requirements, based on a preliminary evaluation of concepts, costs, supportability, schedule, readiness goals and affordability. This Milestone decision approves the beginning of the Demonstration and Validation phase of the process and developing of the system sufficiently to support a future Milestone II decision.

A major consideration for all programs at the time of Milestone I is a provision for adequate RDT&E funding prior to Milestone II covering technical work, comprehensive design and engineering, and ILS planning. Acquisition streamlining (see 2.5.1.8) and design-to-cost assessment also are important and necessary conditions.

Milestone I normally will be eliminated for ACAT III and IV programs.

Ref.: DOD Directives 5000.43 and 4245.3

2.5.4.3 Milestone II. The Milestone II decision authorizes the beginning of Full-Scale Development (FSD). For most programs, Low-Rate Initial Production (LRIP) will occur during this phase. Milestone II is the process' most critical decision point inasmuch as it is a firm commitment to the program.

Milestone II approval is based on demonstration that:

- Engineering, rather than experimental effort, now is justified and required.
- Optimum technical and support approaches have been selected.
- Technical, operational, and support risks now have been assessed as "acceptable."
- The cost-effectiveness of the proposed system is considered favorable in comparison to competing, Navy-wide programs; and the cost of developing, producing, deploying, operating, and support is deemed affordable, even if overall Navy budget levels are reduced significantly.
- Technology requirements are available.

2.5.4.4 Milestone III. At this decision point, a transition to production will be authorized. Operational suitability, including logistics supportability, is a key factor in the production decision. The Secretary of Defense usually delegates a Milestone III decision for an ACAT I program to the Secretary of the Navy, assuming that thresholds are met.

For large programs, "transition to production" is more a phase in the process than a single point, and may involve successive Milestone decisions, i.e., IIIA for Limited Production and/or IIIB, Full-Rate Production (see 2.5.1.6).

2.5.4.5 Milestone IV. The Milestone IV review, if needed, normally occurs after the system has been deployed in the fleet or in the field for one to two years. The Milestone IV decision defines actions and identifies resources needed to ensure that operational readiness and support goals are achieved.

2.5.4.6 Milestone V. Milestone V, if needed, occurs five to ten years following a system's initial deployment. This Milestone review centers on the system's current state of readiness, suitability and operational effectiveness to determine if major upgrades are needed or if sufficient deficiencies exist to justify possible replacement of the system, facility or asset.

2.5.4.7 Other decisions. In addition to Milestone decisions, the Program Decision Authority may be required to review and make decisions concerning a program because of such factors as Congressional funding actions or anticipated serious breaches in a program's thresholds or goals.

2.5.4.8 Milestones for ship programs. Ship design and development phases have traditionally been identified by unique terminology. Shipbuilding program phases and milestones are: conceptual design and trade-offs (mission need determination) (Program Initiation) (Milestone O, if needed); start of preliminary design (Milestone I); decision for lead ship design (during contract design) (Milestone II); decision for follow ships (Milestone III); lead ship initial in-service review (Milestone IV, if needed); in-service mid-life modernization (Milestone V, if needed).

2.5.5 Program Documentation. A milestone decision results in a document which, upon the decision, becomes a "contract" between the Decision Authority and the Program Manager, committing the PM to the successful completion of work leading to the next milestone decision.

Such documents typically address the program's purpose and objective, expected benefits from successful development, anticipated costs, assessment of risks, the acquisition strategy and the program's goals and thresholds. The document's attachments include specifics concerning goals and thresholds, profile of work to be accomplished—including the schedule—and a description of funding requirements.

Exhibit 2-3 graphically indicates the relationship among the various Milestones, the nature of work to be accomplished in each phase of the process, and general timing of different testing activities.

Ref.: DOD Directive 5000.1; DOD Instruction 5000.2; SECNAV Instruction 5000.2; OPNAV Instruction 5000.42

2.5.5.1 System Concept Paper. A System Concept Paper (SCP) is required for all ACAT I programs at the Milestone I decision point. The SCP identifies program options based on initial studies and analyses of design concepts, alternative acquisition strategies, planned operational capabilities, readiness support and personnel requirements, and cost estimates. The SCP is limited to twelve pages, excluding annexes.

2.5.5.2 Decision Coordinating Paper. A Decision Coordinating Paper (DCP) is prepared for ACAT I and II programs for a Milestone II decision, and is updated for the Milestone III decision. The Decision Coordinating Paper is similar in outline to the System Concept Paper, although somewhat more specific in content. The additional data of the DCP relates to an expanded description of the selected option and an assessment of technological risks. DCPs for ACAT I and for ACAT II programs are limited,

respectively, to 18 and 10 pages, excluding annexes.

2.5.5.3 Test & Evaluation Master Plan. A Test & Evaluation Master Plan (TEMP) is required for all programs at all Milestone decision points. The TEMP also is the controlling document for ACAT III and ACAT IV programs.

Ref.: DOD Directive 5000.3; OPNAV Instruction 3960.10

2.5.5.4 Non-Acquisition Program Definition Document. The Non-Acquisition Program Definition Document (NAPDD) defines and gives direction to Advanced and Engineering Development programs which explore technologies or integrate systems not directly related to procurement. Small Non-Acquisition (non-ACAT) programs, i.e., less than $200,000 per year or less than $1 million in total cost, do not require NAPDDs.

2.5.6 Decision Forums. The aforementioned documents provide background for six milestone decision meetings concerned with R&D and production acquisition action. To a greater or lesser degree they center on the same salient points: mission purpose, required uniqueness as compared to existing systems, evaluation of risks, funding and scheduling aspects, the acquisition strategy and a discussion of test and evaluation findings, conclusions, and recommendations. In appropriate cases, inter-service applications receive close attention.

Ref.: DOD Directive 5000.1; DOD Instruction 5000.2; SECNAV Instructions 5000.1, 5000.2

2.5.6.1 Defense Resources Board. The Defense Resources Board (DRB) assists the Secretary of Defense in managing the entire planning, programming and budgeting process (PPBS), including the initiation of major programs. The DRB is chaired by the SECDEF and the SECNAV is the Navy member. The CNO and the CMC also are Navy invitees and usually attend (see E9.6). The DRB is the decision forum for initiation of ACAT I programs.

2.5.6.2 Defense Acquisition Board. The Defense Acquisition Board (DAB) is the senior Department of Defense acquisition review board. Chaired by the Defense Acquisition Executive, i.e., the Under Secretary of Defense (Acquisition), the DAB helps the DAE with Milestone Decisions and and with program reviews, policy formulation, and acquisition and resource recommendations. The DAB is the primary forum for DOD components to provide advice and counsel through the DAE to the SECDEF. The Navy member is the Navy Acquisition Executive. One additional Navy representative may attend. The DAB reviews major programs for which decision authority has not been delegated to the Secretary of the Navy (ACAT ID programs).

The DAB is supported by 10 committees which principally identify issues to be brought before the DAB and make recommendations (see E9.2). The DAB is the decision forum for Milestones I through V for ACAT ID programs.

Ref.: DOD Directives 5000.1, 5000.49

2.5.6.3 Navy and Marine Corps Program Decision Meetings. A Navy Program Decision Meeting (NPDM) and a Marine Corps Program Decision Meeting (MCPDM) are Department of Navy (DON) forums for program reviews and Milestone decisions when the Program Decision Authority directs (see E9.7).

The NAE chairs ACAT I and II NPDMs and MCPDMs; the ASN (R,E&S) chairs ACAT III meetings for non-shipbuilding programs through Milestone IIIA (Low-Rate Initial Production

(LRIP)). The ASN(S&L) chairs all ACAT III meetings for shipbuilding programs and for non-shipbuilding programs Milestone IIIB (Full-Rate Production) and subsequent meetings. The NPDM/MCPDM is the decision forum for Milestones I, II and III for ACAT II and ACAT III programs.

Ref.: SECNAV Instructions 5000.2, 5420.188

2.5.6.4 Acquisition Review Board. The Acquisition Review Board (ARB) reviews all programs for the appropriate SYSCOM. The ARB is chaired by SYSCOM level executives, depending on the level of the program, e.g., the SYSCOM Commander or Vice Commander chairs ACAT I and II program meetings. The ARB is the Decision Forum for all Milestone decisions regarding ACAT IV programs (see E9.8).

2.5.6.5 Ship Characteristics and Improvement Board. The Ship Characteristics and Improvement Board (SCIB) is a special panel of the CNO Executive Board (CEB). It provides recommendations to CNO and performs coordinating functions for ship acquisition programs (see E9.5 and E9.5.1).

Ref.: OPNAV Instruction 5420.2

2.5.7 Decision Documents. Unlike the Program Documents, discussed in Section 2.5.5, decision documents record the actions taken by the Program Decision Authority at program initiation and at the various Milestone decision points. The principal decision document is the Program Objectives Memorandum (POM) inasmuch as funding—amount or timing—is the central program issue in any acquisition decision. The funding decision is further amplified by a decision memorandum.

2.5.7.1 Acquisition Decision Memorandum. The Acquisition Decision Memorandum (ADM) is used to document the Milestone decisions of the Program Decision Authority (PDA) for *all* ACAT program levels. For example, in the ADM for a DAB (ACAT ID) meeting, the SECDEF documents his decision, establishes program goals and thresholds, reaffirms established needs and program objectives, authorizes any exception to program policy and provides the OSD, the OJCS and the DON direction and guidance for the next acquisition phase.

Ref.: DOD Directive 5000.1; DOD Instruction 5000.2

2.5.8 Ship Requirements and Specifications. Requirements and specifications for ships evolve through a systematic User-Supplier dialogue designed to produce a ship type that maximizes military worth in relation to life-cycle cost.

Top Level Requirements (TLR) and Top Level Specifications(TLS) develop as the ship design progresses. Requirements are not frozen until the feasibility and cost of meeting various levels of performance have been confidently established.

Ship characteristics and specifications are submitted to the SCIB for approval.

Ref.: OPNAV Instructions 5420.2, 9010.300

2.5.9 Documentation of Marine Corps Requirements. The Required Operational Capability (ROC) document is a brief statement of a specific operational capability that is required in the mid-range period. It includes a statement of the need, a description of the threat or operational deficiency to be overcome, minimum essential

performance bands, concepts of employment, technical assessment, energy effectiveness impact and broad-based estimates of funds and personnel resources. The ROC is the primary basis for initiating and formalizing the Marine Corps acquisition process. The document will be refined during the development process. However, the basic statement of need normally will not change unless the threat, operational concept or the deficiency changes. The ROC solicits from the MCRDAC or other appropriate Service agency a development proposal in which alternatives and tradeoffs are considered (see 2.5.3).

Many Marine Corps systems are developed by other armed services, particularly the Army. In such cases, the requirement documents of the developing services are used to meet MC landing force needs. This is accomplished with the addition of a Marine Corps cover letter. The Navy OR and other service requirement documents, when produced to cover Marine Corps needs, and the ROC are drafted by CG, MCCDC.

Ref.: Marine Corps Orders 3900.4, P5000.10

2.6 PLANNING FOR SUPPORT

Ref.: DOD Directive 5000.1; DOD Instruction 5000.2, 5000.39 (SECNAV 5000.39); SECNAV Instructions 5000.2, 5000.39; OPNAV Instructions 4105.3, 5000.49

2.6.1 Integrated Logistic Support Concept. Integrated Logistic Support (ILS) is the management and technical activity aimed at integrating readiness and support considerations into system design, schedule, cost and acquisition.

Readiness is achieved through creating the design/support interface, developing maintenance planning, and implementing cost-effective life-cycle support. ILS planning influences design and evolves life-cycle support through Logistics Support Analysis (LSA). Resources to achieve readiness and availability are given equal weight with performance considerations during competitive source selections. ILS assessment and subsequent tradeoffs serve to provide the required support during the operations phase at minimum cost.

The elements of logistic support, planned in an integrated manner, are:

- Maintenance
- Manpower and personnel
- Equipment
- Supply
- Technical data
- Training
- Computer resources
- Facilities
- Packaging, handling, storage and transportation information
- Design interface.

2.6.2 New Facilities for RDT&E. Construction of new facilities required to support RDT&E projects involves special problems. The funds for constructing facilities are provided by the Military Construction (MILCON) appropriation. Except for very minor construction or modifications, it is illegal to use RDT&E funds to pay for construction. Thus, the need for RDT&E facilities must be anticipated long in advance, and measures taken to meet the requirements for obtaining funds through the MILCON appropriation.

Ref.: DOD Instruction 7040.4 (SECNAV 7045.9)

2.6.3 Personnel. Personnel needed for development or deployment of a new system are a

special planning problem owing to the leadtimes involved. Often training may take longer than development and production of the hardware they are to operate.

In addition to the training leadtimes, controls necessitate advance preparation. All personnel levels are tightly controlled within the five-year Defense Program (FYDP). Thus requirements must be anticipated long in advance and the measures taken to secure timely authorizations.

Ref.: OPNAV Instructions 1500.8 and 5000.50

2.7 Cost Considerations

It is the obligation of Defense management to provide the highest mission capability possible within the resource limits the country chooses to allocate to Defense. DOD Directive 5000.1 states that a cost-effective balance must be achieved among acquisition costs, ownership costs ..., and system effectiveness in terms of the mission to be performed.

This section deals with RDT&E and acquisition concepts, policies and institutional arrangements related to cost considerations of mission effective, cost-effective and affordable weapons.

Ref.: DOD Instructions 4245.3, 7000.3 (SECNAV 7700.5), 7041.3 (SECNAV 7000.14 and OPNAV 7000.18); DOD Directives 5000.1, 5000.4 (SECNAV 7000.19); SECNAV Instructions 5000.2, 7000.14, 7000.19, 7700.5; OPNAV Instruction 7000.17, 7000.18; DON Programming Manual

2.7.1 Economic Analysis. Economic analysis is a means of systematically considering benefits and cost in decision-making, particularly in investment decisions. In conducting economic analysis cost and benefit, objectives, and alternatives are identified and compared through the use of an appropriate analytical framework.

Economic analyses are required to support the acquisition of major systems. The results of these analyses are summarized in the DCP or other documentation, and provide the basis for subsequent program evaluation.

2.7.2 Design-to-Cost. In the planning of development programs, cost parameters reflect the cost of acquisition and ownership. Discrete cost projections (e.g., unit production cost, operating and support cost) are established as "design-to" requirements. System development is continuously evaluated against these design-to-cost goals. Design-to-cost applies to most systems to be produced in significant quantities.

2.7.3 Cost Estimation and Analysis. Much emphasis is placed on improving estimates of probable cost of developing, procuring, operating and supporting proposed systems. Cost estimating dominates every phase of Navy planning, programming and budgeting. Development and acquisition costs, along with recurring ownership costs, must be estimated accurately if realistic Navy programming and decision-making are to result.

2.7.3.1 Cost analysis responsibilities. Cost estimates for a proposed program are prepared by the Principal Developing Activity (PDA) and are updated annually. Independent cost estimates are made by the Naval Center for Cost Analysis (NCA) before initiation of the DAB process. The DOD Cost Analysis Improvement Group (CAIG) then provides the DAB with a review and evaluation of both the estimates prepared by the PDA and the independent estimate prepared by NCA.

2.7.3.2 Cost estimating methodologies. For estimating costs of weapon systems, the three most common approaches are: Engineering or "bottom-up," parametric, and analogy. Each

relies on a work breakdown structure (WBS) that defines the work required to develop, procure, operate, and support the system. The WBS, described in MIL-STD-881, is outlined in C11.

Engineering estimates are based on detailed system specifications and drawings, industrial engineering standards, etc.; total cost is estimated by summing the estimated costs for individual elements of the effort being analyzed. These estimates are sensitive to design and manufacturing changes and can identify cost driving elements. Because they require detailed information, engineering estimates are less useful for systems that are not fully defined.

Parametric estimates, based on relationships derived from "actual" costs, use system or program parameters (e.g., size, complexity, development time) to estimate costs. These statistically derived estimates require historical cost data on similar systems. They are sensitive to major design or program changes and can evaluate cost drivers and give quick results. Normally less detailed than engineering estimates, they can be as accurate.

Cost estimates by analogy rely on relationships to costs experienced for similar items (e.g., ratio of hardware to engineering costs based on ratios experienced in similar programs). These estimates require limited historical data and can be adjusted for differences between systems. Accuracy depends on similarity to historical programs and adequacy of adjustments. Analogies may not identify cost drivers, so may not assess the impact of design or program changes.

2.7.3.3 Classes of baseline cost estimates. Often, what are erroneously termed "cost overruns" result from comparing the actual cost of developing a system against cost estimates made before either the system was fully defined or the number to be procured was established. Cost estimates range from the first rough estimate to figures based on audits of actual costs incurred. OPNAV Instruction 7000.17 describes seven levels of cost estimates ranging from Class A—highest level of confidence—to Class X—a "directed or modified estimate" (see C2).

The term "cost growth" refers to the increase in an estimate. When it occurs the bases of the current and previous estimates must be carefully examined. Cost changes resulting from such causes as system design change, inflation, etc. should be called cost growth, rather than "cost overruns." A cost overrun results when the incurred cost of a program exceeds the target cost.

2.7.3.4 Standard weapon system costs. Confusion frequently results from the release of cost estimates of weapon systems that were based on different cost elements. To eliminate this confusion, standard definitions are used for "Flyaway Cost," "Weapon System Cost," "Procurement Cost" and "Program Acquisition Cost" (see C8).

2.7.3.5 Navy Headquarters Planning System/Navy Headquarters Budget System. The Navy Headquarters Planning System/Navy Headquarters Budget System (NHPS/NHBS) is essentially a data bank to provide and display Navy program and cost information in a variety of reports. Data are expressed either in appropriation structure or in DOD programming structure, using computerized data processing.

2.7.3.6 Life Cycle Cost (LCC). Life cycle cost is the total cost to the government for a system's development, acquisition, operation and logistic support over a defined life span. Life cycle cost estimates are part of economic analysis, and thus are required for all major programs (see discussion of economic analysis in paragraph 2.7.1).

2.7.4 Incremental Acquisition Strategy. Even with the ultimate ability to project true program cost, there still is great uncertainty associated with the technical performance, i.e., what can be achieved, how long it will take, how much it will cost and what will be the value of resulting operational capabilities. Thus, it is policy to pursue development programs through an incremental

strategy under which program decisions on further work are made on the basis of successfully passing Milestones. Programs are structured and resources allocated so that demonstration of achievement objectives is the pacing function. Further, as the advancing program yields improved information, practical tradeoffs are made between system capability, cost and schedule.

A demonstration milestone funding strategy, also practiced by Congress, requires submission of the latest test results along with requests for funds for procurement of weapons (see H1).

2.7.5 Cost Measurement and Reporting. As programs unfold, costs are collected and cost information is reported to various monitors and decision makers. For selected major programs, one primary report is the SAR (Selected Acquisition Report). The SAR is designed for the Office of the Secretary of Defense, and for OSD to furnish information to the Congress and the GAO.

SARs include past information on costs, schedule and technical achievements, and "current estimates" of the system's operational/technical characteristics, as well as when it is likely to be available and its probable cost.

SARs are submitted annually with the President's Budget and quarterly if (1) a total program increases or decreases by 5%, (2) a schedule slips by six months, or (3) a major Milestone decision occurs.

Other cost measurement and reports are discussed in Chapter 6 (6.7.4).

SELECTED REFERENCES ON R&D PLANNING

DOD Directive 5000.1, "Major and Non-Major Defense Acquisition Programs," establishes fundamental overall policy for systems development and acquisition. The management principles in the directive are applicable to all programs.

DOD Instruction 5000.2, "Defense Acquisition Program Procedures."

DOD Directive 5000.3, "Test and Evaluation."

SECNAV Instruction 5000.1, "Major and Non-Major Acquisition Programs," sets forth policies and procedures for all Navy acquisitions.

SECNAV Instruction 5000.2, "Major and Non-Major Acquisition Program Procedures," sets forth procedures for all Navy acquisition programs.

SECNAV Instruction 5000.39 promulgates DOD Directive 5000.39, both entitled "Acquisition and Management of Integrated Logistic Support (ILS) for Systems/Equipments." These directives establish policies and set forth principles for the coordinated planning, development, and acquisition of logistic resources required to support Navy and Marine Corps systems and equipment.

OPNAV Instruction 5000.42, "Research, Development and Acquisition Procedures," prescribes RDT&E/acquisition program initiation and operational requirements establishment.

Department of the Navy Programming Manual. Chapter II, "Planning," is the primary source of official information on the Navy Planning System.

ONR Instruction 3910.2, "Naval Research Requirements and the Naval Research Program Structure."

Marine Corps Order 3900.4, "Marine Corps Program Initiation and Operational Requirements Documents."

Marine Corps Order P-5000.10, "Systems Acquisition Management Manual."

Marine Corps Order 5000.15, "Marine Corps Systems Acquisition Management Policy."

Chapter 3
PROGRAMMING

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Chapter 3
PROGRAMMING

Programming, the subject of this Chapter, is the portion of the Planning, Programming and Budgeting System (PPBS) which links planning to budgeting. It is the process by which plans are converted into time-phased and fiscally-oriented programs. The Department of the Navy Programming System is the process within which decisions are made by the Chief of Naval Operations, the Commandant of the Marine Corps, the Secretary of the Navy, and the Secretary of Defense concerning modernization (including R&D), force levels, readiness, and sustainability. For convenience this chapter includes material on planning and budget to provide a comprehensive picture of the PPBS. A more detailed discussion of budget formulation is reserved to Chapter 4. The justification of the budget to Congress is also addressed in the next chapter under 4.8.

A flow chart of the entire PPBS process is shown in 3.5.

It is important that the Department of Defense programming system be thoroughly understood. Its objectives and the manner in which it is developed are of particular importance to RDT&E executives because the initiation of any system first must be approved, programmed and funded. To gain such approval and financing, the system must be justified in competition against optional means of achieving the proposed objectives and other uses for the same resources.

3.1 OBJECTIVES OF DOD PROGRAMMING SYSTEM

The DOD Programming System is designed primarily to accomplish the following eight objectives:

- Relate resources to Defense missions and requirements.
- Link planning to budgeting.
- Establish programs oriented to "Mission" rather than to department function.
- Provide a framework for Inter-Service competition to provide required mission forces.
- Establish a rational program structure which encompasses all Defense Activities.
- Ensure that cost effective studies support optional force structure or weapon system proposals.
- Evaluate programs on a continuous basis.
- Establish a single channel for major decisions on Defense programs.

3.2 DOD FIVE YEAR DEFENSE PROGRAM

The Five Year Defense Program (FYDP) is a current summary of all Department of Defense programs. It relates manpower and financial resources to military programs. The FYDP describes accomplishments to date and future goals in support of national strategies. It includes program manpower, dollars, and force structure from the beginning of the PPBS in Fiscal Year 1962, through the current year plus data for each of the ensuing six fiscal years.

Ref.: The Department of the Navy Programming Manual which is the Department's standard reference for operation of the DOD PPBS

3.2.1 Program Element. The Program Element (PE) is the basic building block of the Five Year Defense Program (FYDP). It describes the mission, the responsible organization, and the estimated costs. Currently, there are approximately 2,900 Program Elements in the FYDP and 948 Navy Program Elements of which about 300 are for RDT&E activities (see C7.2 and Exhibit C-3).

Ref.: The DOD Program Structure Codes and Definitions Handbook DOD 7045.7-H); DON Program Manual, Appendix A

3.2.2 Program. A Program comprises several Program Elements developed to accomplish a defined objective. It specifies what is to be done, when, and the resources proposed to achieve it. Program Elements either complement or substitute for each other. It is important to distinguish between the meaning of "Program" as defined in the PPBS described here, and its definition in reference to the acquisition process which is discussed in Section 2.5.2.

3.2.3 Major Programs. There are 11 classifications of Major Programs. These classifications are listed in C7.1.

3.3 FY 1992-97 PLANNING, PROGRAMMING AND BUDGETING

The most recent cycle of the Planning, Programming and Budgeting System (PPBS) began in July 1988, and will develop a six-year program for the years FY 1992 through FY 1997. Programming and budgeting for this cycle will culminate with submission of a two-year budget request to Congress for FY 1992 and FY 1993 in January 1991. The previous cycle was in its final stages in the Fall of 1988, and culminates with the submission of a two-year budget request to Congress for FY 1990 and FY 1991 in January 1989. The major processes and documentation scheduled in the FY 1992-97 cycle include:

Navy Program Planning (July 1988 - December 1989)

- POM Serials
- Warfare Appraisals
- Baseline Assessments
- Summary Warfare Appraisal (SWA)
- Readiness and Sustainability Appraisal
- Sponsor Program Proposal (SPP)
- Sponsor Program Proposal Document
- Post-SPP Program Assessments and Heads-up Report
- Mid-POM Review (MPR)
- Force Posture Statement
- Integrated Priority List (IPL)
- DON Consolidated Planning and Programming Guidance (DNCPPG)
- Total Force Report to Congress

OSD Planning (February 1989 - November 1989)

- Joint Strategic Planning Document
- Defense Guidance

OSD Execution Review (May 1989 - June 1989)

Navy Programming (December 1989 - July 1990)

- POM Serials
- Sponsor Program Proposals
- Sponsor Program Proposal Document
- Post-SPP Program Assessments and Heads-up Report
- Total Force Report to Congress
- Program Objectives Memorandum
- Joint Program Assessment Memorandum
- Program Decision Memorandum

Budget Formulation (May 1990 - January 1991)

- Program Budget Decisions
- Major Budget Issues
- Program Management Proposal

3.3.1 Navy Program Planning. Navy Program Planning encompasses an initial round of program analyses (warfare appraisals and baseline assessments) based upon issue submissions from the Commanders in Chief (CINCs), component commanders, and claimants, goes on to consideration of sponsor program proposals updating the Navy program database for the years FY 1990 through FY 1997, and results in the submission of a *Force Posture Statement* by the SECNAV to OSD on 1 April 1989. After an update of the warfare appraisals and the baseline assessments in the Fall of 1989, Navy Program Planning is completed with the development and issuance of the DON Consolidated Planning and Programming Guidance by the SECNAV on 1 December 1989.

3.3.2 OSD Planning. OSD planning begins with the issuance of the President's national security objectives and policies on 1 February 1989. Fiscal guidance derived therefrom is issued to the Departments as a basis for their Force Posture Statements. The Chairman of the Joint Chiefs of Staff produces a capability assessment of the Department Force Posture Statements and a fiscally constrained military strategy for review by the President. The *Defense Guidance (DG)* is drafted by OSD and commented upon by the Departments; upon receipt of further Presidential direction, the DG is revised as necessary and is issued with accompanying fiscal guidance not later than 30 November 1989.

3.3.3 OSD Execution Review. The OSD Execution Review provides an opportunity within the PPBS process for senior leadership (Defense Resources Board) to review the results of program and policy initiatives and to assess the effectiveness of past problem solutions. The execution review will focus on the results of programs already funded:

- What capabilities are they providing?
- Are the capabilities consistent with expectations?
- What future changes in capabilities can be expected?

Findings from the execution review will influence the future defense program and the content of the DG and will identify needs for special studies and lead to new directions for current efforts.

3.3.4 Navy Programming. Navy Programming commences upon the issuance of the DG and the DON Consolidated Planning and Programming Guidance and includes a second round of Sponsor Program Proposals, program assessments, etc., and results in the submission of the Program Objectives Memorandum (POM) and its subsequent review by OSD. It is completed with the issuance of the Program Decision Memorandum (PDM) by OSD in July 1990.

3.3.5 Budget Formulation. Upon completion of the POM submission, the Navy immediately begins development of a detailed budget based thereon. An internal Navy budget review is completed by August 1990, incorporating the results of the internal review and OSD direction in the PDM. Following an OSD review of the proposed budget and approval by the President the final budget amounts and supporting data are submitted to the Congress in January 1991.

3.4 PRINCIPAL DOCUMENTS FOR FY 1992-97 PLANNING, PROGRAMMING AND BUDGETING

A brief description of the principal documents used in the PPBS to update the Five Year Defense Program (FYDP) and the Department of the Navy Five Year Program (DNFYP) is provided herein.

3.4.1 POM Serials. These memoranda form a set of instructions establishing Navy procedures for participation in the planning and programming processes of DOD. They are issued by the Director, General Planning and Programming Division (OP-80), under the direction of the Chief of Naval Operations. The memoranda encompass CNO programming and fiscal guidance as well as procedural guidance. For the FY 1992-97 PPBS cycle they are numbered POM 92-1, POM 92-2, etc.

3.4.2 Warfare Appraisals. The warfare appraisals will evaluate the balance of Navy warfighting capability, risk, and affordability in the context of the Maritime Strategy Appraisal. Appraisals will provide a fiscally constrained and issue/capabilities oriented overview of the FYDP. Each appraisal will provide the analytical basis for CNO decisions regarding priorities and resource programming. Appraisal topics include Technology and Development, Space Programs, Strike/Anti-Surface Warfare, Anti-Air Warfare, Amphibious Warfare, Electronic Warfare, etc., as well as Logistics and Manpower.

3.4.3 Summary Warfare Appraisal. The Summary Warfare Appraisal is a summation of Navy warfighting capabilities as indicated in the individual appraisals. It will include force structure and modernization prioritization as well as alternative program reductions.

3.4.4 Readiness and Sustainability Appraisal. This appraisal addresses readiness and sustainability issues regarding ships, aircraft, and munitions and related concerns raised by the CINCs or the Maritime Strategy and Strategic Logistics Appraisals. The purpose is to identify more cost effective alternatives which will preserve and enhance readiness and sustainability. It also provides analyses of force level projections against requirements to identify potential problems or savings.

3.4.5 Baseline Assessments. Baseline Assessments identify the minimum essential resources required to support a specific program or set of programs at a stated force level. They support program development by providing resource sponsors with rational baseline costs for projected force levels and by identifying support needs for particular programs. They provide a benchmark for determining the adequacy of resource allocation in Sponsor Program Proposals (SPPs).

3.4.6 Sponsor Program Proposal. The Sponsor Program Proposals (SPPs) adjust the baseline FYDP to bring resource sponsor programs into compliance with CNO and higher level fiscal guidance. During the FY 1992-97 PPBS cycle SPPs will be prepared in support of the Mid-POM Review (February/March 1989) and also for the development of POM-92 (December 1989/March 1990).

3.4.7 Sponsor Program Proposal Document. The Sponsor Program Proposal Document (SPPD) highlights major changes to the resource sponsor's program in his SPP, and documents his response to fiscal and program guidance, warfare appraisals, baseline assessments, and CINC/Component Commander and claimant input.

3.4.8 Post-SPP Program Assessments and Heads-up Report. The Post-SPP Program Assessments will analyze the degree to which the SPP funding meets guidance and achieves the required program balance. Assessments are to be performed in such areas as manpower, personnel and training; logistics; ship maintenance/ modernization; physical security; and research, development and acquisition. A "Heads-up" report identifying significant deficiencies will be submitted by the assessment sponsor one week in advance of the assessments.

3.4.9 Mid-POM Review. The Mid-POM Review (MPR) will be carried out during February/March 1989. It will review the Navy FYDP for FY 1990 to FY 1994 and will extend the Navy FYDP through FY 1997 by means of a round of SPPs. The revised Navy program will be contained in a Force Posture Statement submitted to OSD on 1 April 1989; it will be constrained by the new President's

fiscal guidance as interpreted by OSD. The MPR is intended to accommodate whatever course of action is adopted by the new administration by making available programmatic alternatives. Within the Navy the review will be accomplished based upon issue input from Unified Commanders, Component Commanders, and claimants, and also upon a cycle of warfare appraisals and baseline assessments.

3.4.10 Force Posture Statement. This document will transmit the revised Navy program for FY 1990 through FY 1997 based upon the results of the Navy Mid-POM Review (see 3.4.9) to OSD on 1 April 1989. The Force Posture Statement will be the basis for the OSD planning cycle leading to the issuance of the Defense Guidance on 30 November 1989.

3.4.11 Integrated Priority List. The Integrated Priority List (IPL) will be submitted by the Unified Commanders in the Fall of 1989 and will be the primary vehicle for input of their concerns into the development of the Program Objectives Memorandum (POM). Component Commanders will prepare point papers giving a programmatic focus to the IPLs. Official feedback will be provided to the Unified and Component Commanders documenting Navy response in the POM to their concerns.

3.4.12 DON Consolidated Planning and Programming Guidance. The DON Consolidated Planning and Programming Guidance (DNCPPG) states the decisions of SECNAV and CNO with respect to priorities and programming principles to be used in the development of the POM. Its issuance concludes the Navy Program Planning phase of the PPBS. Development of the DNCPPG in the Fall of 1989 will be based upon consideration of the updated warfare appraisals, and the CINC/Component Commander inputs. Issuance is scheduled for 1 December 1989.

3.4.13 Total Force Report to Congress. The Total Force Report to Congress is an annual report designed to relate planned force structure to active and reserve manpower plans. OP-06 will distribute an outline of the draft FY 90 Total force Report to Congress in November 1988, and the published version in March 1989; similarly, the draft outline of the FY 91 report will be distributed in November 1989, and the published version in March 1990. Resource sponsors will consider the drafts in developing their SPPs, and OP-095 in coordination with OP-06 will consider in their Post-SPP assessments the agreement of the published reports with Navy plans.

3.4.14 Joint Strategic Planning Document. The Joint Strategic Planning Document (JSPD) is developed by the Chairman of the Joint Chiefs of Staff (CJCS) for use in preparing the Defense Guidance (see 3.4.15). It is a comprehensive military appraisal of the worldwide threat to United States interests and objectives, and includes recommended military objectives and strategies to achieve national goals.

3.4.15 Defense Guidance. The Defense Guidance (DG) is the basic planning document upon which all Defense programming is based. It includes policy, strategy, force planning, resource allocations and fiscal guidance as well as CJCS, and counter-threat opportunity assessments and discussions of major issues requiring top management attention. The DG for the FY 92-97 PPBS cycle is to be developed in consultation among the SECDEF, the CJCS, (see discussion of the JSPD in 3.4.14) and the unified and specified commanders. Presidential direction pursuant to SECDEF recommendations is expected by 30 October 1989. The approved DG is scheduled to be issued on 30 November 1989.

3.4.16 Program Objectives Memorandum. The Program Objectives Memorandum (POM) is the document in which each military department and Defense Agency recommends and describes its total program within the resources and policy parameters specified by the DG (see 3.4.15). It will provide the Department force level objectives approved by SECNAV for the six years of the FY 92-97 PPBS cycle and will describe major system new starts and significant base or force structure

changes for the ten year period beyond FY 1997. Resource levels are similarly projected for six years (personnel, procurement, research and development, and operational programs). The POM is scheduled to be submitted to OSD on 1 April 1990.

3.4.17 Joint Program Assessment Memorandum. The Joint Program Assessment Memorandum (JPAM) is a risk assessment by the CJCS of the composite force recommendations in the POMs (see 3.4.16) submitted by the services and Defense Agencies. It is a major input in the Defense Resources Board (DRB) consideration of the POM submissions and associated issues which leads to the issuance of the Program Decision Memorandum (PDM) (see 3.4.18).

3.4.18 Program Decision Memorandum. The Program Decision Memorandum (PDM) records SECDEF decisions on the POM (see 3.4.16) and forms the basis for the development of the FY 92-93 budget request to Congress.

3.4.19 Program Budget Decisions. OSD segregates the Service budgets into discrete segments for purposes of review and decision. A Program Budget Decision (PBD) is prepared by the OSD staff to provide SECDEF with an analysis of the funding and program in each of these segments along with one or more alternative recommendations. When approving a PBD, SECDEF selects the Service position or a staff alternative. The PBD highlights problems with program milestones or funding and permits SECDEF to examine DOD programs prior to meeting with the President and the Director of OMB to resolve final levels of Defense spending.

3.4.20 Major Budget Issues. Major Budget Issues (MBI) are identified by the service secretaries at the conclusion of the PBD review (see 3.4.19) and are discussed by SECDEF and the service secretaries at a special meeting provided for their resolution. Issues are restricted to those which have significant impact on the services.

3.4.21 Program Management Proposal. The Program Management Proposal (PMP) provides early warning of impending cost overruns to top DON management and a means to control system configuration changes which may result in costs not commensurate with added benefits.

SECNAV's PMP instruction requires that every R&D and acquisition program have an approved baseline. A PMP must be submitted to SECNAV when:

- An Operational Requirement (OR) has been approved for a proposed improvement program.
- A change is proposed in an approved baseline which will increase recurring, non-recurring or support costs.

The PMP functions as an agreement among major acquisition program participants. By their signatures

- the SYSCOM Commander certifies that the program is executable for the dollars specified in the proposed change.
- the OPNAV Resource Sponsor certifies commitment to fund the proposed change.

The PMP must be approved by the Navy Acquisition Executive prior to obligating or expending funds for the proposed program change.

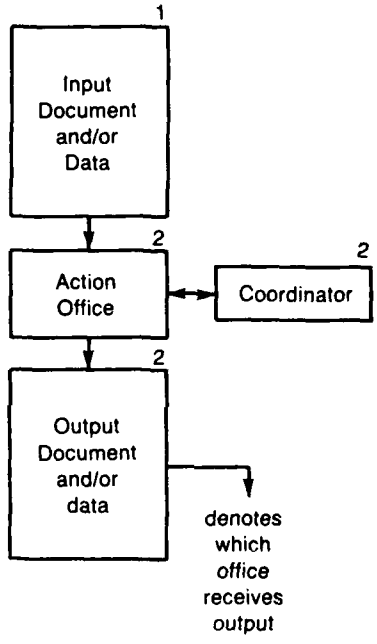
Ref.: SECNAV Instruction 5000.33, NAVCOMPT Instruction 7102.2; DRB Memorandum 88-61; CNO Memorandum POM 92-1

3.5 THE FY 1992-97 PLANNING, PROGRAMMING, AND BUDGETING SYSTEM PROCESS

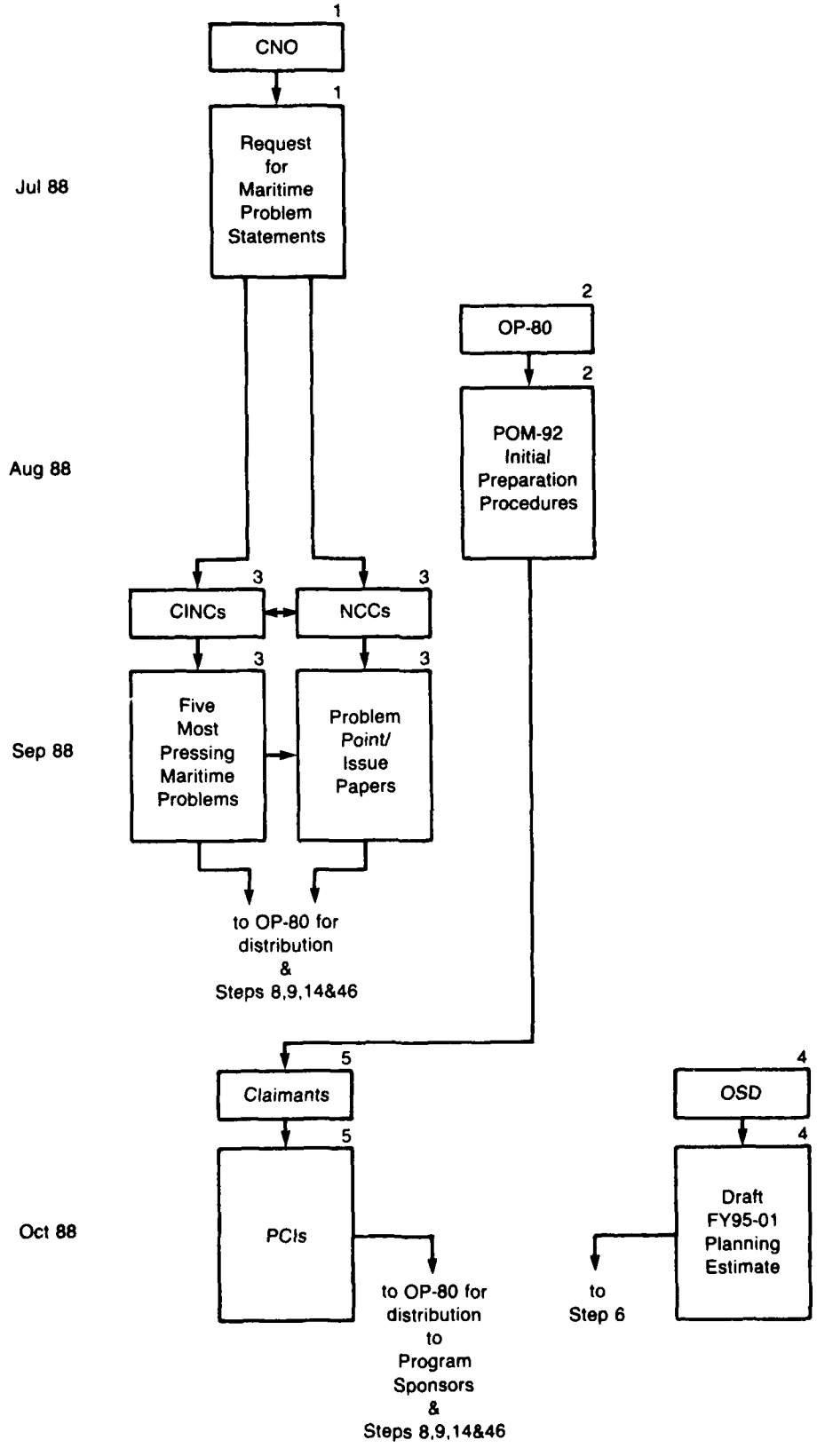
The Department of the Navy's Planning, Programming, and Budgeting System (PPBS) process is graphically portrayed on the following pages in the form of descriptive paragraphs and facing-page flow charts. These paragraphs and

charts describe how the DON's PPBS proceeds step by step, showing the inputs to and the actions required for each step of the process. The descriptions and charts identify the officials and/or groups involved, the documentation used, and the review and approval process. When appropriate, a "NOTE" is added to the end of a paragraph to highlightoptions for the action concerned or to provide some other insight into the action. The flow charts employ symbols as illustrated below.

The charts necessarily show the PPBS process as a progression of major steps from initial high-level strategic decisions and guidance to the final submission by SECDEF of the DOD budget. This should not be interpreted to mean that the PPBS is linear in operation. The programs and budgets for multiple fiscal years are always simultaneously in work at different stages of the cycle. Information flows continuously in both directions, both within and between cycles.



FY 92-97 PROGRAM PLANNING PHASE
(July 1988 to October 1988)



1. In July 1988, the Chief of Naval Operations (CNO) sends a message to the Commanders in Chief (CINCs) requesting their review of the U.S. Maritime Strategy and soliciting their five most pressing maritime problems.

2. On 2 August 1988, OP-80 issues Program Objective Memorandum (POM) 92-1 Memorandum outlining the procedures for the preparation of Program Objectives Memorandum (POM)-92.

3. In September 1988, the CINCs submit their five most pressing maritime problems as preliminary input for the POM-92 appraisal process. Additionally, Navy Component Commanders (NCCs) submit point/issue papers to provide a programmatic focus for Unified Command inputs and inputs of other NCC concerns. These inputs are submitted to OP-80 who disseminates them throughout the Office of the Chief of Naval Operations (OPNAV) for use as a baseline for CINC FY 92-97 concerns.

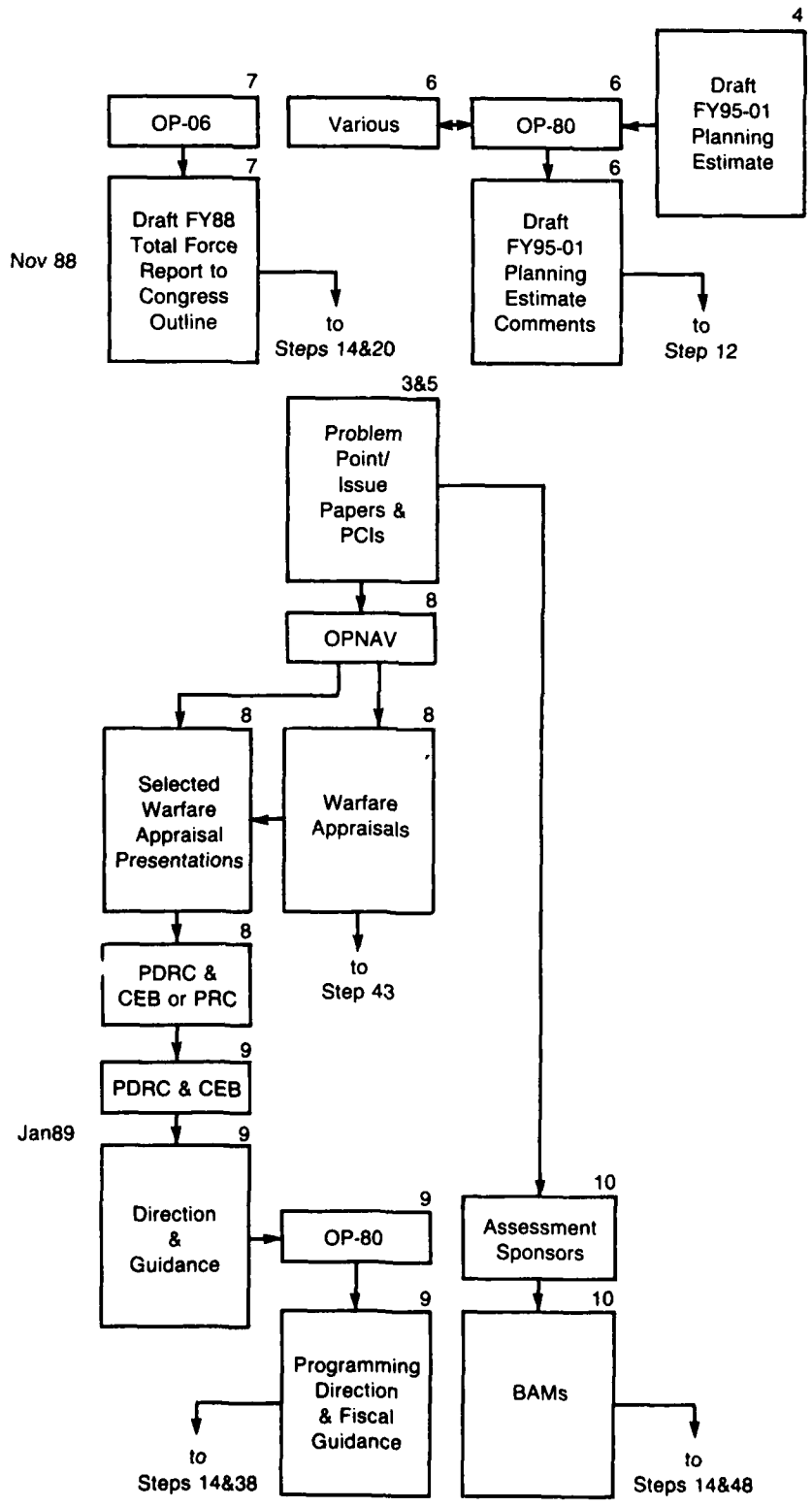
4. On 15 October 1988, the Office of the Secretary of Defense (OSD) issues a Draft FY95-01 Planning Estimate to the Department of Defense (DOD) Components. The Planning Estimate reviews and supplements the post-FY94 "new start" and program/force projections in the DOD Components POMs.

5. On 31 October 1988, Department of the Navy (DON) Claimants submit Preliminary Claimant Inputs (PCIs), including a statement of priorities, major issues and offsets for program adds/increases. The PCIs contain the Mid-POM Review (MPR) proposed adjustments for FY90-91 and requirements for FY 92-97. The PCIs are submitted to OP-80 who distributes them to the cognizant Resource Sponsor within OPNAV for use in the MPR.

   NOTE: The number of issues Claimants may include is not limited, but inputs should focus on major issues of each Resource with the Claimants' priorities indicated.

NOTE: See last page of this chapter for list of abbreviations used in this presentation of the PPBS process.

FY 92-97 PROGRAM PLANNING PHASE
(November 1988 to January 1989)



6. On 15 November 1988, after review of the Draft FY95- 01 Planning Estimate (Step 4), OP-80, in coordination with OP-07 and OP-81, prepares DON comments. At the same time, the other DOD Components submit their individual comments.

7. In November 1988, OP-06 prepares and distributes an outline of the draft FY-88 Total Force Report to Congress.

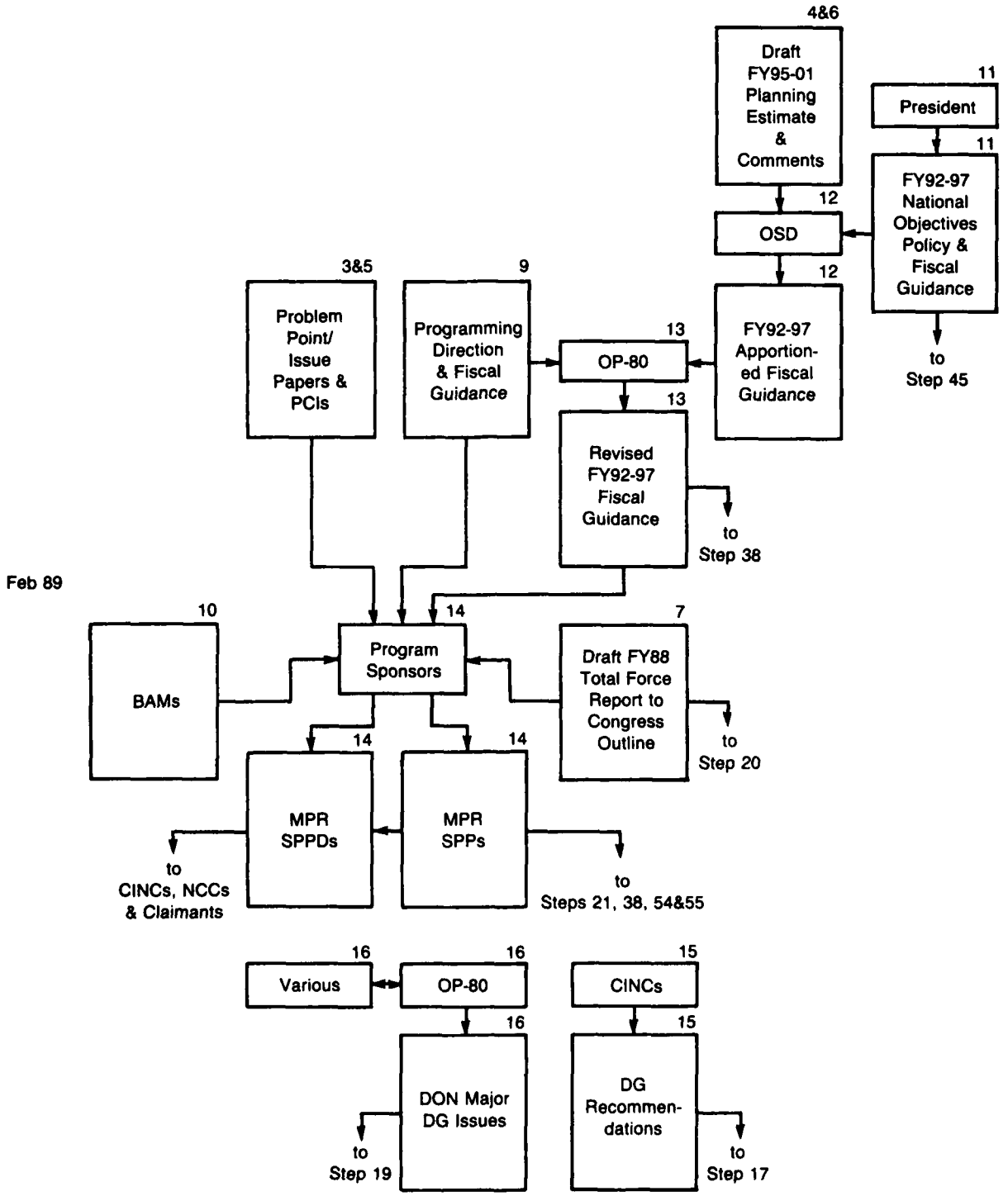
8. In January 1989, based in part on the NCCs' Point/Issue Papers (Step 3) and the Claimants' PCIs, OPNAV completes its series of Warfare Appraisals. Selected Warfare Appraisals are presented to the Program Development Review Committee (PDRC) and either the Chief of Naval Operations Executive Board (CEB) or the Program Review Committee (PRC). Others are submitted in the form of documentation only. The Summary Naval Warfare and the Readiness and Sustainability Appraisals (the last scheduled appraisals) are presented to the PDRC and CEB by OP-07 and OP-81 respectively.

   NOTE: The Summary Warfare Appraisal integrates and prioritizes deficiencies identified during the individual appraisals and recommends improvements to warfare capabilities.

9. In January 1989, as a result of the various appraisals and the PDRC and CEB direction and guidance, OP-80 develops and issues necessary programming direction and initial fiscal guidance to the Resource Sponsors for the MPR Sponsor Program Proposals (SPPs) submission.

10. In January 1989 also, the Baseline Assessment Sponsors develop and submit Baseline Assessment Memoranda (BAMs). The BAMs identify the minimum essential resources required to support the projected force level and approved support structure. Part of the input for the BAMs are the NCCs' Point/Issue Papers and the Claimants' PCIs.

FY 92-97 PROGRAM PLANNING PHASE
(February 1989)



11. On 1 February 1989, the President provides to the OSD a statement of prioritized national security objectives and policies and fiscal guidance for FY92-97.

12. On 5 February 1989, based on the President's statement, the draft FY95-01 Planning Estimate (Step 4) and the DON and other DOD Components comments on the FY 95-01 Planning Estimate (Step 6), the OSD apportions the FY92-97 fiscal guidance to the DOD components.

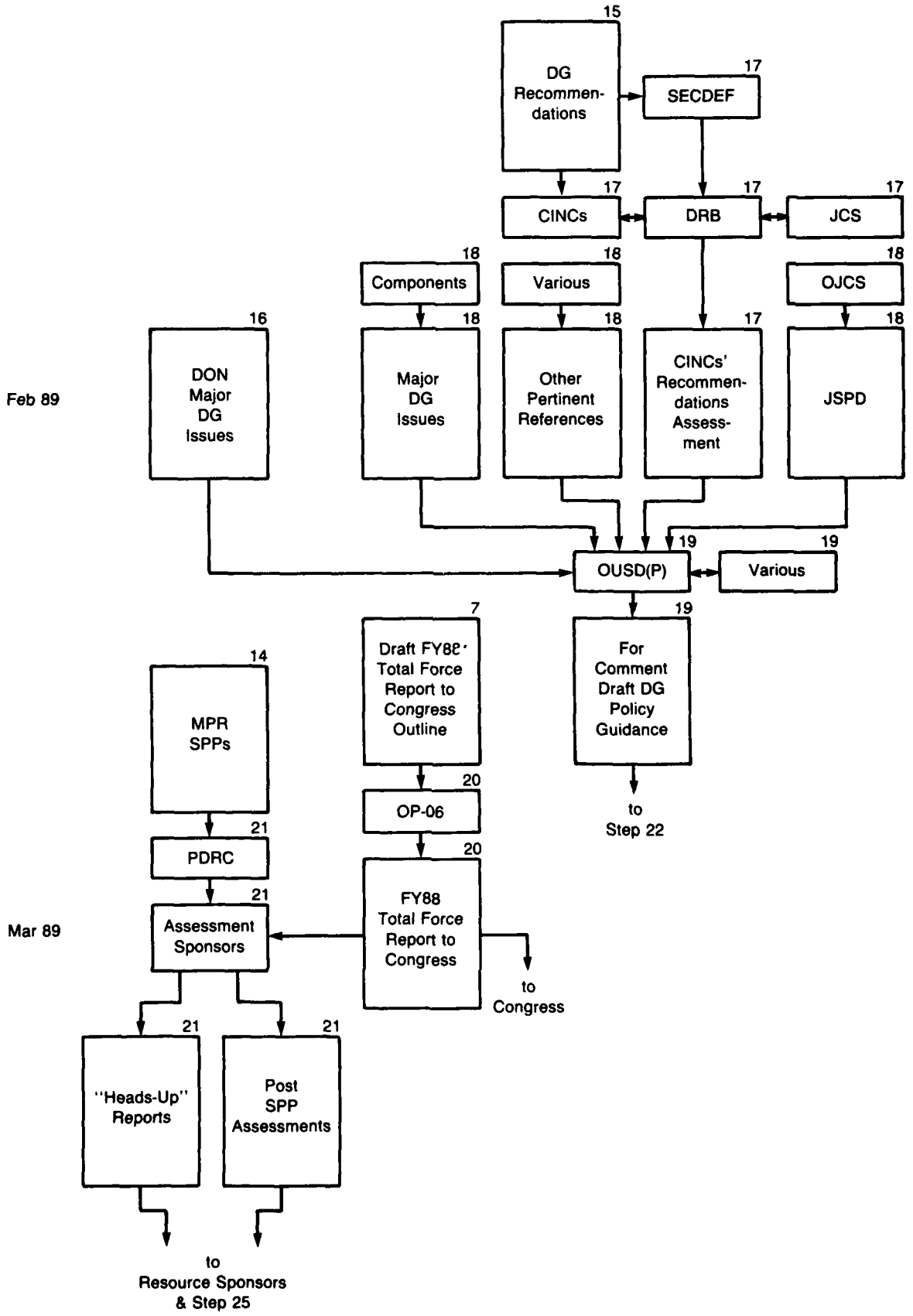
13. In February 1989, based on the initial fiscal guidance (Step 9) and the DOD apportionment, OP-80 issues a revised fiscal guidance for FY92-97.

14. In February 1989, based on the Problem Point/Issue Papers (Step 3), the PCIs (Step 5), the draft FY88 Total Force Report to Congress outline (Step 7), the programming direction (Step 9) and the revised fiscal guidance (Step 13), Resource Sponsors prepare MPR SPPs as well as SPP Documents (SPPDs) which are supplied to the CINCs, NCCs, and Claimants.

15. Also on 1 February 1989, the OSD Planning Phase activity begins with the CINCs preparing their personal recommendations for major changes in the previous Defense Guidance (DG).

16. In February 1989, OP-80, in coordination with various elements of the DON, prepares a listing of the DON Major DG Issues.

FY 92-97 PROGRAM PLANNING PHASE
(February and March 1989)



17. In February 1989, the CINCs DG recommendations (Step 15) are furnished to the Secretary of Defense (SECDEF). After submittal, the Joint Chiefs of Staff (JCS) and the CINCs meet with the Defense Resources Board (DRB) to review and assess their recommendations.

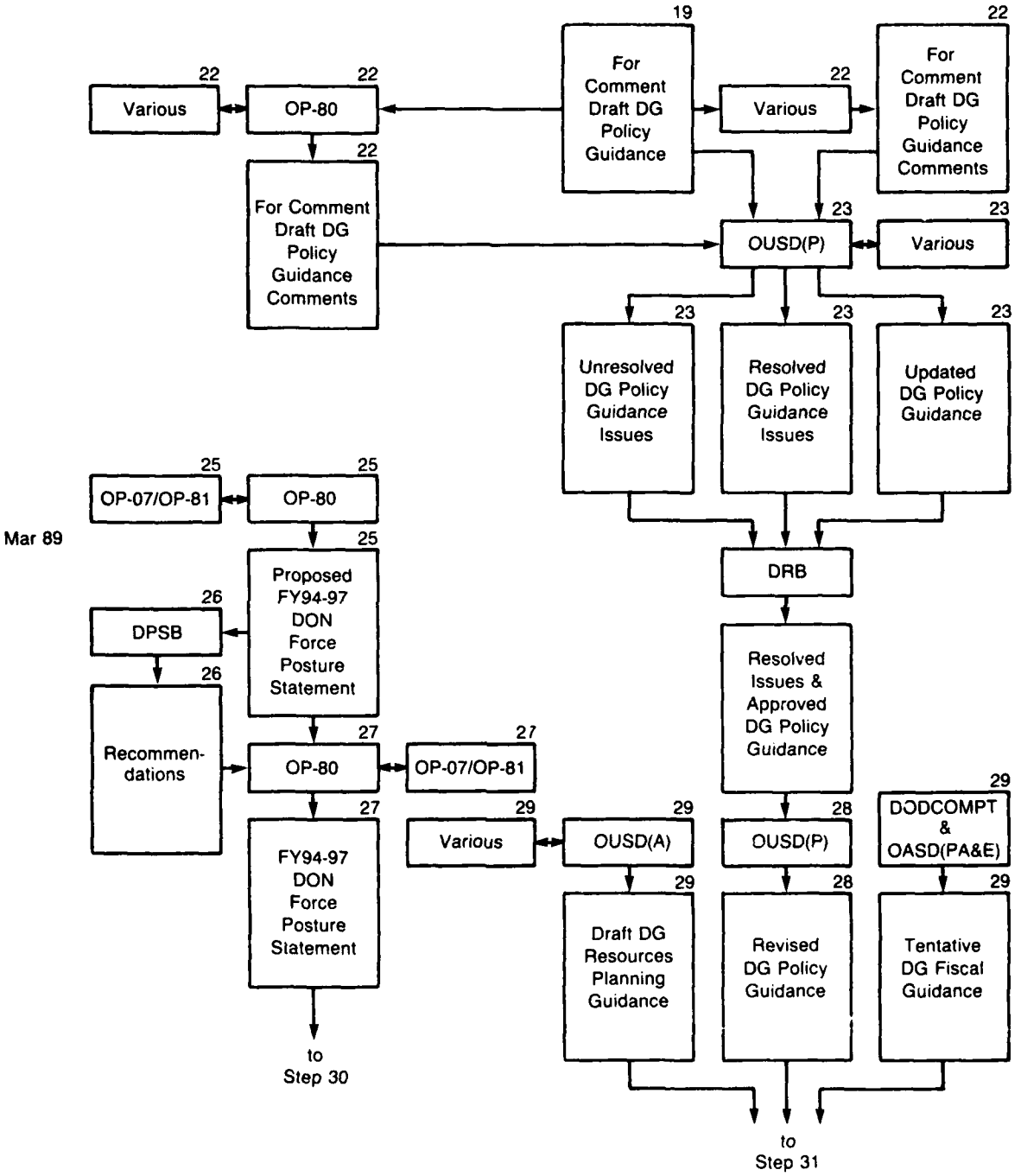
18. In February 1989, various organizations provide the SECDEF with their major DG issues for use in the DG development process. These include: the Joint Strategic Planning Document (JSPD) from the Organization of the JCS (OJCS); DON major DG issues (Step 16) and other DOD Components major DG issues which they wish to have considered during the development of the DG; and other references pertinent to the development of Policy, Strategy, and Force Planning sections of the DG.

19. In February 1989, based on the DRB assessment of the CINCs' recommendations and the other key inputs, the Office of the Under Secretary of Defense, Policy (OUSD(P)) develops, in coordination with the staffs of the DOD Components, the OJCS and the OSD, a "For Comment" draft of the Policy Guidance section of the Threat Assessment, Policy, Strategy, and Force Planning part of the DG.

20. In March 1989, OP-06 develops and submits the FY88 Total Force Report to the Congress based on the earlier developed draft outline.

21. In March 1989, after the PDRC has been briefed on the MPR SPPs (Step 14), the Assessment sponsors provide "Heads-Up" Reports on major issues and a week later, written Post-SPP Program Assessments.

FY 92-97 PROGRAM PLANNING PHASE
(March 1989)



22. In March 1989, the OUSD(P) provides the For Comment Draft Policy Guidance section of the DG (Step 19) to the DON and other DOD Components, the CINCs, the staff of the National Security Council (NSC), the Department of State, and the Office of Management and Budget (OMB) for review and comments. OP- 80 in coordination with various elements of OPNAV develops the DON comments.

23. In March 1989, the various comments are submitted to the OUSD(P). Where possible, issues raised by the comments are resolved between the various staffs and incorporated in an updated Policy Guidance section of the DG. Other issues are identified as requiring DRB review and resolution.

24. In March 1989, the DRB meets to resolve the remaining issues and to review and approve and/or modify the updated Policy Guidance section of the DG.

25. In March 1989, OP-80, in coordination with OP-07 and OP-81, prepares the proposed DON Force Posture Statement for FY 90-97 which consists of forces, readiness, sustainability, and major-system modernization which is proposed at the DON allocated fiscal level.

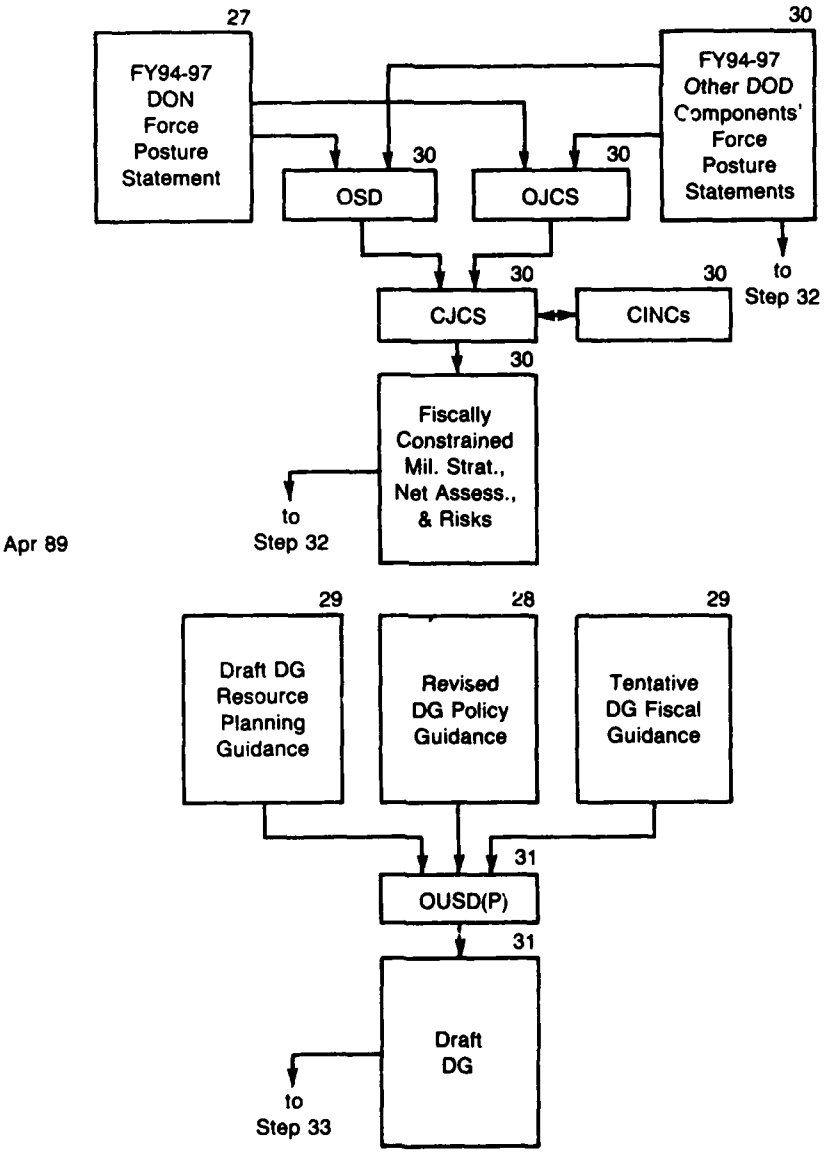
26. In March 1989, the proposed DON Force Posture Statement is briefed to the DON Program Strategy Board (DPSB) which provides its recommendations.

27. In March 1989, OP-80 with OP-07 and OP-81 revises the Force Posture Statement based on DPSB recommendations.

28. In March 1989, the OUSD(P) revises, as necessary, the updated Policy Guidance section of the DG.

29. In March 1989, the Office of the Under Secretary of Defense (Acquisition) (OUSD(A)) in coordination with the Office of the Comptroller of the Department of Defense (DOD COMPT) the Office of the Assistant Secretary of Defense, Program Analysis and Evaluation (OASD(PA&E)) and the staffs of the DOD Components, the OJCS, and the OSD; prepare a draft DG Resources Planning Guidance. At the same time, the DOD COMPT and the OASD(PA&E) prepare a Tentative DG Fiscal Guidance.

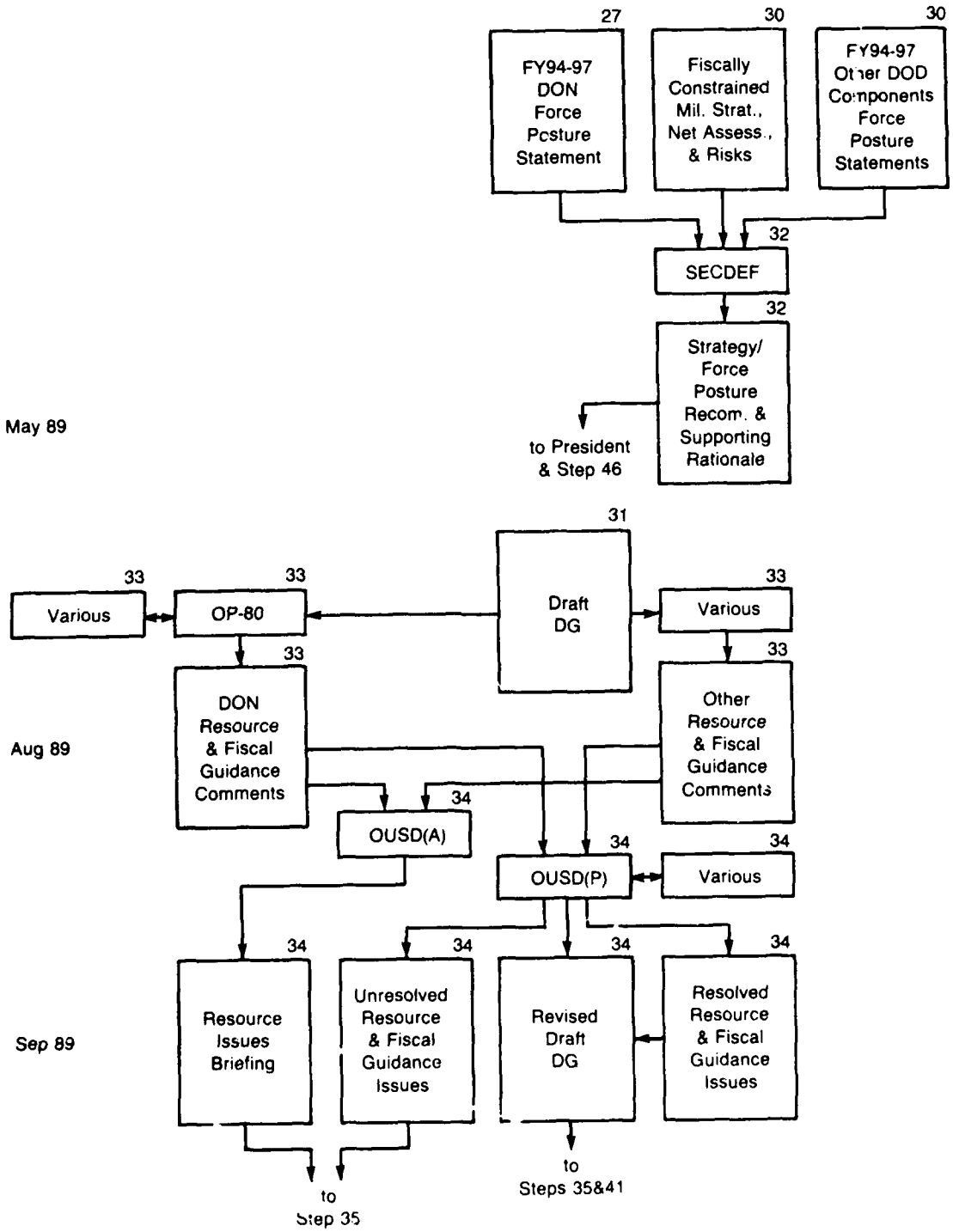
FY 92-97 PROGRAM PLANNING PHASE
(April 1989)



30. On 1 April 1989, the DON Force Posture Statement (Step (27) and those of the other DOD Components are provided to the OSD and Office of the Joint Chiefs of Staff (OJCS). The Chairman of the Joint Chiefs of Staff (CJCS), in conjunction with the CINCs, develops: a fiscally constrained military strategy, a net assessment, and a summary of the resulting risks.

31. In April 1989, the draft Resource Planning Guidance and the Tentative Fiscal Guidance (Step 29) are forwarded to the OUSD(P). Based on these documents and the revised Policy Guidance section (Step 28) of the DG, the OUSD(P) prepares the draft DG.

FY.92-97 PROGRAM PLANNING PHASE
(May to September 1989)

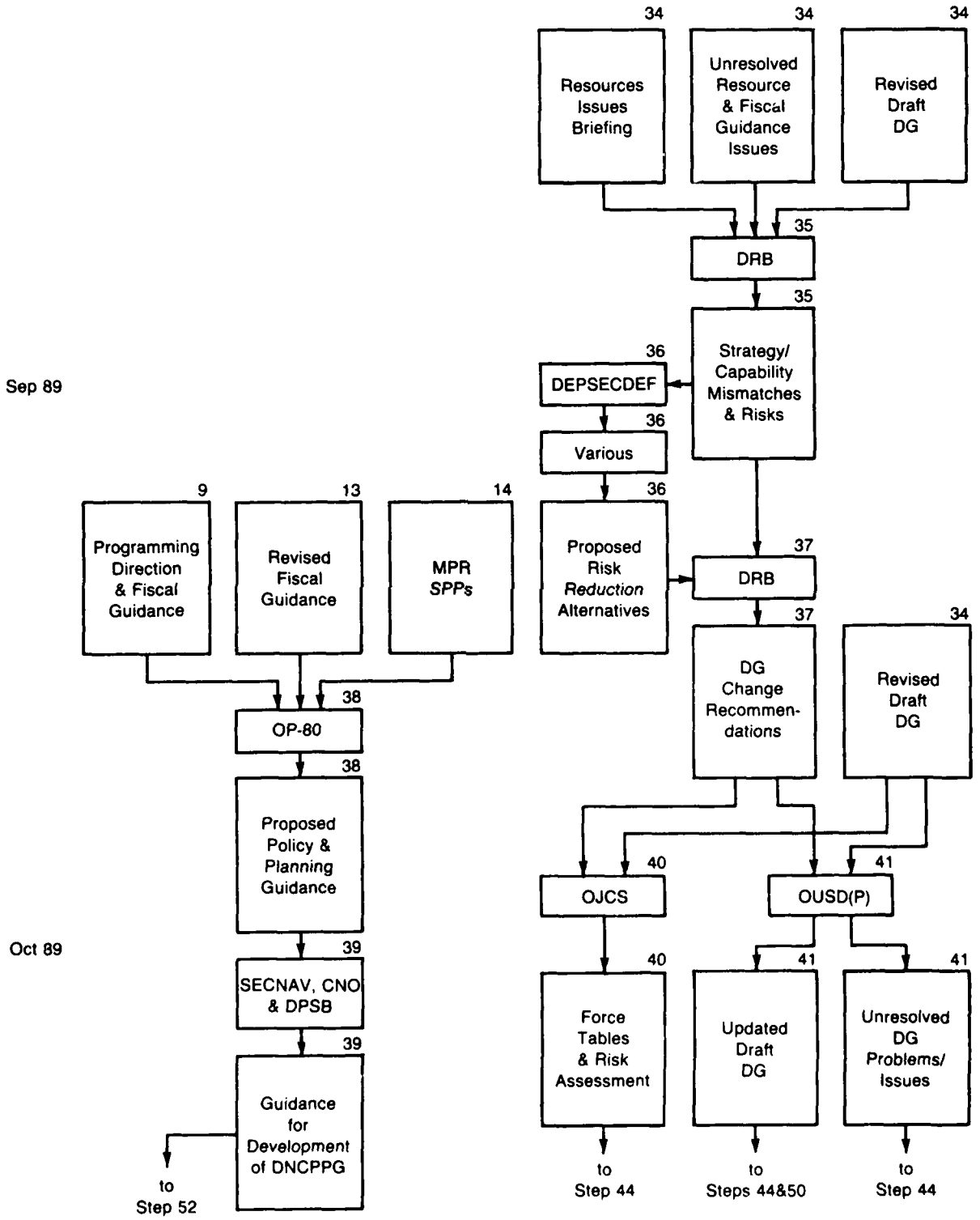


32. On 1 May 1989, the CJCS assessment (Step 30) is submitted to the SECDEF who uses it along with the DON's and other DOD Components' FY90-97 Force Posture Statements (Step 27) to form the basis for a strategy/force posture recommendation and supporting rationale and submits it to the President.

33. On 1 August 1989, the Draft DG (Step 31) is provided to the DOD Components, the CINCs, the NSC staff, the Department of State and the OMB for review and comment on the Resources and Fiscal Guidance sections of the draft DG.

34. By September 1989, the various comments are provided to the OUSD-(P). Again, where possible, issues raised by the comments are resolved between the various staffs and the draft DG revised as necessary. Issues requiring DRB review and resolution are identified. At the same time, the OUSD(A) prepares briefings on the resources issues of the draft DG.

FY 92-97 PROGRAM PLANNING PHASE
(September and October 1989)



35. In September 1989, the DRB meets to review the revised draft DG and the various comments on the draft DG and to resolve the remaining issues on the draft DG. The DRB is also briefed on the resource implications and constraints of the revised draft DG. This review and briefing provide an early insight into areas of strategic capability mismatches and risks.

36. In September/October 1989, as a result of the DRB review and briefing, the Secretary of the Navy (SECNAV) and other Service Secretaries, OSD members and the JCS, working with the DRB members, are tasked, as necessary, by the Deputy SECDEF (DEPSEC- DEF), to develop proposed alternative solutions to reduce the identified risks.

37. In October 1989, these proposed solutions are presented to the DRB. As a result of this review, the DRB develops its recommendations for changes to the revised draft DG.

    NOTE: In some cases, the DRB may recommend that the SECDEF request an increase in resources to reduce the mismatch and risks.

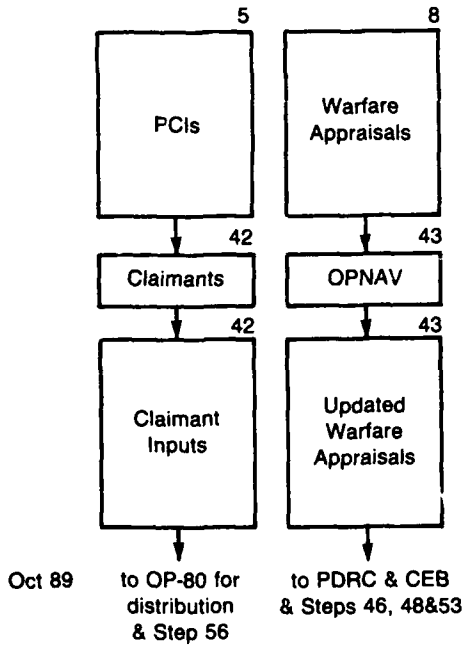
38. In October 1989, based on the earlier developed programming direction and fiscal guidance (Steps 9 & 13) and the MPR SPPs (Step 14), OP-80 develops a proposed policy and programming guidance.

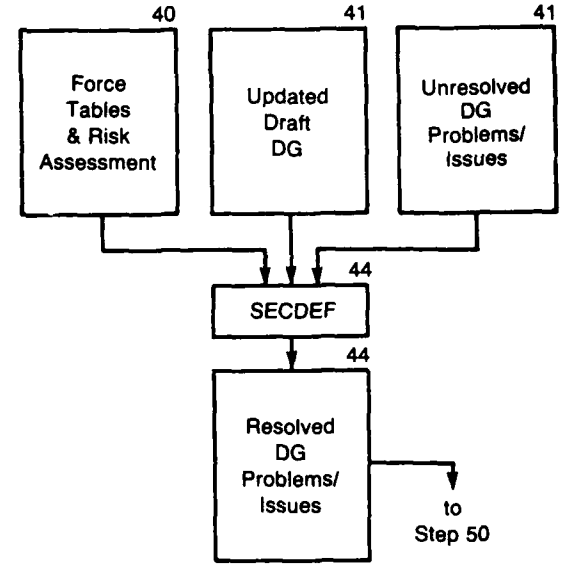
39. In October 1989, OP-80 presents the proposed policy and planning guidance for the development of the Department of the Navy Consolidated Planning and Programming Guidance (DNCPPG) to the SECNAV, CNO and DPSB for review and approval.

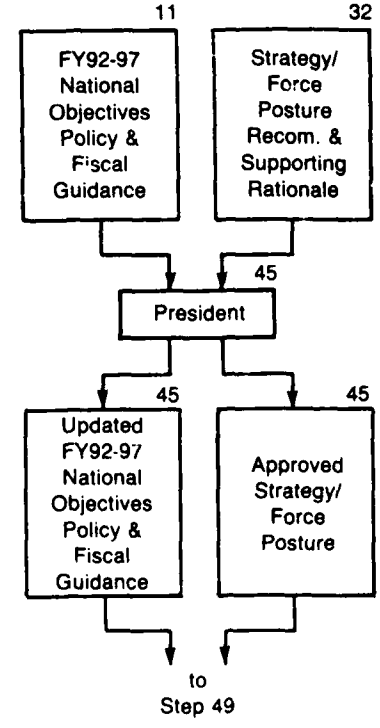
40. In October 1989, the OJCS, based on the revised draft DG (Step 34) and the DRB recommendations, prepares tables of expected major forces which it estimates will minimize the risks involved, and an assessment of the risks associated with their ability to carry out the strategy contained in the DRB recommendations.

41. In October 1989, the DRB decisions on major issues, that result in changes in guidance emphasis/force mixes, are reflected, by the OUSD(P), in an updated draft DG. At this time, the OUSD(P) also prepares a list of any unresolved problems and/or issues.

FY 92-97 PROGRAM PLANNING PHASE
(October 1989)







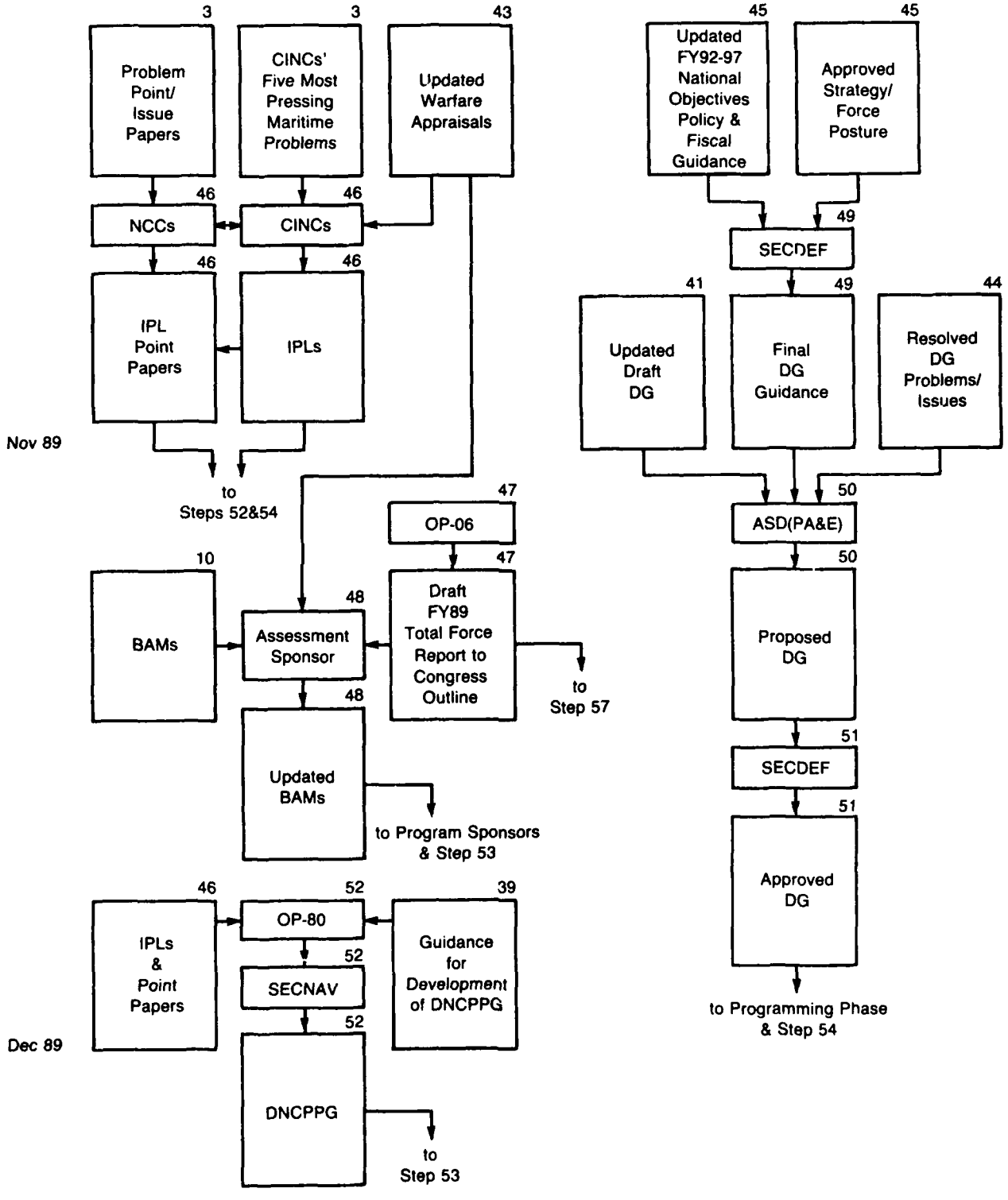
42. In October 1989, the various Claimants update their PCIs (Step 5) and submit Claimant Inputs including a statement of priorities, 5 major issues for each Program Sponsor, and offsets for program add/increases. The Claimant Inputs are submitted to OP-80 for distribution.

43. In October 1989, based on the earlier appraisals (Step 8), OPNAV updates selected appraisals including the Summary Warfare and Readiness and Sustainability Appraisals, and presents them to the PDRC and CEB.

44. In October 1989, the updated draft DG (Step 41), the associated OJCS force tables and risk assessment, and any unresolved problems and/or issues (Steps 40 & 41) are reviewed and resolved by the SECDEF.

45. Not later than 30 October 1989, the President either endorses the SECDEF's strategy/force posture (Step 32) or directs changes and provides corresponding adjustments of his previously stated national security objectives and/or fiscal guidance (Step 11).

FY 92-97 PROGRAM PLANNING PHASE
(November and December 1989)



46. In November 1989, based on the earlier CINCs' problem submittal (Step 3), the NCCs' point/issue papers (Step 3) and the updated warfare appraisals (Step 43), the CINCs develop Integrated Priority Lists (IPLs). NCCs develop point papers to provide programmatic focus for the CINCs' IPLs and to permit input of other Component Commanders' concerns.

47. In November 1989, OP-06 prepares and distributes an outline of the draft FY-89 Total Force Report to Congress.

48. In November 1989, based on the BAMs (Step 10), the draft FY89 Total Force Report to the Congress and the updated warfare appraisals, the Baseline Assessment Sponsors prepare updated BAMs and provide them to the cognizant Resource Sponsors.

49. In November 1989, based on the President's Updated FY92-97 national objectives, policy and fiscal guidance and his approved strategy/force posture (Step 45), the SECDEF provides his final DG guidance.

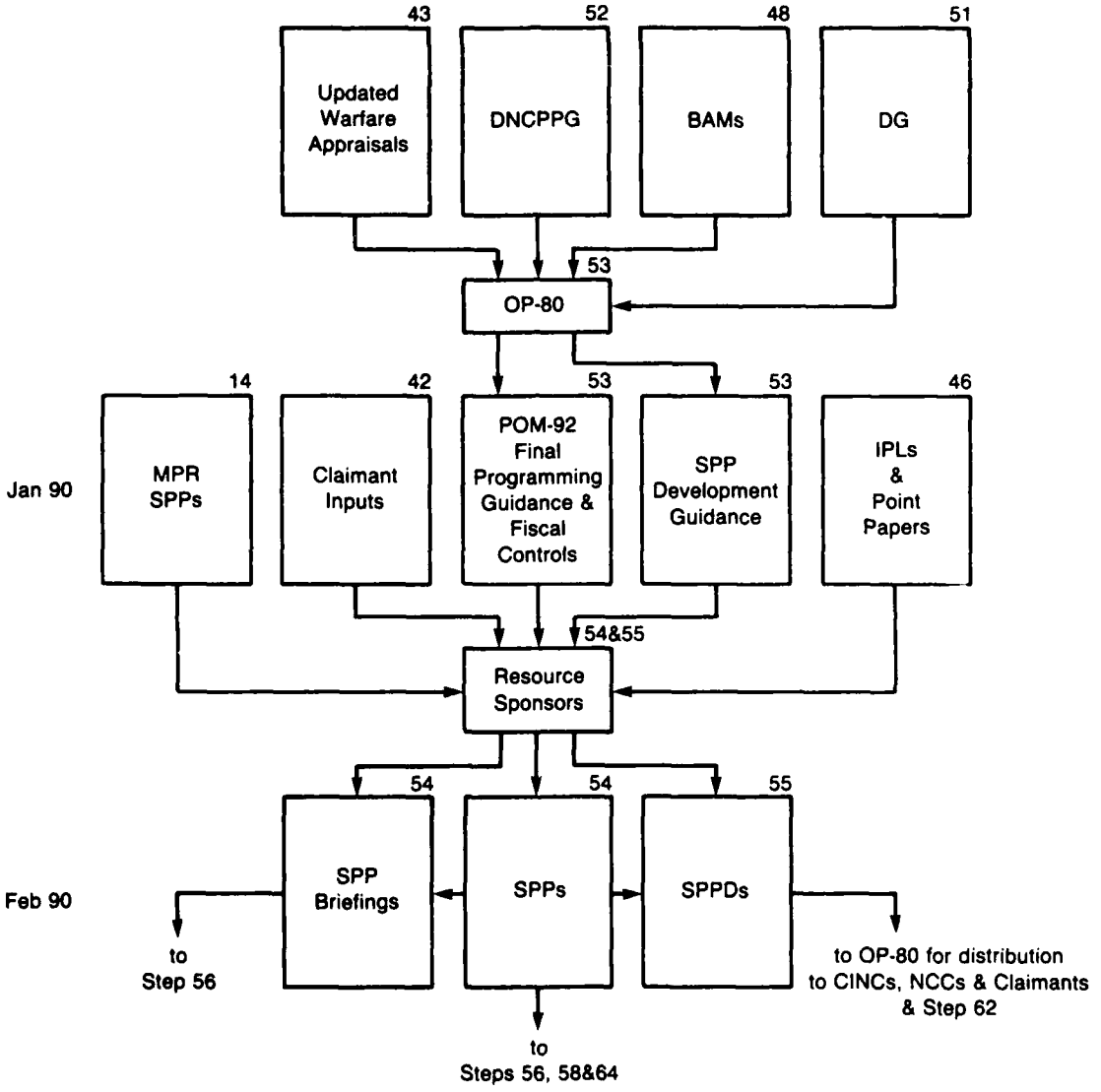
50. In November 1989, based on the updated draft DG (Step 41), the resolved DG problems/issues (Step 44) and the final SECDEF guidance, OASD (PA&E) prepares the proposed DG.

51. NLT 30 November 1989, the proposed DG is presented to the SECDEF for review and approval and issued to the DOD Components.

52. In December 1989, based on the guidance for the development of the DNCPPG (Step 39) and the IPLs and IPL Point Papers (Step 46), OP-80 develops the DNCPPG after which it is submitted to the SECNAV for review, approval, and issuance.

NOTE: See last page of this chapter for list of abbreviations used in this presentation of the PPBS process.

FY 92-97 PROGRAMMING PHASE
(January and February 1990)

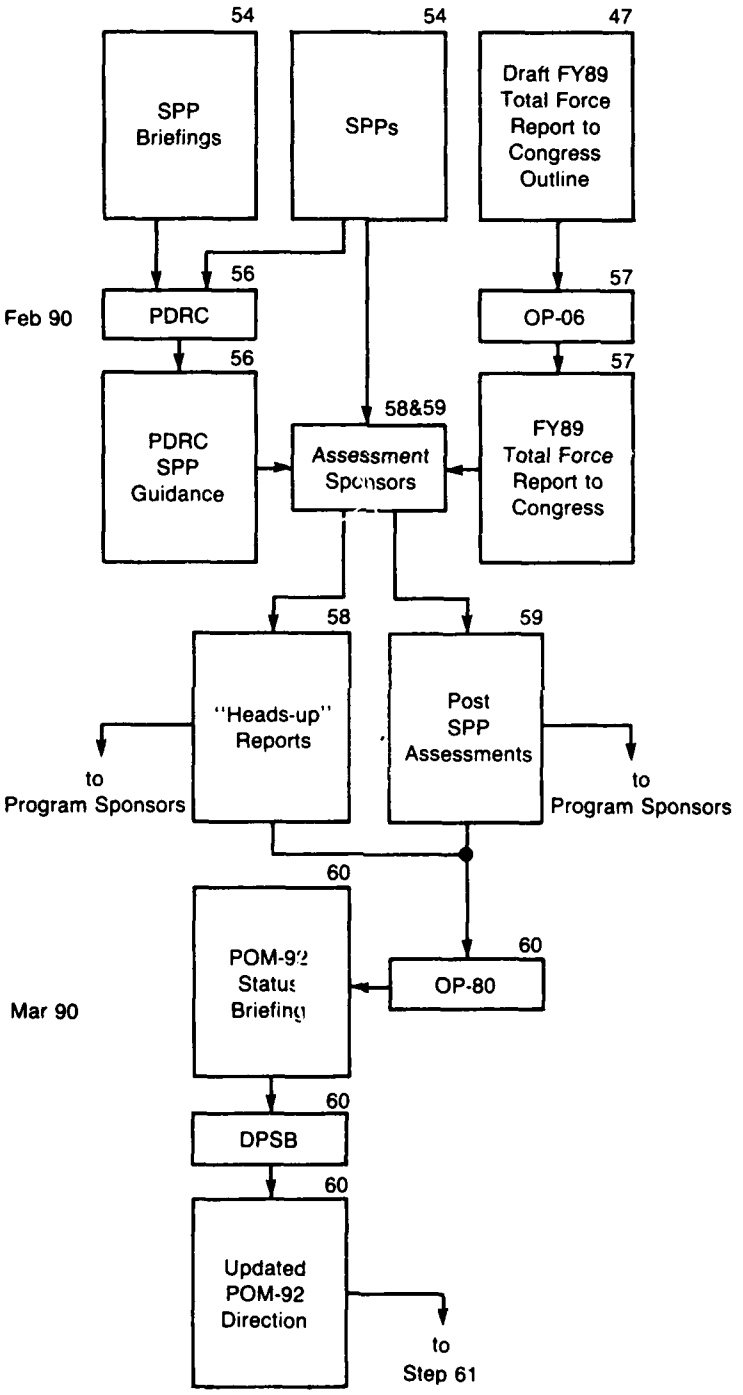


53. In January 1990, based in part on the DG (Step 51), the DNCPPG, updated warfare appraisals (Step 43), and the updated BAMs (Step 48), OP-80 develops and publishes POM-92 final programming guidance, fiscal controls, and SPP development guidance to the Program Sponsors.

54. In February 1990, the Resource Sponsors prepare and submit their SPPs based on the OP-80 published POM-92 final programming guidance, fiscal controls, and SPP development guidance, the earlier developed MPR SPPs (Step 14), the Claimant Inputs (Step 42), and the CINCs' IPLs and NCCs' Point Paper (Step 46). The Program Sponsors also prepare briefings on their SPPs.

55. In February 1990, the Resource Sponsors also prepare and submit their updated SPPDs containing responses to the CINCs IPLs and the NCCs Point Papers and the top five issues from each Claimant contained in the Claimant Inputs. The SPPDs are submitted to OP-80 who distributes them to the CINCs, NCCs and Claimants.

FY 92-97 PROGRAMMING PHASE
(February and March 1990)



56. In February 1990, the various Resource Sponsors provide detailed briefings to the PDRC on their SPPs.

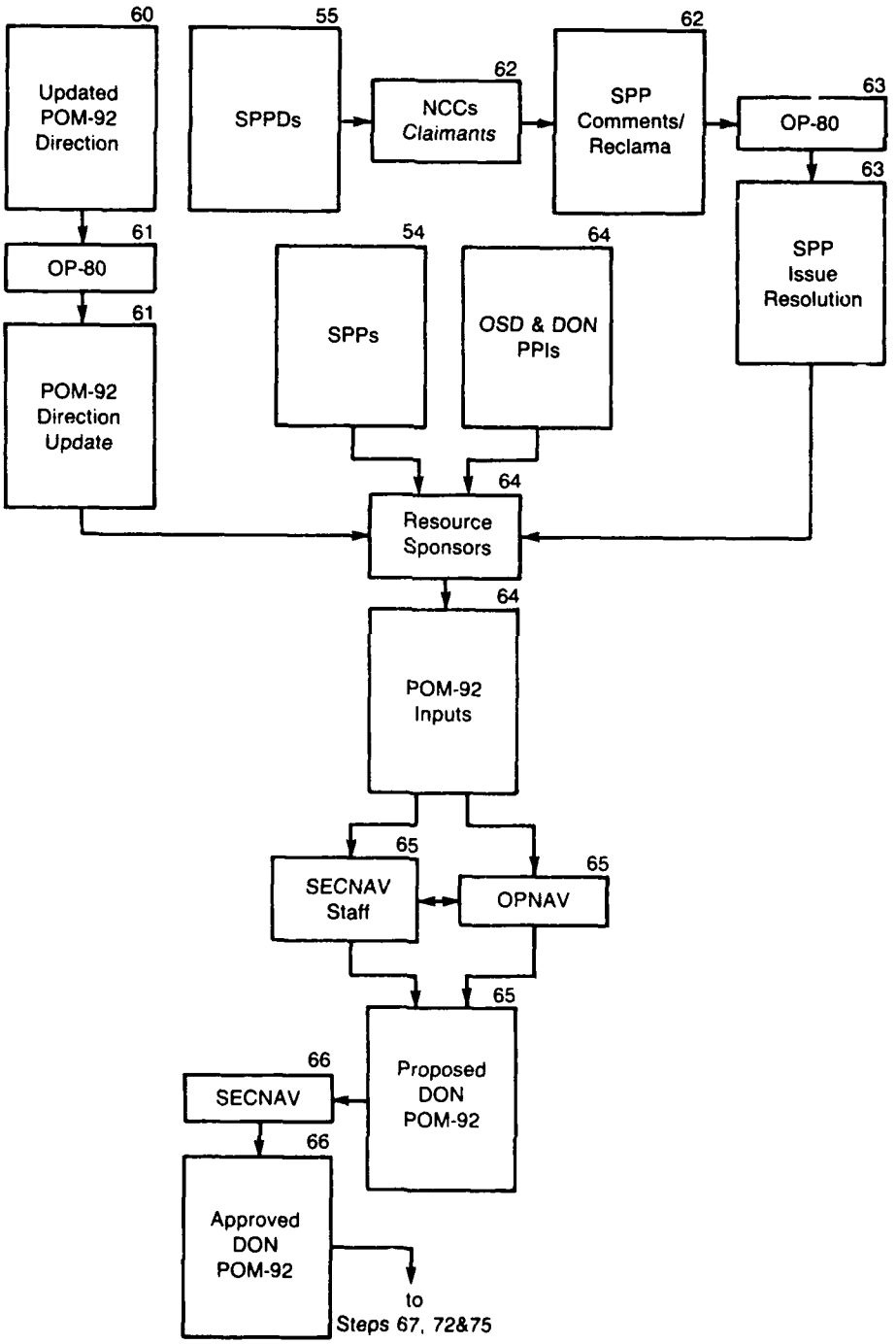
57. In March 1990, OP-06 prepares and submits the FY89 Total Force Report to the Congress based on the earlier draft outline (Step 47).

58. In March 1990, after the PDRC has been briefed and provided its guidance, the Baseline Assessment Sponsors prepare their "Heads-Up" Reports which are provided to the Program Sponsors.

59. In March 1990, at the same time, the Baseline Assessment Sponsors review the SPPs (Step 54) and, based in part on the FY89 Total Force Report to the Congress, prepare Post-SPP Assessments.

60. In March 1990, based in part on the status of POM-92 and the "HeadsUp" Reports and the Post-SPP Assessments, OP- 80 briefs the DPSB on the status of the POM-92 and obtains the DPSB's updated POM-92 direction.

FY 92-97 PROGRAMMING PHASE
(March 1990)



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61. In March 1990, based on the DPSB's updated POM-92 direction (Step 60), OP-80 prepares and issues the POM-92 Direction up-date.

62. In March 1990, after review of the SPPDs (Step 55), the various NCCs and Claimants prepare their SPP comments/reclama.

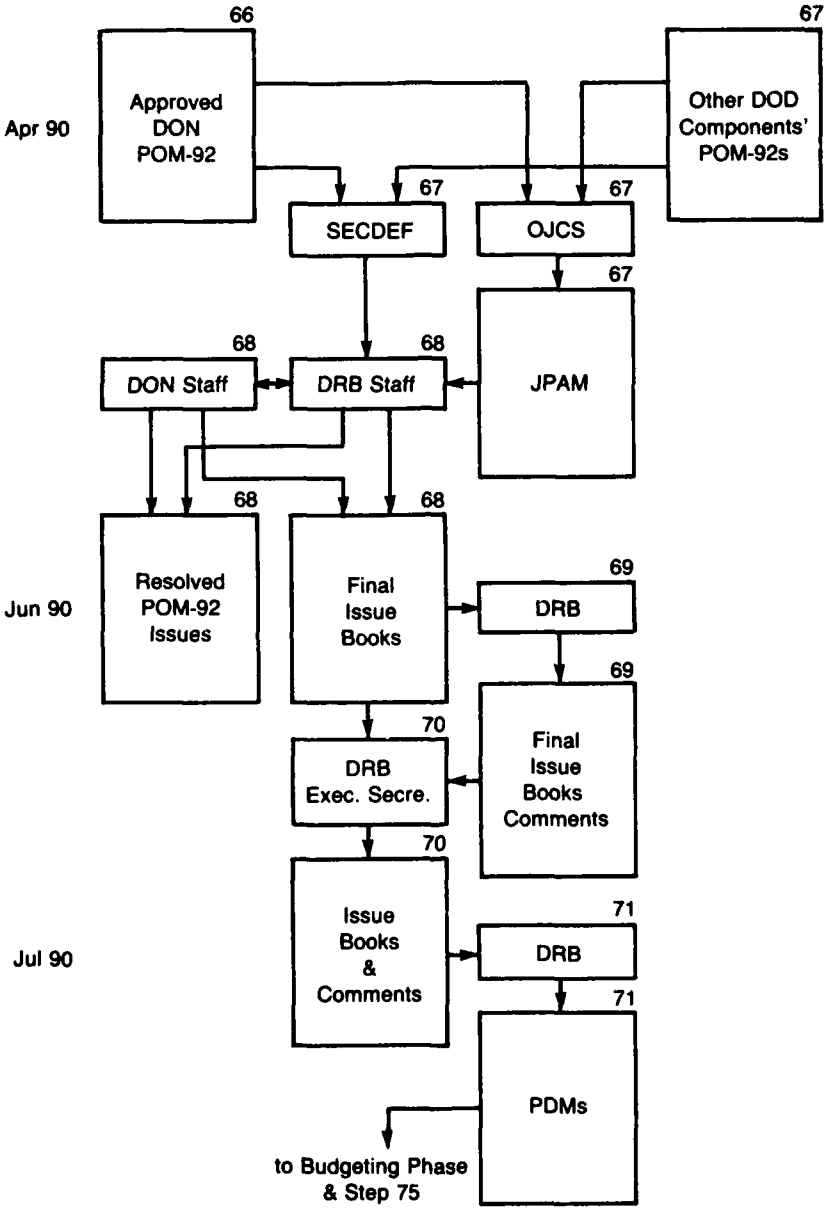
63. In March 1990, the NCCs' and Claimants' SPP comments/reclama are submitted to OP-80 which resolves any final issues remaining.

64. In March 1990, the Resource Sponsors document their part of POM-92, based in part on the SPPs (Step 54) and in accordance with the POM Preparation Instructions (PPIs) issued by OSD and the DON.

65. In March 1990, the Resource Sponsors inputs are used by the SECNAV staff and OPNAV to prepare the proposed Navy POM.

66. In March 1990, the proposed Navy POM is submitted to the SECNAV for review and approval, after which it is submitted to OSD.

FY 92-97 PROGRAMMING PHASE
(April to July 1990)



67. On 1 April 1990, copies of the DON POM-92 (Step 66) and the POM-92s of the other DOD Components are provided to the SECDEF, the DRB members, and the OJCS. Based on its review of the POMs, the OJCS prepares its Joint Program Assessment Memorandum (JPAM).

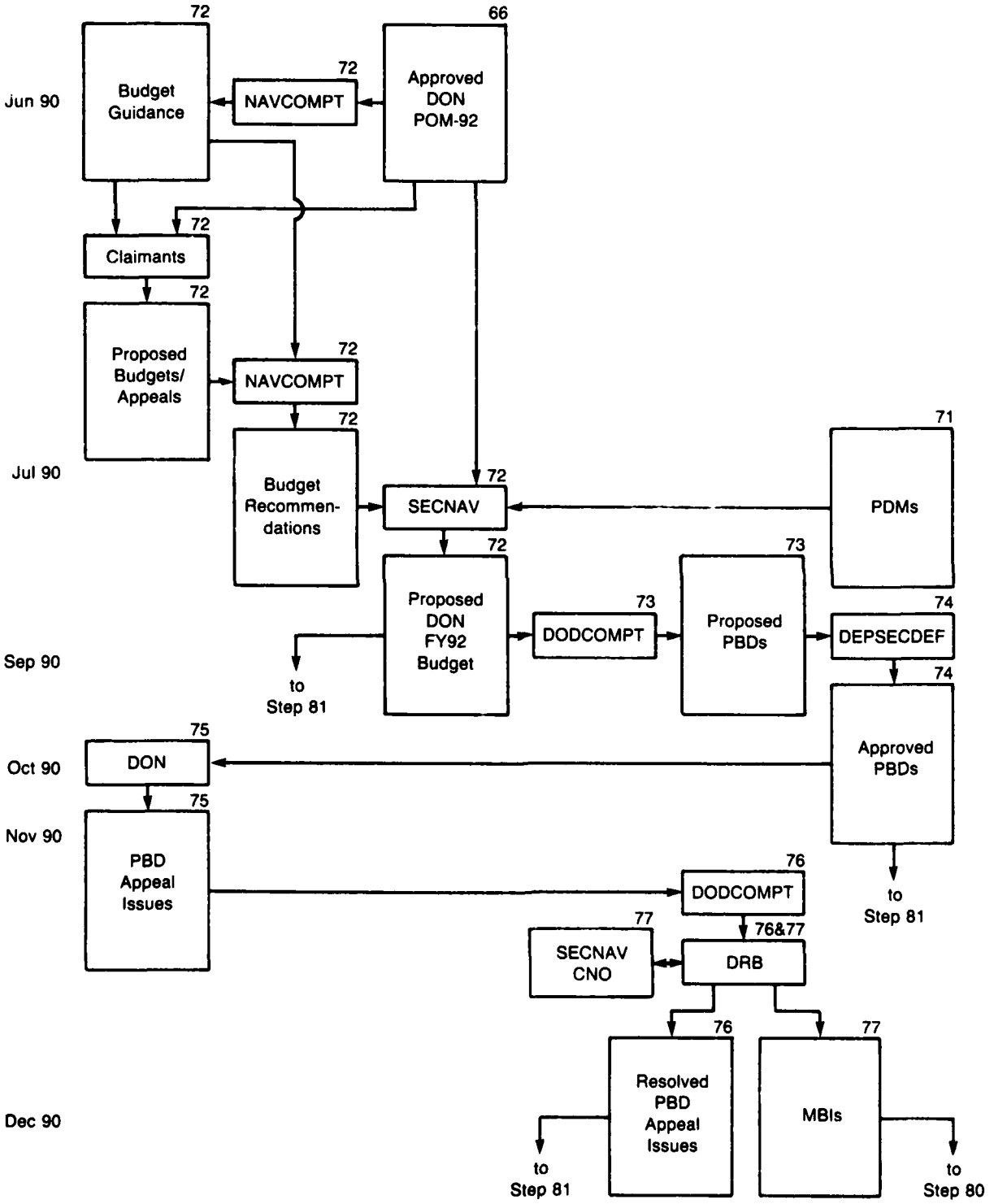
68. In June 1990, the JPAM is forwarded to the DRB members. The DRB members' staffs, after review of the POMs and the JPAM, identify any issues raised by this review. As many issues as possible are resolved between the DRB members' staffs and the DOD Components and the OJCS. Issues which cannot be resolved are documented as Issue Papers for insertion into the Final Issues Book.

69. In June 1990, copies of the Final Issues Books are provided to the DRB members for review and brief executive-level comments.

70. In July 1990, the DRB comments are provided to the DRB Executive Secretary for Assembly into Issue Books.

71. In July 1990, the Issue Books and comments are provided to the DRB for review. After review, the DRB determines its position on the POMs. These positions are recorded in a set of Program Decision Memoranda (PDMs), one PDM for each POM.

FY 92-97 BUDGETING PHASE
(June to December 1990)



72. In June and July 1990, based on the DON POM-92 (Step 66) and guidance from the Comptroller of the Navy (NAVCOMPT), the Claimants prepare and submit their proposed budgets to the NAVCOMPT. Based on these submittals and any late appeal, the NAVCOMPT prepares his recommendations. The POM, PDM (Step 71), proposed Claimant budgets, and the NAVCOMPT recommendations and resultant SECNAV decisions form the basis for the Navy budget.

73. In September 1990, the proposed budgets of the DON and the other DOD Components are submitted to the DOD COMPT. After review, the DOD COMPT coordinates determination of OSD positions on the proposed budgets. These positions are recorded in a set of proposed Program Budget Decisions (PBDs).

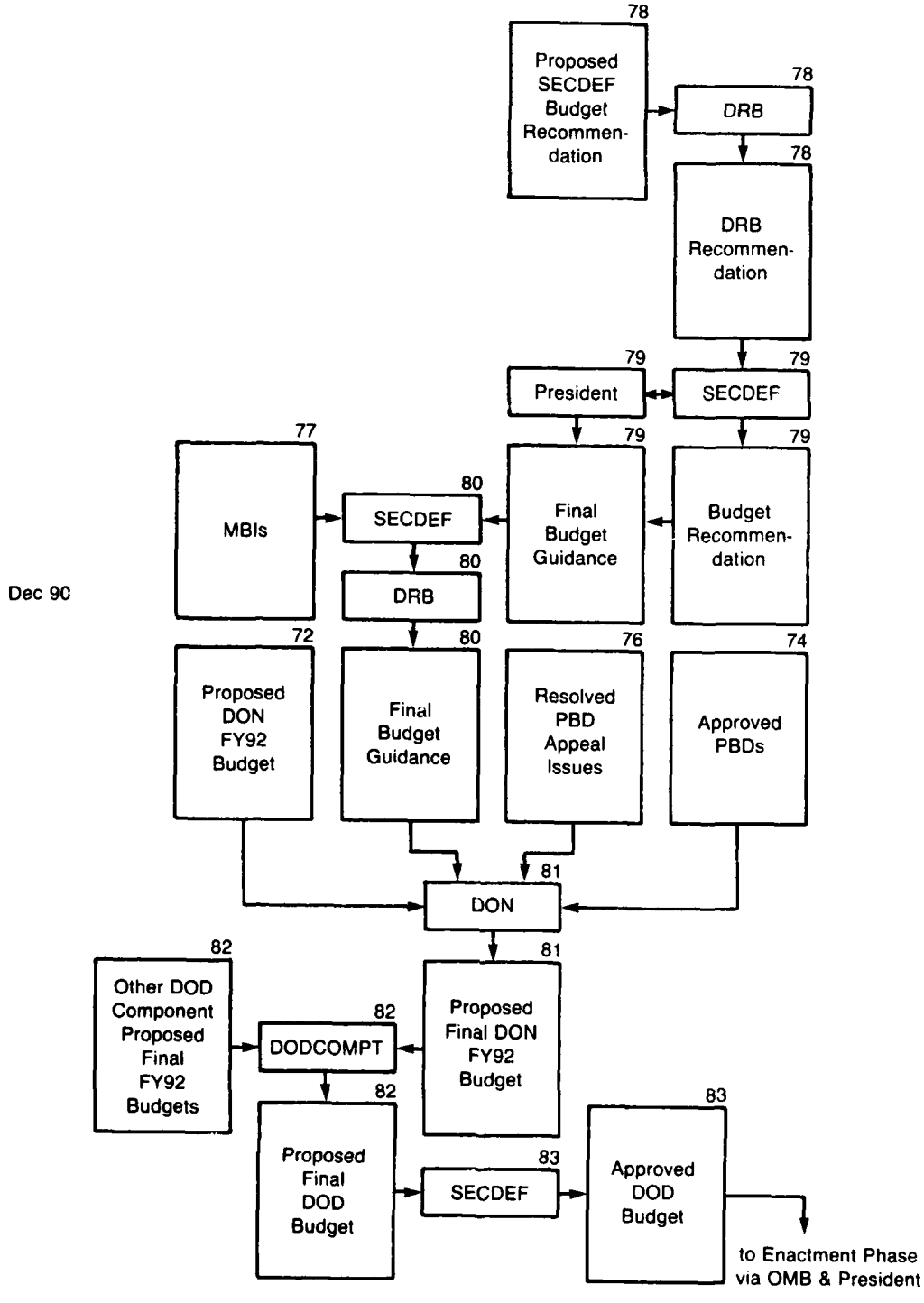
74. In October and November 1990, the Proposed PBDs are submitted to the DEP- SECDEF for review and approval.

75. In October, November and December 1990, copies of the PBDs are also supplied to the DON and other DOD Components. After review, the DON and other DOD Components prepare, for items they are in disagreement with, appeal issues.

76. In November 1990, the DON's and other DOD Components' appeal issues are presented to the DRB for review and resolution.

77. In mid-December 1990, the SECNAV and CNO, and the other DOD Component Secretaries and Service Chiefs meet with the DRB to resolve Major Budget Issues (MBIs) still outstanding and of sufficient importance to be brought directly to the attention of the SECDEF.

FY 92-97 BUDGETING PHASE
(December 1990 to January 1991)



78. In early December 1990, the DRB meets to review the SECDEF's proposed budget recommendations which he plans to present to the President. Based on that review, the DRB prepares its recommendations to the SECDEF.

79. In mid-December 1990, the DRB's recommendations are submitted to the SECDEF. The SECDEF, in turn, makes his recommendations to the President who, after review, provides the SECDEF with his final budget guidance.

80. In mid-December 1990, based on the approved PBDs, the DOD components' PBD appeals and MBIs (Step 77) resolutions and the President's final budget guidance provided to the SECDEF, the DRB meets to establish the final budget guidance for the DON and other DOD Components, which is transmitted by the final PBDs.

81. In late December 1990, the DON and other DOD Components prepare their proposed Final Budgets based on the final budget guidance, their earlier submitted proposed budgets (Step 72), the approved PBDs (Step 74), and their PBD appeal issue resolutions (Step 76).

82. In late December 1990, the DON and other DOD Components' proposed Final Budgets are forwarded to the Office of the DOD COMPT which combines them into a single proposed DOD Budget.

83. In late December/early January 1991, the proposed Final DOD Budget is submitted to the SECDEF for review and approval. The DOD Budget is then forwarded to OMB where it is incorporated into a single National Budget, approved by the President, and submitted to the Congress, in January, for enactment.

SELECTED REFERENCES ON THE PROGRAMMING PROCESS

Department of the Navy Programming Manual is the primary source of information for all aspects of the PPBS system. Its four chapters provide a broad overview of the PPBS process while its numerous appendixes and annexes contain detailed procedural guidance and reference information.

DOD Instruction 7045.7, "Implementation of the Planning, Programming, and Budgeting System (PPBS)," establishes Navy responsibilities for processing and maintaining documents, records and reports for the DOD programming system. DOD Instruction 7045.7 provides procedural guidance for processing changes to the FYDP, for review, analysis and approval of new programs, and for maintaining and updating of the program structure.

DOD Directive 7045.14 establishes policy, procedures, and responsibilities for the PPBS system.

SECNAV Instruction 5000.16, "Department of the Navy Planning, Programming, and Budgeting System (PPBS)," establishes responsibilities of Navy organizations in FYDP-related processes.

POM-(FY)-1, "Program Objective Memorandum Procedures for POM-(FY)" is the primary source for POM preparation information. It is issued each year by the Director, Navy Program Planning (OP-08).

ABBREVIATIONS USED IN THE FLOW CHART PRESENTATION OF THE PPBS PROCESS

ASD(C)	ASD (Comptroller)
BAM	Baseline Assessment Memorandum
CEB	CNO Executive Board
CINC	Commander in Chief (of Unified and Specified) Command
CJCS	Chairman of the Joint Chief of Staff
CNO	Chief of Naval Operations
DEPSECDEF	Deputy SECDEF
DG	Defense Guidance
DNCPPG	DON Consolidated Planning and Programming Guidance
DOD	Department of Defense
DOD COMPT	Comptroller of the Department of Defense
DON	Department of the Navy
DPSB	DON Program Strategy Board
DRB	Defense Resources Board
IPL	Integrated Priority List
JCS	Joint Chiefs of Staff
JPAM	Joint Program Assessment Memorandum
JSPD	Joint Strategic Planning Document
MBI	Major Budget Issues
MPR	Mid-POM Review
NAVCOMPT	Office of the Comptroller of the Navy
NCC	Navy Component Commanders
NSC	National Security Council
OASD(C)	Office of the ASD (Comptroller)
OASD (PAE)	Office of the ASD (Program Analysis and Evaluation)
OJCS	Office of the JCS OMB Office of Management and Budget
OPNAV	Office of the Chief of Naval Operations
OSC	Office of the Secretary of Defense
OUSD(A)	Office of the Under Secretary of Defense (Acquisition)
OUSD(P)	Office of the Under Secretary of Defense (Policy)
PBD	Program Budget Decision
PCI	Preliminary Claiment Inputs
PDM	Program Decision Memoranda
PDRC	Program Development Review Committee
POM	Program Objectives Memorandum
PPI	POM Preparation Instructions
PRC	Program Review Committee
SECDEF	Secretary of Defense
SECNAV	Secretary of the Navy
SPP	Sponsor Program Proposals
SPPD	SPP Document

Chapter 4
BUDGET PREPARATION AND JUSTIFICATION

TABLE OF CONTENTS

Chapter 4
BUDGET PREPARATION AND JUSTIFICATION

This chapter covers the development, presentation and justification of the budget, a process beginning more than 17 months before the start of the fiscal year and extending to passage of the Appropriation Act. (Steps 72 through 83 in the flowchart in Section 3.5 of the preceding chapter present the process for developing the DON budget from its initiation following approval of the POM through submission of the President's Budget to the Congress in January.)

This chapter concerns the objectives and mechanism of the RDT&E budgetary process, as well as the responsibilities of various executives and agencies involved in its developments. The chronology of budget events carries a note of caution: no two years are ever exactly alike. The process of Congressional justification will be covered subsequently.

4.1 PLACE AND IMPORTANCE OF BUDGETING IN THE MANAGEMENT PROCESS

In the budget formulation process programs must compete for approval and implementation. Just as plans are meaningless unless they are approved for inclusion in the Five-Year Defense Program (FYDP), programs are not valid until they achieve inclusion in the budget. In this continuous process, plans are translated into programs and programs are incorporated into budget items on a selected basis.

A program's appearance in the FYDP is not a guarantee that it will be funded. The budget is constrained by estimated national dollar revenues irrespective of the approved Total Obligational Authority (TOA) for the budget year in the FYDP. Since the financial resources allocated to defense in any given year usually are less than the total of the programs approved in the FYDP, some programs normally are reduced or deleted when the budget is formulated. Programs may be adjusted or omitted to reduce the overall Defense or Federal budget, provide for other programs of higher priority or offset increased costs of other programs in the budget.

After approval, the budget becomes the framework for day-to-day management. The First Hoover Commission emphasized this in 1949 when it stated: "The budget and appropriation process is the heart of management and control of the executive branch."

4.2 BUDGETING TERMS AND CONCEPTS

Knowledge of the following terms and concepts is essential for an understanding of the budget process.

Mark-up—The process of modifying budget submissions; reducing, increasing, revising or eliminating items; and providing guidance resulting from the review process.

Reclama—A request for restoration of all or part of a reduction in a budget estimate made by a higher review level.

Appeal—Alternative term for reclama. The term appeal is used in communications with congressional committees.

Appropriation—An annual act of Congress making budget authority available for specified purposes and to make payments out of the Treasury. Appropriations vary in the length of time the funds remain available for obligation. Annual appropriations are available for only twelve months; multiyear appropriations for a definite period of two or more years; continuing or "no-year" appropriations are available until expended. The RDT&E,N appropriation is available for obligation only for 24 months.

Appropriation Manager—The official responsible to the Secretary of the Navy for formulation, presentation and execution of a budget appropriation. The Assistant Secretary of the Navy (Research, Engineering, and Systems) is Appropriation Manager for RDT&E,N.

Project Listing—A computer-based display of an entire DON RDT&E Program by program elements, budget projects and associated dollars. It is used to support budget submissions to NAVCOMPT, OSD, OMB, and the Congress; and for POM submissions and apportionment requests.

DOD Instruction 7045.7; DON Programming Manual, Annex 4, Part B

4.3 BUDGETARY STRUCTURE

DON Programming Manual, Annex 3

4.3.1 Appropriations. Congress appropriates Defense funds for a given fiscal year in an Appropriation Act, of which the principal seven subdivisions are:

Title I:	Military Personnel
Title II:	Operation and Maintenance
Title III:	Procurement
Title IV:	Research, Development, Test and Evaluation (RDT&E)
Title V:	Revolving and Management Fund
Title VI:	Related Agencies
Title VII:	General Provisions.

4.3.2 Budget Activities. The Congressional Budget and Impoundment Control Act of 1974 (see 4.4.5) requires that budget submissions contain a presentation of "a detailed structure of national needs." Accordingly, mission-oriented budget activities have supplanted the hardware-oriented budget structure into which the RDT&E,N appropriation previously was classified. RDT&E budgets now are divided for Congressional presentation into the following budget activities:

1 Technology Base
2 Advanced Technology Development
3 Strategic Programs
4 Tactical Programs
5 Intelligence and Communications
6 Defense-wide Mission Support.

Ref.: DON Budget Guidance Manual (NAVCOMPT 7102.2)

4.3.3 Purpose of Appropriation Structure. The appropriation structure provides the Congress a convenient means of correlating the RDT&E appropriation with various procurement appropriations. The structure also identifies the dollars relating to the major missions of the Navy. The budget presents the Congress with line items, at the program element level, comprising the programs for the ensuing or budget year.

4.4 THE BUDGETARY PROCESS

Programs in the POM-submission (FYDP) are revised for Budgetary submission to reflect fiscal constraints, changes in threat assessment, Congressional action and so forth. Upon approval, this Budget submission reflects the decisions of

SECDEF. The revised programs then are converted to the appropriation structure, consisting of the four-year period of the previously approved prior and current years and the two years being submitted for approval, to be presented in the budget and is supported by detailed lists of items and dollars. Items including production schedules, prices, leadtime, activity rates, personnel grade structure and training requirements, among others, are required for the program proposed for budget inclusion.

4.4.1 "Balanced Program." A budget which provides optimum value for a given level of expenditure, i.e., "the best bang for the buck" is in a balanced condition. In other words, it is a condition in which all responsibilities are met about equally, no item being included which is less essential than any of the items excluded from the budget. To approach this ideal goal, program options must be evaluated carefully, and items competing for budget inclusion compared. To provide a range of choices, more items initially are considered than can be included in the final list.

This list of requirements is reviewed by the next, higher organization which brings the list into balance by reducing or eliminating items considered marginal. This process is repeated through the various DOD and Congressional levels until the Congress balances Defense requirements against other national needs.

4.4.2 Incremental Programming Policy. The Incremental Programming Policy aims to ensure that only those funds required for work in a given fiscal year are included in the Authorization Request for that fiscal year. It is Navy policy to program and fund RDT&E work on an *annual incremental* basis instead of on a Procurement Appropriation's *fully funded* program basis.

Ref.: NAVCOMPT Manual, Volume 7, Part F, Chapter 074500, "Research, Development, Test and Evaluation, Navy"

4.4.3 Justification and Appeal. Justification is an integral part of the "Balanced Program" process (see 4.4.1). Each item in the budget estimate must be supported by written justification. The justification information both supports the inclusion of the proposed item and gives sufficient data to the next level of review authority concerning the details of the estimates to enable the reviewer to justify the items inclusion to subsequent authority.

Budget justification demonstrates that the proposed item and its estimate is:

- Within the law and meets approved administrative guidelines.
- Essential to the effective performance of the assigned mission.
- The most economical and effective option to accomplishing its purpose.
- Feasible in terms of timing and the availability of resources.

"Appeal" is related closely to justification and mark-up (see 4.2). Appeal has a vital role in the process of attemptingto achieve a "Balanced Program". The appeal aims at restoring an item deleted from the budget submission in a higher authority's mark-up. A successful appeal usually requires improved justification making it possible to save worthwhile programs earlier eliminated because of inadequate supporting information. Appeal instructions are provided by most review authorities.

4.4.4 Function and Source of Guidance. Procedural and substantive "guidance" plays an important part in budget preparation.

4.4.4.1 Procedural guidance. Uniformity is essential for electronic data processing equipment to summarize submissions from diverse organizations. One of the duties of the Comptroller of the Department of Defense is to establish "uniform terminologies, classifications and procedures" for use in all budgeting and accounting matters.

The means for presenting budget estimates is directed by higher authority. Justification material is required by the Office of Management and Budget (OMB) and is used to support budget estimates at each review level.

Budget Schedules and narrative are required by OMB in preparing Appendixes to the printed Federal budget. Backup Material is required by DOD COMPT. Annex Material is required by NAVCOMPT concurrent with his review. Budget Summary Table feeder data are required by NAVCOMPT for budget consolidation and publication and for use by Navy witnesses before Congress. The Office of Naval Research, in performing fiscal responsibilities as assigned by ASN(R,E&S), issues procedural guidance for submission of RDT&E budgetary data by various Navy commands and offices.

Ref.: DON Budget Guidance Manual (NAVCOMPT 7102.2)

4.4.4.2 Substantive Guidance. Annually, the Secretary of Defense issues Defense Guidance, including fiscal guidance, to define the total financial constraints within which the DOD force structure will be developed and reviewed. Broad guidance from higher levels is translated into increasingly specific guidelines at lower levels. Another source of guidance is Congressional expressed and implied intent as stated in hearings on the authorization and appropriation requests and in reports accompanying the bills reported out by the various committees.

Ref.: DOD Instruction 7045.7

4.4.5 Congressional Budget and Impoundment Control Act of 1974 (PL93-344). Public Law 93-344 made extensive and important changes in the Federal Budget process. These include: (1) moved the start of the fiscal year from 1 July to 1 October; (2) created a Budget Committee in each House; (3) created the Congressional Budget Office; (4) required estimates of the President's budget for the budget year plus four additional years; (5) provided for "year ahead" authorization requests; (6) established a requirement for two Congressional concurrent resolutions; and (7) established the principle of the "Current Services" budget to be submitted by the President in advance of the annual request for new budget authority. In addition, the Act states:

> The Budget ... shall contain a presentation of budget authority, proposed budget authority, outlays, proposed outlays, and descriptive information in terms of: 1) a detailed structure of national needs which shall be used to reference all agency missions and programs; 2) agency missions; and 3) basic programs.
>
> To the extent practicable, each agency shall furnish information ... in support of its budget requests in accordance with its assigned missions in terms of Federal functions and subfunctions, including mission responsibilities of component organizations, and shall relate its programs to agency missions.

4.4.5.1 Current Services Budget. The Current Services Budget is submitted by the President to the Congress by 10 November. It presents the estimated outlays and proposed budget authority which would be required if all programs and activities were carried on during the ensuing year at the same level as the current year, without policy changes or new programs and activities.

4.4.5.2 Concurrent resolutions. The first of the concurrent resolutions, due on 15 May, establishes target amounts for the major functional categories; e.g., Defense, General Science, International Affairs, on the basis of which the authorizing and appropriating legislation is developed. The second concurrent resolution, due on 15 September, is adopted to resolve any discrepancies between the first concurrent resolution and the legislation as passed. If necessary, it may be followed by reconciling legislation.

4.4.6 Research and Development Descriptive Summary (RDDS). The RDDS provides concise justification for each RDT&E program element. Each RDDS is to be a "stand alone" document covering purpose, structure, and activities to be funded. Originally strictly a budget back-up document for Congress, the RDDS now supports the POM, the DON budget and the President's budget. Individual RDDS are prepared by the Program Manager and submitted through the chain of command for collation into the overall RDDS document.

Ref.: DON Budget Guidance Manual (NAVCOMPT 7102.2); amplifying instructions are provided by the Director, RDT&E, Navy for each budget cycle

4.5 SUPRA-NAVY PARTICIPANTS IN THE RDT&E BUDGETARY PROCESS

4.5.1 Congress. Article I of the United States Constitution assigns to the Congress the responsibility to "provide for the common defense" and to "provide and maintain a Navy." Section 9, Clause 7 of this Article further provides that "no money shall be drawn from the Treasury, but in consequence of appropriations made by law." In carrying out these responsibilities, Congress takes a keen interest in the content of military programs and their costs. Budget estimates are considered by both the Armed Services Committees and the Appropriations Committees of both the House of Representatives and the Senate, which hold formal hearings with OSD and Service representatives. The Armed Services Committees are responsible for *authorizing* legislation to permit appropriations to be made; the Appropriations Committees are responsible for *appropriating* the funds. Full Congressional action is required to obtain an increase in authorization for a particular fiscal year once the authorization has been enacted.

The Budget Committees of the House and Senate, created by the Congressional Budget and Impoundment Control Act of 1974 (see 4.4.5), receive information from the standing committees of their respective Houses, including the Armed Services and Appropriations Committees, regarding required budget outlays and other fiscal matters falling within the jurisdiction of each. Based on this information, they draft and report to their Houses the concurrent resolutions required by the Act. The Budget Committees are assisted in this process by the Congressional Budget Office (CBO), also established by the Act. The CBO is authorized by the Act to request (and receive) necessary information both from Congressional committees and from the Executive Branch.

4.5.2 The President. The President is responsible for presenting an Executive Budget to Congress. The President, through the OMB, reviews, revises, and approves the estimates of all departments and agencies. When consolidated, these estimates become a complete government-wide financial plan for the following fiscal year. The President is responsible for the integrity and validity of the estimates contained in the Executive Budget. **By law** (Budget and Accounting Act of 1921), no official *of an executive department or agency may take any action or volunteer any opinion that is contrary to official budget policies as expressed by the President in his budget*, except through proper official channels (see 4.8.2).

4.5.3 Office of Management and Budget (OMB). The OMB assists the President in preparing the budget and formulating the Government's fiscal program. It also supervises and controls the administration of the budget.

Ref.: United States Government Organization Manual

4.5.4 Secretary of Defense (SECDEF). The Secretary of Defense participates actively in the

budgetary process. Either the Secretary or his deputy issues all Program Budget Decisions (PBDs) reflecting major budgetary decisions. SECDEF also plays a major role in the justification of the budget before Congressional committees.

SECDEF is assisted in carrying out budgetary responsibilities by various officials and organizations discussed in Appendix E. They include: USD(A) (see E1.1), DOD Comptroller (see E1.4), ASD(PA&E) (see E1.5) and the Defense Resources Board (see E9.6).

4.6 NAVY PARTICIPANTS IN THE R&D BUDGET PROCESS

The development and justification of the Navy's budget for research, development, test and evaluation is a sequential and iterative process. Eight senior DON executives play major roles in this process.

Ref.: SECNAV Instruction 5430.67

4.6.1 Secretary of the Navy. The Secretary of the Navy (SECNAV) is responsible for preparing and submitting the Navy budget to the Secretary of Defense, the Office of Management and Budgets (OMB) and The Congress. SECNAV is assisted in carrying out these duties by Navy Department Operations, R&D and finance executives.

4.6.2 Navy Comptroller. Reporting to the SECNAV, and subject to policies of the DOD Comptroller, the Navy Comptroller (NAVCOMPT) develops and establishes Navy Department fiscal principles and policies. He also prescribes procedures regarding budget preparation and administration, financial management and accounting, auditing, disbursing and reporting. NAVCOMPT assists the SECNAV by translating Navy and Marine Corps policies, plans and programs into the formal budget for presentation to SECDEF, the OMB and to The Congress. The NAVCOMPT also issues binding guidance to the various Commands and Offices concerning the forms and contents for submitting budget estimates and supporting data, and on the availability of funds and the purposes for which they may be spent.

4.6.3 Assistant Secretary of the Navy for Research, Engineering and Systems. The ASN(R,E&S) (see 1.4.3) is responsible for managing the appropriation "Research, Development, Test and Evaluation, Navy." He also is responsible for policy supervision of all RDT&E activity within the Department of the Navy. In discharging these responsibilities, the ASN(R,E&S) is assisted by the Director, RDT&E, the Chief of Naval Research, the Oceanographer of the Navy, the Director of Navy Laboratories and the Commanding General, MCRDAC.

4.6.3.1 Director of Research, Development, Test and Evaluation. The officer who is the Director of Research, Development, Test and Evaluation (DRDT&E), reports to the ASN(R,E&S). He also, in the capacity of Director, Research & Development Requirements, Test & Evaluation (DR&DR,T&E), is responsible to the Chief of Naval Operations (see 1.4.6.1, Exhibit 1-1 and E2.1.3.2). The DRDT&E coordinates for the ASN(R,E&S) programs concerning Advanced Development, Engineering Development, Operational Systems Development, and Management and Support, i.e., RDT&E Categories 6.3, 6.4, 6.5, and 6.6 (see 2.2.7.3 thru 2.2.7.6). The Chief of Naval Research (CNR) coordinates Research and Exploratory Development programs for the ASN(R,E&S), i.e., RDT&E Categories 6.1 and 6.2 (see 2.2.7.1 and 2.2.7.2).

In addition, the Director, RDT&E assembles, integrates and coordinates the DON Program and Project Listings of all Navy and Marine Corps R&D programs. He works with the Commandant of the Marine Corps and the Chief of Naval Research in carrying out this function.

He provides RDT&E program guidance to the Naval Medical R&D Command, the Office of the Chief of Naval Research and the Office of the Commandant, Marine Corps. His staff reviews the content of the program justification consolidated by the Office of the CNR, and coordinates presentations of Navy's RDT&E programs to the USD(A), the Comptroller of the Department of Defense, and the OMB. As Director, RDT&E for the CNO, he participates in preparing appeals resulting from budget mark-up actions by the Navy, OSD or the Congress. The ASN(R,E&S), the DRDT&E, the CNR and the CG,MCRDAC serve as the Navy's principal witnesses before Congressional committees regarding RDT&E programs. In addition, the Director, RDT&E coordinates all justification for Congressional committees.

Ref.: SECNAV Instruction 5430.95

4.6.4 Chief of Naval Operations. The Chief of Naval Operations (CNO) is responsible for determining and planning the material support needs of the Navy's operating forces, excluding those of the Marine Corps (see 1.4.6 and E3). He is responsible for overall coordination, content and priorities of the programs for which the budget is designed to support. The CNO, thus, has a vital interest in budget development and support. The CNO's Executive Board (CEB) assists the CNO in administering his budget program responsibilities (see E9.5).

4.6.4.1 Deputy Chief of Naval Operations for Navy Program Planning. The Deputy Chief of Naval Operations (DCNO) for Navy Program Planning, or OP-08, is responsible for integrating "planning, programming, budgeting and appraising" within the Office of the CNO. This officer reviews programs, financial and manpower decisions, evaluates their impact on the total Navy activity, and recommends adjustments to restore desired balance. His Navy Program Planning Office (NPPO) is the primary OPNAV point of contact for program and budget matters (see E3.7).

4.6.5 Commandant of the Marine Corps. The Commandant, Marine Corps (CMC) is responsible for determining and planning the material support needs of the Expeditionary Marine Forces, the Fleet Marine Forces Air Wings and other Marine activities. He is assisted by the Commanding General, MCRDAC, assembles, integrates, prioritizes and coordinates the annual programs, submitting it to the ASN(RE&S) and to the CNO for inclusion in the DON's Program and Project Listings of Navy and Marine Corps RDT&E Programs (see E6).

4.6.6 Chief of Naval Research. The Chief of Naval Research (CNR) coordinates the Navy's Basic Research and Exploratory Development Programs, and is responsible to the ASN(R,E&S) for providing program justification. He also provides the ASN(R,E&S) budgeting, accounting and related reporting services required for managing and controlling the RDT&E appropriation.

Comptroller of the Office of the Chief of Naval Research sets forth budget policies and procedures for the RDT&E program. In addition to providing budget preparation guidance and instructions to the various commands and offices, he coordinates preparation of budget estimates which, following review and approval of the ASN(R,E&S), are submitted to the SECNAV, OSD, OMB and The Congress.

The OCNR Comptroller also acts as Special Assistant to the ASN(R,E&S) for fiscal matters, providing technical guidance and direction required to support the planning and programming responsibilities of the ASN(R,E&S), the Director, RDT&E, the CNO and the CNR.

The OCNR Comptroller assists the Director, RDT&E, in consolidating the DON's Program and Project Listings for RDT&E programs. However, he does not evaluate programs to accommodate

fiscal controls or to establish balance. This task is performed for the ASN(R,E&S) by the Director, RDT&E with counsel and assistance by the CMC and CNR.

Ref.: SECNAV Instructions 5430.20, 5430.55

4.7 BUDGET DEVELOPMENT AND JUSTIFICATION

Certain specifics of the budgetary process may change from time to time, but the principal steps remain quite constant. The principal steps in developing the fiscal year RDT&E budget are shown in the Planning, Programming and Budgetary System (PPBS) diagram in Chapter 3. Particular attention should be given steps 44 through 55.

4.8 JUSTIFYING THE BUDGET BEFORE CONGRESSIONAL COMMITTEES

Following the President's Annual Budget Message, DOD budget estimates are sent to the Senate and House Armed Services and Appropriations Committees for review. Congressional review of the Defense portion of the President's budget is undertaken from the separate standpoints of authorization of programs and appropriation of funds. Authorizing legislation is prepared by the Senate and House Armed Services Committees, and appropriations legislation by the Defense Subcommittees of the Senate and House Appropriations Committees. The Congressional review process may involve hearings before these four committees and possibly their appropriate committees. The role of the Budget Committees primarily regards fiscal constraints. These committees were established by the Congressional Budget and Impoundment Control Act of 1974 (see 4.4.5). However, during the budget process the Budget Committees receive testimony, mostly of a general nature, both from the Service Chiefs and the DOD and Services' staffs. The Congressional Budget Office may request staff briefings of a more detailed nature on Defense programs.

For the RDT&E appropriation, the four committees receive a justification book containing R&D Descriptive Summaries (RDDS) and RDT&E Programs (R-1). The RDDS (see 4.4.6) provide specific data on program elements and projects within each element listing of programs showing funding for the prior fiscal year, the current fiscal year and a plan for the subsequent two years.

Using this material, the committees conduct hearings to establish for the record the Services' position on major issues. Initial hearings on the RDT&E authorization are held by the R&D Subcommittee of the House Armed Services Committee. The recommendations of the full committee are acted upon by the full House. The Senate Armed Services Committee conducts its hearings in parallel with those of the House Committee, and the full committee reports recommendations on the Authorization Bill as passed by the House. Where there are differences between the bills passed by each body, the two committees meet in conference and arrive at an agreed joint position that is submitted to the two Houses for approval and enactment. The authorization as enacted establishes the maximum amount that may be appropriated by the Congress.

The procedure on the appropriation is similar in that the House Appropriations Committee generally acts first. The Defense Subcommittee holds hearings, and the full committee recommends an appropriation bill to the House. The Defense Subcommittee of the Senate Appropriations Committee holds hearings in parallel and recommends appropriate changes to the appropriations bill as passed by the House. Where differences exist between the Senate bill and the House bill, a conference meeting is held between representatives of each body, and a jointly agreed position is reported out. Upon approval by

both bodies and signature by the President, it becomes law.

Ref.: DOD Directive 5400.4; SECNAV Instruction 5730.5; NAVCOMPT Instruction 7121.3; Navy Witness Guide (NAVSO-3036)

4.8.1 Guidelines for a Congressional Committee Witness. A witness testifying on the budget before a Congressional Committee does so as a member of the Executive Branch supporting the "President's Budget." The witnesses are expected carefully to avoid volunteering views differing from the budget, either on or off the record. Direct questions must be answered frankly. However, should a witness feel compelled to express personal views inconsistent with the President's budget, the witness will emphasize that the President's judgment was reached from his overall perspective as head of the government and in view of overriding national policy. The witness should make clear that his personal comments are not to be construed as a request for additional funds.

Title 31, U.S. Code 15 states the following regarding an Executive Department's witnesses' relationship to the President's budget:

> No estimate or request for an appropriation and no request for an increase in any item of any such estimate or request, and no recommendation as to how the revenue needs of the Government should be met, shall be submitted to Congress or any committee thereof by an officer or employee of any department or establishment, unless at the request of either House of Congress.

It is imperative that Congressional Committee witnesses be thoroughly familiar and stay within the bounds of the foregoing Title 31 provision so that all testimony supports the President's budget.

4.8.2 Hearing Preparation. Preparation for hearings should assure that all members' questions may be answered using a minimum number of witnesses. Consequently, the few witnesses expected to provide the main testimony require extensive preparation.

Preliminary hearings liaison with the Appropriations Committees is the responsibility of NAVCOMPT, liaison with other committees is through the Navy's Office of Legislative Affairs. These contacts will determine areas of probable committee interest, estimates of hearings duration and, in some instances, specific questions which may be asked. Trends of prior hearings' questioning may justify special preparation in certain areas. This is particularly true of questions developed in the hearings of other Services or of other Navy organizations. Current press or news articles may generate spontaneous questions for which the witness should be prepared. Thorough review of the previous years' testimony is mandatory.

Principal witnesses submit a prepared statement in advance of testimony. These statements receive careful Navy and OSD review prior to submission to the Committee; Committee receipt will be 48 hours before scheduled hearing.

4.8.3 Conduct of Hearing. The SECDEF and members of the Joint Chiefs of Staff testify on the overall program before the Authorization Committees. These are known as "Posture Hearings." The USD(A) is the principal DOD witness on RDT&E programs before both Authorization and Appropriation Committees. The SECDEF also testifies at Appropriation Hearings.

The ASN(R,E&S) is the principal witness concerning Navy RDT&E program and appropriation requests before both Authorization and Appropriation Committees. He is supported by the Director, RDT&E, the CG,MCRDAC, the CNR, the Director of Navy Laboratories, the Navy's Oceanographer and other senior advisors.

There is no rigid custom for the conduct of hearings, and the Committee Chairman may vary the procedure as he chooses. Generally, the principal witness provides a brief statement, submits a comprehensive statement for the records

and responds to questions. Visual aids may be used to augment the prepared statement.

Hearings on the RDT&E appropriation frequently occur in executive session because of the security classification of matters discussed. Should the discussion focus on a particularly sensitive subject, the witness may request that it not be recorded, i.e., that it be "off-the-record."

Occasions may occur, despite diligent preparation of reasonable scope, when a witness is not able to provide requested information or to respond adequately to a question. At these occasions he may request permission to "provide it for the record."

4.8.4 Review and Editing the Transcript. Congressional Committees permit the witness to review and correct his testimony transcript. Corrections, however, are limited to grammar and obvious errors, but the testimony's substance cannot be altered. "For the record" information is added in this process. Classified portions of the testimony are bracketed, and do not appear in the printed version. This provision applies also to questions containing classified data asked by Committee members.

Only one or two working days generally is permitted the Services for review and editing of the record. The Director, RDT&E coordinates this activity for the Navy's RDT&E appropriation.

4.8.5 Heartburns and Appeals. "Heartburns" and "appeals" reclama committee language or recommended program funding (see 4.2). "Heartburns" are those appeals to overriding importance.

Heartburns and appeals are submitted to the Authorization and Appropriation Committees in response to their actions on the Department's budget rquest. They must be in clear, concise, non-technical language, understandable by readers not familiar with the technology of the program.

Ref.: DON Budget Guidance Manual (NAVCOMPT 7102.2)

4.9 LATE APPROPRIATIONS

In instances in which an appropriation has not been passed before the beginning of a fiscal year, the Congress normally passess a "continuing resolution" which permits agencies to spend at the lesser rate of (1) that achieved in the previous year or (2) that reflected in a prior action of Congress. During the period of operation under the continuing resolution, new starts, program buildup, and similar activities generally are not permitted.

SELECTED REFERENCES ON BUDGET PREPARATION AND JUSTIFICATION

OMB Circular No. A-11, "Instructions for the Preparation and Submission of Annual Budget Estimates." It is revised on a continuous basis.

SECNAV Instruction 5430.67, "Assignment of Responsibilities for Research, Development, Test and Evaluation," assigns specific duties and responsibilities to the CNO, CMC, and CNR in the implementing ASN(R,E&S) responsibilities.

DON Budget Guidance Manual (NAVCOMPT 7102.2) provides guidance for the preparation, submission and review of the budget estimates submitted to NAVCOMPT, OSD, OMB, and the Congress. Copies of this manual are provided to all budget submitting offices, Appropriation and Resource Sponsors and other selected staff offices.

NAVCOMPT Instruction 7121.3, "Department of the Navy Annual Budget Hearings Before the

Congressional Appropriations Committees; information for witnesses." In addition to useful information for witnesses, it also provides preocedure for review of hearing transcripts prior to release.

Navy Witness Guide (NAVSO-3036). This guide is updated annually by the DON Office of Legislative Affairs.

Chapter 5
EXECUTION OF THE RDT&E BUDGET

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Chapter 5
EXECUTION OF THE RDT&E BUDGET

The previous chapter described the RDT&E budget process from its initial preparation until its approval as part of the annual Appropriation Act by Presidential signature. This process requires more than 18 months to complete. This is not the conclusion of the budgetary activity. The process continues within the Congress, the Office of Management and Budget (OMB), the Office of the Secretary of Defense (OSD) and the Navy until specific funds are approved, released and obligated. Even following the expenditure of funds, in a sense the process still continues with auditing and control procedures. These matters are the subjects of this Chapter.

5.1 APPORTIONMENT

Funds must be apportioned before they can be obligated and spent. The Federal Government's apportionment process dates from the late 19th Century. Its purpose was to ensure that expenditures were spread throughout the year to avoid periodic needs for deficit appropriations.

Apportionment is a determination by the Director of OMB as to the amount of funds which may be obligated in a specific period under an appropriation, contract authorization or other statutory authorization. An apportionment may relate to all obligations within a single appropriations account to be incurred in a specific period or to obligations to be incurred for an activity project, program, function or object. Additional information is found in the Revised Statutes as amended (31 U.S.C. 1517).

Ref.: DOD Directives 7110.1 and 7200.1

5.1.1 Apportionment Request. NAVCOMPT submits the Apportionment Schedule (see 5.1.2.1) to the Comptroller of the Department of Defense within 5 days after passage of the Appropriations Act. The same Schedule is required by the OMB within 15 days subsequent to passage of the Act.

Upon receipt of the approved apportionment from OMB via OSD and considering the recommendations of OSD and the ASN(R,E&S), NAVCOMPT allocates the RDT&E,N appropriation to the ASN(R,E&S) who makes further allocations to the various RDT&E,N administering offices.

Prior to the beginning of the fiscal year, the USD(A) transmits program guidance to the Services including his recommendations for program approvals. This is in response to the Services' program submissions in support of the Apportionment Request. The USD(A) also indicates the portion of the program which is not approved and the reason for his decision.

5.1.2 RDT&E,N Apportionment Documentation. NAVCOMPT notifies ASN(R,E&S) of the RDT&E,N funds apportionment and the approved allocation by use of the following documents.

5.1.2.1 Apportionment (or Reapportionment) Schedule (DD Form 1105). The actions of the NAVCOMPT, the OSD and the OMB

regarding apportionment requests concerning RDT&E,N appropriation are recorded on this document. Appropriated funds are not available for the Navy's obligation until final authorization is completed by the OSD (See 5.1.2.2).

5.1.2.2 RDT&E Program/Fund Authorization (SD Form 440). Signed jointly by the USD(A) and the DOD Comptroller, this document specifies the amounts approved and disapproved (deferred) by OSD for each program element for obligation.

5.1.2.3 RDT&E,N Budget Activity Allocations (NAVCOMPT Form 2058). This document makes the allocation of funds to the ASN(R,E&S) from the NAVCOMPT. It reflects all actions contained on the SD 440 and any changes approved by NAVCOMPT. When appropriate, the NAVCOMPT will note in the transmittal letter to the ASN(R,E&S) additional fiscal guidance.

5.1.3 RDT&E,N Operating Budget Allocation Documentation (NAVCOMPT Form 2197). The Chief of Naval Research, acting for the ASN(R,E&S), uses this document to allocate approved funds to the various RDT&E administering organizations. Allocations are made in accordance with OMB, OSD and NAVCOMPT levels of allocations and apportionments. They also are based on CNR and DRDT&E program guidance for their respective program areas.

5.1.4 Navy Actions Required by General Provisions. The Authorization and the Appropriation Acts, and reports on them, contain general provisions requiring Navy action. The Chief of Naval Operations, General Planning and Programming Division (OP-806) reviews these data, and assigns specific responsibility for compliance and follow up.

Ref.: DOD Directive 5545.2; DOD Instruction 5545.3 (NAVCOMPT 7130.25; NAVCOMPT Instruction 7130.25)

5.1.5 Administrating Deferrals. Deferrals of fund obligations initiated by the USD(A), DOD Comptroller, or Navy executives may be temporary or of indefinite duration. Temporary deferrals may require only the completion of Congressional action on the Appropriations Act or submission of additional program data. Indefinite deferrals normally require at least major program change.

In terms of day-to-day operations, as the fiscal year progresses, partially deferred programs may be jeopardized. In such situations, the need for additional incremental fund releases must be anticipated to avoid work stoppages and to preserve contractor relationships.

Some programs continue in a deferred status throughout the fiscal year because the USD(A) and/or the DOD Comptroller do not believe that justification for approval is adequate. These deferred program funds may be carried over into the next fiscal year, used for the original purpose when eventually approved or the funds may be reprogrammed to meet other program's funding requirements.

5.2 OBLIGATION AND EXPENDITURE OF FUNDS

The apportionment, allocation and allotment process extends the authority to obligate funds down through the organization. The process makes it possible to issue orders, make contracts and take other actions establishing obligations for eventual funds expenditure. Obligation authority and program approval are the tools controlling budget execution.

Ref.: DOD Directive 7200.1

5.3 ACCOUNTING FOR RESEARCH AND DEVELOPMENT

The financial management system is dynamic. Change and improvement will continue to characterize the research and development

accounting, reporting and resource management system.

Ref.: DOD Instruction 7220.24, NAVSO P-3062 Financial Management of Resources, RDT&E,N; NAVCOMPT Instruction 7044.8

5.3.1 Objectives of R&D Accounting. The basic objectives of the R&D accounting system are to:

- Provide a standardized method and data base for collecting and reflecting finance oriented information used in programming, budgeting, accounting and control.
- Meet manager's reporting needs at all DOD echelons.
- Estimate and justify funds requirements for the implementation of plans.
- Comply with data requirements of The Congress, OMB, the Treasury and other government organizations.
- Identify all costs with specific programs, systems and other "end-product" and by performing activity.
- Conform with statutory requirements for financial management systems, including accounting principles and standards set forth by the U.S. Comptroller General and related legislation.
- Employ the most efficient information processing techniques, including optimum standardization of data elements and codes and the use of electronic processing systems.

The purpose for accounting systems has undergone historic transition. When first established, the primary goal of such systems was to prevent breaches of trust and misappropriation of public funds. They were, therefore, concerned primarily with the purposes for which funds were appropriated and the status of unobligated monies.

While these objectives for the systems still exist, emphasis today is on resource management, i.e., using the accounting and control systems to help assure the most productive use of funds. Accordingly, the present R&D accounting and control system is designed to:

- Focus on outputs and resources used.
- Improve manager's accountability for the effective and efficient use of resources.
- Compare actual against planned performance.
- Use operating budgets as a basic management control device at each organization level.

The following paragraphs discuss the continuing evolution in accounting techniques aimed at interjecting more effectiveness and feedback into the planning, programming and budgeting phases of financial management.

5.3.2 Harmonizing Programming, Budgeting, and Accounting. A basic improvement in the accounting system has been collecting financial data through uniform accounting classifications used by all RDT&E,N managers. These classifications provide uniform techniques for data collection down to the lowest level of management concern, and are based on the structures used in programming and budgeting.

5.3.3 Identification of RDT&E Costs. Effective identification of RDT&E costs depends on:

- Distinguishing "investments" from "expense"
- Ensuring that the RDT&E,N appropriation is chargeable for all feasible and appropriate R&D costs.

Ref.: DOD Instruction 7040.5 (SECNAV 7040.6); DON Budget Guidance Manual (NAVCOMPT.7102.2); NAVCOMPT Manual

5.3.3.1 Expenses vs investments. Current instructions provide guidance for assigning costs to "expenses" or "investment" categories. The criteria consider (1) the qualities of the item, such as durability, in the case of an investment cost, or consumability, in the case of an operating cost; and (2) the circumstances under which an item is used or the way it is managed.

5.3.3.2 Research and development cost definition. Applicable instructions provide criteria to answer the question, "What is an RDT&E cost?" These instructions establish definitions and criteria used in specifying and classifying (1) R&D program resources of the Five-Year Defense Plan (FYDP), (2) the programs and financial content of accounts concerning R&D accounts in the DOD budget and (3) the financial content of R&D accounts within the DOD management accounting system.

5.3.4 Distribution of Costs to Applicable R&D Projects. Several systems are used to distribute costs incurred by each RDT&E activity to the specific job. Large, complex RDT&E activities, such as the Naval Air Development Center, employ working capital funds. Less complex activities employ operating budgets as alternative working capital arrangements. Small and relatively simple activities relate costs to results without such sophisticated accounting devices.

5.3.4.1 Navy Industrial Fund. The Navy Industrial Fund (NIF) provides working capital for an industrial-type activity, such as a shipyard, laboratory or aircraft-overhaul organization. Under NIF, the activity pays its expenses—manpower, material, utilities, administration, etc.—from working capital, and charges its customers the *full* cost of its products or services. These costs, compared with industry and other industrially-funded Government organizations, provide a measure of the organization's efficiency in the use of resources.

Ref.: DOD Directive 7410.4; NAVCOMPT Instruction 7331.1

5.3.4.2 Operating budgets. The operating budget is a tool for managing the financial resources available to the individual activity. In a single plan, the operating budget includes all direct and reimbursable funds, and provides annual budget estimates and periodic performance reports (against the estimate).

The operating budget divides an activity into "cost centers," an arrangement which pinpoints responsibility for effective use of resources.

Financial plans and accounting reports supporting the operating budget provide analyses of direct, indirect and general costs by cost center, and show the basis for and distribution of indirect and general costs to direct work. These techniques are used in facility management.

5.4 PROGRAM MANAGEMENT PROPOSAL

Before funding proposed changes to an ongoing acquisition program, a Program Management Proposal (PMP) covering the proposed change and costs must be approved by SECNAV (See 3.4.21).

Ref.: SECNAV Instruction 5000.33

5.5 REPROGRAMMING

One of the principal functions of the R&D manager is making tradeoffs by moving resources among programs and projects to achieve their most productive use. The execution of the program, in the interest of maximum effectiveness, inevitably will require changes since the budget submission is based on plans that are generally at least 15 months old by the time execution begins.

While management effectiveness may demand shifting funds from a specific originally planned use to other more useful applications, the maintenance of good faith with Congress requires that funds be spent for the purposes justified before Congress.

Congressional committees concerned with the Department of Defense Authorization and Appropriations Acts generally agree that rigid adherence to the amounts justified for individual budget activities or programs may unduly jeopardize the effective and economical accomplishment of planned programs, and that unforeseen occurrences may require some diversion of funds from the purposes for which they originally were intended.

Reprogramming procedures, developed in consultation with the committees, provide for retention of Congressional control over the use of Defense appropriations by making sure that the Congressional intent is carried out while, at the same time, this procedure provides a practical device for achieving flexibility in the execution of programs.

The Senate and House Armed Services and Appropriations Committees have directed that DOD adhere, within certain accepted variances, to the program justified in the budget. Before any changes which exceed established thresholds are made in a budget program, or any change is made in a "special interest" program, a reprogramming action must be taken which provides both committees a description of significant variations from the justified amounts and purposes. The established procedures are as follows:

- Establish the base for reprogramming actions. All reprogramming actions are taken in relation to a "Base for Reprogramming Actions" established immediately after final Congressional authorization and appropriation action. It is submitted on DD Form 1414 through OSD to the Congressional committees and identifies the purposes in terms of program elements for the RDT&E appropriation, and the amounts for which funds have been authorized and appropriated. It also reflects the specific application of adjustments made by the Congress. It is considered to be final only upon review and approval by the Congress.
- Specify actions requiring prior SECDEF and/or Armed Services and Appropriations Committees' approval. All reprogramming actions involving the application of funds to items, programs or functions in which the Congressional committees have expressed a special interest require *prior* SECDEF and Congressional approval.
- Specify actions requiring prior SECDEF approval and notification to the Armed Services and Appropriations Committees. Any reprogramming action involving an increase of four million dollars or more in any program element, the addition of a new program element of two million dollars or more, or the addition of a new program element estimated to cost ten million dollars or more over a three-year period, requires the prior approval of SECDEF. For decreases, the prior approval of SECDEF is required if a program element is reduced over 20% or over four million dollars, whichever is greater, from the base for reprogramming. SECDEF will notify the Congressional Committees of such approval.
- Specify actions requiring other special handling with Congress. This includes restrictions on program terminations. Specifically the House and Senate Appropriation Committees will be notified by the SECDEF of any approved reprogramming which would result in the termination of any program element, regardless of dollar value, or any R&D project of ten million dollars or more.

Ref.: DOD Directive 7250.5 (NAVCOMPT 7133.1); DOD Instruction 7250.10 (NAVCOMPT 7133.1); NAVCOMPT Instruction 7133.1

5.5.1 Reprogramming Procedures. The request for Reprogramming Approval (DD Form 1415) includes an explanatory statement summarizing the need for the reprogramming. This statement contains all the information necessary for critical review by authorities and Congressional committees. The action must identify all compensating increases and decreases with the appropriation total so that there will be no addition or reduction in the individual reprogramming proposal. This does not apply when the reprogramming involves a transfer of funds into or out of the appropriation, a difference that would then result in a net change to the appropriation total.

All RDT&E reprogramming actions involving prior approval or notification of Congressional committees will be reviewed by USD(A) for concurrence or comment before being routed to the Secretary of Defense.

Advance notification of below-threshold reprogramming actions for new programs or line items not otherwise requiring prior approval (or notification action), will be made to the House and Senate Appropriations Committees. This notification will be made by letter directly to the committees by the DOD Component concerned, after coordination with the ASD(C).

5.5.2 Reprogramming Hearings. Periodically, reprogramming hearings are conducted by Congressional committees.

5.5.3 Reprogramming Reports. Semi-annually, the "Report of Programs" (DD Form 1416) is submitted to Congressional committees, summarizing all reprogramming actions approved during the period, including those which did not, individually, require submission of reprogramming proposals to the Congressional committees.

5.5.4 Internal Navy Reprogramming in RDT&E,N. Reprogramming actions among R&D projects, within a program element and among program elements may be approved by the ASN(R,E&S) within the restrictions imposed by Congress as provided in NAVSO P-3062-1, Financial Management of Resources, RDT&E,N. ASN(R,E&S) has delegated this authority in the Technology Base to the Chief of Naval Research. In the other four categories of the RDT&E,N appropriation and with the exception of Marine Corps programs therein this authority has been delegated to the Director, Research, Development, Test, and Evaluation. Similar authority for Marine Corps programs in categories 3 through 6 has been delegated to the Commanding General, Marine Corps Research, Development, and Acquisition Command. However, any change to programs in Acquisition Categories I and II and other programs designated as "ASN(R,E&S) special interest" requires the approval of ASN(R,E&S). A further delegation of reprogramming authority has been made to the claimants, empowering them to make cumulative changes to any project of up to $200,000 in categories 3 through 6, provided the change is within the overall Congressional limitations stated above and ACAT I, II and Congressional, OSD and ASN(R,E&S) special interest items are not improperly affected. In the Technology Base the Chief of Naval Research delegates reprogramming authority at his own discretion.

Ref.: ASN(R,E&S) letter, dtd 8 July 1975; ASN(R,E&S) memorandum, dtd 23 September 1983; DOD Directive 7250.5; DOD Directive 7250.10; NAVCOMPT Instruction 7133.1; NAVSO P-3062-1

5.6 AUDITS AND REVIEW

Programming, reprogramming and accounting controls are supplemented by periodic audits and reviews conducted by certain offices inside and outside the Navy.

Ref.: DOD Directives 7600.2, 7650.2; SECNAV Instructions 5740.26, 7510.7

5.6.1 General Accounting Office. The General Accounting Office (GAO) is an agency of the Congress completely independent of the Executive Branch. It is the responsibility of the Comptroller General to investigate all matters relating to the receipt, disbursement and application of public funds. The Comptroller General makes an annual report to the Congress plus special reports as needed. These reports include "recommendations looking to greater economy or efficiency in public expenditures."

Section 313 of the Budget and Accounting Act of 1921 gives the Comptroller General the power to examine all Executive Branch records. This act states that:

> ... all departments and establishments shall furnish to the Controller General such information regarding the powers, duties, activities, organization, financial transactions, and methods of business of their respective offices as he may require ...

In the past, GAO audits tended to emphasize the legality of transactions. These audits focused on accounting matters, particularly whether expenditures were made in accordance with the law and intent of Congress. In recent times, emphasis increasingly has been on the question of how efficiently, effectively and economically government business is being conducted.

5.6.2 Navy Audit Program. The Navy Audit Program focuses on two distinct types of audit—internal and contract. Internal audit is the independent appraisal of accounting, financial and related matters of an operating nature. It is concerned not only with detecting deficiencies which would be of interest to and external auditor—GAO, for instance—but also with providing management data it needs to improve the economy and effectiveness of operations. In short, internal audit is designed to provide management both protective and constructive services.

Title IV of the National Security Act 1949 amendments established offices of comptroller in the Department of Defense and in the Services, and established internal audit as a function of these offices. Within the DOD's Office of the Comptroller, there is an Assistant Comptroller for Audit. Within the Navy, the Comptroller is responsible for auditing; such functions being performed by the Navy's Auditor General.

Contract audit involves examining books and records of private contractors and verifying their cost representations insofar as Navy work is concerned. Contract audits also provide contracting officers with advice useful to them in negotiating contract prices. Both internal and contract audit are conducted under the Auditor General of the Navy.

SELECTED REFERENCES ON EXECUTION OF THE RDT&E BUDGET

DOD Directive 7250.5 "Reprogramming of Appropriated Funds," states DOD policy concerning reprogramming proposals and actions relating to the appropriation accounts covered by the Department of Defense Appropriations Act. This is the most fundamental DOD directive on reprogramming.

DOD Directive 7410.4 (NAVCOMPT MANUAL VOL V), "Industrial Fund Policy."

DOD Directive 7200.1 (NAVCOMPT MANUAL Vol II), "Administrative Control of Appropriations," prescribes regulations to prevent obligation in excess of apportionment and to fix responsibility for creating an obligation or expenditure in excess of an "appropriation, apportionment, reapportionment, or subdivision thereof."

SECNAV Instruction 7510.7, "Department of the Navy Audit Manual for Management," together with its enclosures, DOD Directive 7600.2, "Department of Defense Audit Policies," and DOD Instruction 7600.3, "Internal Audit in the Department of Defense," describes basic policies and responsibilities for Department of the Navy auditing.

NAVSO P-3062, Parts 1 and 2, "Financial Management of Resources—Research, Development, Test and Evaluation, Navy.

NOTE REGARDING DIRECTIVE NUMBERS

References to directives within this Guide are by series only; e.g., 3900.14, not to the effective edition within the series; e.g., 3900.14A

The "Master Reference List" indicates the version and issue date of each directive used in preparation of this edition of the Guide.

For recent information on the effective directive within a series, consult the "Department of the Navy Directives Issuance System: Consolidated Subject Index," (NAVPUBNOTE 5215).

Chapter 6
MANAGING ACQUISITION OF R&D EFFORT

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Chapter 6
MANAGING ACQUISITION OF R&D EFFORT

This chapter discusses the arrangements under which the Navy's R&D work is accomplished.

6.1 GENERAL CONSIDERATIONS

6.1.1 Fundamental Policy. In the acquisition of research and development, it is fundamental Department of the Navy policy to:

- Exploit the best scientific and technological sources to obtain the optimum balance in skills, quality, cost and schedule.
- Perform systems development only when the requirement cannot be met through use of Non-Development Items (see 6.1.2).
- Ensure maximum practical commonality in systems and equipment both within the Navy and among the Services.
- Encourage continuing competition with multiple sources performing concurrent but separate development up to Full Scale Development (FSD) and dual competing sources for production.
- Normally use "cost incentive sharing" contracts for development work. Risk will be reduced by controlling specifications and keeping program changes firmly under control.
- Continually strengthen the capability of the Government to competently plan and manage its R&D programs. Program Managers will be held accountable, will be longer term, and will be better trained (see 1.6.3 and 1.6.4). Government facilities must carry a reasonable part of Basic Research, and Exploratory and Advanced Development so as to be knowledgeable customers for later development by industry.

Ref.: SECNAV Instructions 4210.6 and 5000.2

6.1.2 Non-Development Items (NDI). NDI solutions to stated requirements must be pursued aggressively by each Program Manager throughout the acquisition process. Explicit consideration of NDI alternatives is required at all Milestone I, II, and III decision meetings, based on analysis and tradeoffs of performance, cost and schedule comparisons.

The Navy Specification Control Advocate General functions as the Department's NDI Advocate. He monitors NDI-related activities of the SYSCOMs and PMs, and reports to SECNAV on the effectiveness of Navy's NDI policy implementation.

Ref.: DOD Directive 5000.1; SECNAV Instruction 4210.7

6.1.3 Basic Roles. The acquisition process involves these essential roles in the User-Supplier dialogue and interaction (2.2.9):

- The "Technical Customer" (the User) is the official or organization having the requirement. This chapter is written from the perspective of the Technical Customer who is the manager arranging for the research and development effort.
- The "Performer" is the organization doing the work.
- The "Contracting Officer" has the basic responsibility for all contractual matters as described in the Federal Acquisition Regulation (FAR) and other regulations.
- The "User" in the User-Supplier relationship may be the Technical Customer alone (in an in-house acquisition), or be the team of the Technical Customer and the Contracting Officer (when acquisition is by contract).

6.1.4 Classes of Performers. Performers of R&D can be divided into two general classes, in-house and out-of-house, with several subcategories in each class.

6.1.4.1 In-house performers. Government-owned, Government-operated (GOGO) (for brevity, "laboratory" is used to refer to Navy R&D Centers, RDT&E Facilities, and laboratories) laboratories are the principal in-house performers. They account for approximately 30% of the Navy's R&D program.

In-house performance involves the least formal and time-consuming preliminaries. After an informal dialogue between the technical people on both sides, a general understanding is reached and the in-house equivalent of a contract is issued.

6.1.4.2 Out-of-house performers. They include:

- Commercial contractors account for the bulk of Engineering and Operational Systems Development and about 65% of the Navy's R&D program.
- Educational and other nonprofit institutions whose primary purpose is the conduct of scientific research are the primary performers of fundamental or basic research.
- Federal Contract Research Centers (FCRCs) operate like in-house laboratories but actually are contractor-operated facilities. The only current Navy FCRC is the Center for Naval Analyses, presently a part of the Hudson Institute.

6.1.5 Other Execution Means. There are several other means for executing Navy's R&D work in addition to in-house laboratories and contractors. Such work may be done by another Government agency—such as NASA, Army, Air Force, National Institutes for Standards and Technology, HHS, National Academy of Sciences, National Institutes of Health or the National Security Agency. Under our Military Assistance Program, promising foreign research programs may receive cost sharing or aid contributions which entitle Navy to share in results, reports and other data. NATO-coordinated production arrangements which aid weapons standardization of our allies may provide Navy data and production items.

6.1.6 Major Laboratory Functions. The role of the in-house laboratories spans the whole spectrum from research through operational support. While individual in-house laboratories have strong historical ties with individual Commands and Offices, the laboratories and "corporate assets" available to all R&D managers and decision makers requiring their capabilities.

6.1.6.1 Technology Base. The Navy's in-house laboratories possess most of Navy's scientific and technological expertise. This expertise is developed and maintained primarily through Research and Exploratory Development programs and is applied principally to advanced systems conceptions, weapon systems improvements, and resolution of fleet technology deficiencies.

Independent Research/Independent Exploratory Development (IR/IED) (see 6.2.5), plays a vital role in development of the Navy's Technology Base.

6.1.6.2 Advanced Development. The in-house laboratories also directly manage a large portion of Advanced Development, even though much of this work is performed by industry under contract. Laboratory responsibilities for these programs involve total program management, deputy project management or technical direction. The criteria for determining the scope of laboratory responsibility for Advanced Development relates to the labs involvement in the technology's development and in the concept of the system and to the availability of technical expertise.

6.1.6.3 Support for systems development. In-house laboratories also provide a wide range of services in support of major system developments. These services include (a) feasibility studies and other aspects of the concept formulation process, (b) development of plans such as the Acquisition Plan, the Integrated Logistics Support (ILS) plan, etc., (c) development of specifications, (d) provision of experts for the proposal evaluation and source selection process, (e) development of subsystems for which industry does not have adequate capability, (f) systems development for selected programs, and (g) test and evaluation. Thus the laboratories ensure that Navy can enter into contract negotiations as a knowledgeable buyer.

The laboratories also may help solve problems encountered during development.

6.1.6.4 Source of technical advice. The technical staffs of laboratories and other in-house organizations provide a source of advice and consultation available to all Department of the Navy R&D managers. Such in-house technical competence is essential to protect against the situation where outside technical advice becomes de facto technical decision making. The laboratories also provide technical representatives to ARBs, NPDMs and other forums for independent technical assessments of programs.

6.1.7 The In-House vs Contracting-Out Decision. In some cases, the decision to conduct a project in-house or to contract it out is far from easy.

Government policy for R&D and acquisition implementation calls for performance of R&D effort by the class of institution—Government laboratory, educational or nonprofit institution, private contractor—which can perform the work most effectively and efficiently, subject to certain qualifications. A series of actions to contract out important activities eventually could erode the Government's ability to manage its research and development programs.

It is essential that Government laboratories gain substantial experience in relevant technologies if they are to be effective in carrying out their roles in the weapons acquisition process.

Another important consideration is the time required to get a project underway. The administrative steps in providing funds and program direction to in-house laboratories are far simpler than those in awarding a contract. In addition, the in-house laboratories have teams of technical experts aware of the technical threat and knowledgeable of Navy problems and the operational environment.

6.2 PERFORMANCE BY IN-HOUSE ORGANIZATIONS

In-house organizations, particularly the in-house laboratories, constitute a base of scientific, technological and engineering knowledge, and talent tailored to the Navy's needs. This section discusses the kinds of tasks in-house organizations do best and describes processes for arranging, monitoring and funding such work.

6.2.1 Identifying Laboratory Capability. Identifying the laboratories, or other in-house organizations, with the capabilities to meet a particular need is not difficult.

Appendix G identifies DON laboratories and R&D centers and provides brief statements of their missions. The three-volume RDT&E Center Management Briefs contain information on

missions, facilities, programs, major accomplishments, organization, personnel, funds and responsibility of each RDT&E activity.

Another approach to identifying in-house DON capabilities is to request the Defense Technical Information Center to search its abstracts (DD 1498, "Research and Technology Work Unit Summary") to identify work most closely related to the technical need (see D3.1.1). The Technical Customer can then contact either the sponsor of the work or the Principal Investigator.

Ref.: NAVAIR Instruction 5451.87; RDT&E Center Management Briefs

6.2.2 Negotiating with Laboratories. When an in-house Laboratory is selected to perform a task, the process of "negotiating the contract" is relatively simple (see 6.1.4.1). The basic agreement is development through informal negotiations. Once agreement has been reached, the proposed work is incorporated into the laboratory program and reported in the DOD Work Unit Information System (DD 1498). To fund the proposal or to modify it, the customer prepares a task assignment for the laboratory by letter or in a format specified by the individual Systems Command. Necessary funding documents are forwarded to the activity in support of the task assignment.

The above documentation, essentially contractual in nature, provides statements of the work to be done, milestones, cost estimates, and funding.

6.2.3 Funding. Navy's major RDT&E activities operate under the Navy Industrial Fund (5.3.4.1). When a DOD agency orders RDT&E work or services from a NIF facility, a Work Request (NAVCOMPT form 2276A) is used. Funds to support work requests are obligated by the customer upon acceptance of the work by the NIF activity

For RDT&E activities not operating under NIF, the management command issues an annual operating budget (5.3.4.2). This budget does not obligate the funds of the management command. Customers outside the management command may order work from these activities by using a work request. Acceptance of the document by the activity obligates the customer's funds.

6.2.4 "Contracting" with In-House Laboratories. Work requests fund an agreement with a laboratory or other in-house organization to perform a task. When placed with and accepted by the laboratory, the work request obligates funds in the same manner as a contract with a commercial concern. While the work request includes a brief technical description of the work, it is normally supplemented by an amplifying letter or task assignment document.

Ref.: DOD Directive 7410.4;

6.2.5 Navy Laboratories IR/IED Program. Under the IR/IED (Independent Research/ Independent Exploratory Development) Program, administered by the Office of the Chief of Naval Research (OCNR), funding is provided to each laboratory for projects initiated and managed by the laboratory. The principal objective of the IR/IED Program is to capitalize immediately (i.e., outside the normal budget cycle and process) on in-house generated ideas for solution to Navy and Marine Corps problems.

6.3 PERFORMANCE BY OUT-OF-HOUSE ORGANIZATIONS

The process of executing a major program through contracting with industry is somewhat more formalized and complex.

6.3.1 Federal Acquisition Regulation. The Federal Acquisition Regulation (FAR) is the government-wide acquisition regulation contain-

ing policies, procedures, contract clauses and forms. Part 35 relates to R&D. The FAR replaced the DAR (Defense Acquisition Regulation), formerly ASPR (Armed Services Procurement Regulation), in April 1984.

The FAR is supplemented by the DOD FAR Supplement (DFARS) and the Navy Acquisition Regulation Supplement (NARSUP). Readers consulting FAR citations should consult corresponding sections in DFARS/NARSUP for complete information.

6.3.2 Necessity for Visible Propriety. Contracting by the Navy is public business and must be conducted with scrupulous regard for the rights of all competitors. Competitors have the right by law to be informed of the outcome of contracts, the basis of the award and the specific grounds for non-selection. This information legally must be maintained by the Navy and be available for review.

Prenegotiation and postnegotiation Business Clearance requirements prescribed in Navy Acquisition Regulation Supplement (NARSUP 1.690) must be fulfilled on each contract action.

Ref.: FAR 4.801; NARSUP 1.690

6.3.3 Role of Small Business. It is the policy of the Department of Defense to place a fair proportion of its total contracts for research and development supplies and services with small business concerns qualified to participate in Navy's programs.

Ref.: FAR 19.201 and 35.004(a); DFARS 4.671-5(d)(3), Navy Small and Disadvantaged Business Personnel Directory (NAVSO P-2485) provides contact points for small businessmen concerning laboratories and other technical organizations

6.3.4 The Importance of Competition. Part 6 of the FAR deals with competition requirements in government contracting. Current law requires, with certain exceptions, that contracting officers use "full and open competition" in soliciting offers and awarding contracts. The competitive procedures involve: (a) sealed bids, (b) competitive proposals, (c) combination of competitive procedures and (d) other competitive procedures. Since research and development contracting generally is not suited to sealed bidding or combination procedures involving sealed bidding, competitive R&D contracts usually evolve from "competitive proposals" or "other competitive" procedures.

The "competitive proposal" procedure involves issuance of a Request for Proposals (RFP) (see 6.6.2). The "other competitive" procedure is used only for research and that development effort not related to specific system or hardware procurements, and involves a broad agency announcement.

It is important that competition primarily be based on performance, validated by testing and evaluation. DON policy, set forth in SECNAV Instruction 4210.6, states that

> The development cycle of each program will begin with a minimum of two contracts/ contractor teams performing concurrent but separate development up to the Full Scale Development Phase (FSD), at which time it will normally be narrowed to two contractors developing a system to one design.

The FSD contractors usually will then compete for annual production purchases, or "buys".

Despite the competition imperative, situations occasionally arise in R&D contracting where competition is not possible. FAR 6.302 identifies circumstances which permit other than full and open competition. Of these, three can pertain to R&D:

- Only one responsible source
- Unusual and compelling urgency
- Experimental, developmental or research work

Exceptions require written justifications and approvals (commonly called "J&A's"), which are prepared jointly by technical personnel and the Contracting Officer. Details on the requirements, content, approval, and availability of justifications are provided in FAR 6.303.

The Competition Advocate General is responsible for ensuring maximum effective, sustainable competition in Navy programs.

Ref.: 10 U.S.C. 2304; 41 U.S.C. 253; FAR Part 6; SECNAV Instruction 4210.6, 4210.10

6.3.5 Overview of Major Development Programs. A major program involves many tasks executed under a large number of different contracts and task orders. Although in-house laboratories seldom act as prime contractors on development contracts, they participate in most major programs.

For example, a major program such as a new fighter aircraft, in addition to the prime contract, will involve a number of industrial contracts for both hardware and software. Hardware contracts cover various items of Government furnished equipment (GFE). Engineering services and technical assistance may be provided under contract. In-house laboratories will be heavily involved in system definition, specifications preparation, proposal evaluation, performance monitoring, and in providing technical assistance. Major tasks, such as development of a brass-board model under Advanced Development, may be assigned to a laboratory, which in turn may contract all or portions of the work to an outside company.

6.3.6 Execution Functions. The following functions are basic to the executions of all R&D effort:

- Acquiring an adequate base of performer candidates.
- Selecting the best qualified participants.
- Establishing performance agreements.
- Conveying Government-furnished inputs.
- Performing the contract.
- Monitoring and reporting contract performance.
- Compensating performers.

6.3.7 Acquisition Plan. An Acquisition Plan (AP) is required when estimated development costs are $2 million or more, or when annual production or services costs are $5 million or more or $15 million or more overall.

The AP is the principal document for in-depth program review and oversight by the Navy Secretariat (see 1.4.8.1). APs meeting the criteria of NARSUP 7.103 must be approved by use of a Program Endorsement Memorandum (PEM). Criteria for development are total contract cost in excess of $5M for NAVAIR and NAVSEA, and in excess of $2M for all other activities. In general, neither a formal solicitation nor a Commerce Business Daily synopsis may be issued prior to signing of the PEM.

The AP is prepared at the time the Principal Developing Activity (PDA) is assigned, and it is submitted for approval no later than the time the item first appears in the FYDP. The Program Manager is responsible for the AP. APs are reviewed annually and updated when major changes occur or upon transition from one development phase to another.

Acquisition Plans include funding, methods of contracting, source selection, contract type, competition, cost, delivery, Government-furnished equipment and information, milestones, future requirements, and contract administration. The Acquisition Plan begins as a broad outline and is expanded and refined as the program progresses.

Ref.: DFARS 7.1; NARSUP 7.1

6.3.7.1 Non-Development Items (NDI) in the AP. It is DON policy that the use of NDI becomes the rule rather than the exception. APs must describe the extent to which NDI are planned for the proposed acquisitions, and justify where NDI are not feasible or cost effective.

Ref.: SECNAV Instruction 4210.7

6.3.8 Accelerated Development Procedures. To meet urgent needs for new systems or components, procedures have been established for relaxation of planning documentation requirements and acceleration of the funding and contracting processes. In such cases, although planning documentation still is required, its preparation proceeds parallel with development of the hardware. Such accelerated development is conducted under Rapid Development Capability procedures.

Ref.: SECNAV Instruction 3900.37; OPNAV Instruction 3900.22

6.4 CONTRACTING TECHNICAL ASSISTANCE

There are several major sources of technical assistance available to assist in the acquisition process.

6.4.1 The Acquisition Team. A complex acquisition requires not only the closest operation between the Technical Customer and the Contracting Officer, but also the assistance of a large number of specialists. These include legal and patent counsel, scientists and engineers knowledgeable in critical fields of technology, experts in integrated logistic support, etc. Where the Technical Customer's own organization does not have the necessary skills available, such generally can be acquired from the laboratories.

6.4.2 Contract Activities. Commands, Offices and many laboratories have contracts groups or contracts directorates which legally are responsible for all contracting activities, and provide staff advice and consultation to the Technical Customer. Generally, such assistance is available to meet the needs of acquisition planning and development of the procurement request (PR) long before actual contracting action begins.

6.5 GRANTS, CONTRACTS AND OTHER ACQUISITION INSTRUMENTS

6.5.1 Grants. The Department of Defense legally is permitted to use grants in support of basic research. Within the Department of the Navy, the Office of Naval Research has the authority to issue grants.

6.5.2 Contracts. A contract is an offer and acceptance backed by legal considerations. Types of contracts normally used to support RDT&E effort include:

Ref.: FAR Part 16; 35.006

6.5.2.1 Cost-sharing contract. Under a cost-sharing agreement the contractor is reimbursed for an agreed portion of his allowable costs, not to exceed an established ceiling. No fee is paid.

6.5.2.2 Cost contract. A cost contact involves payment of all allowable costs involved in executing a given research project. The contractor receives no fee. This type of contract establishes an estimate of the total cost for obligating current funds and establishes a ceiling beyond which the contractor cannot go (except at his own risk) without prior approval.

6.5.2.3 Cost-plus-fixed-fee contract. The cost-plus-fixed-fee contract is similar to the cost

contract in that it provides for payment of all allowable costs and establishes an estimate of the total cost. In addition, however, it provides for payment of a fixed fee based on the nature of the work and on other factors as stated in FAR 16.306.

6.5.2.4 Cost-plus-incentive-fee contract. The cost-plus-incentive-fee contract is a cost-reimbursement-type agreement with provision for a fee which is adjusted by formula in accordance with the relationship of total allowable costs to target cost. Under this type of contract, there is negotiated initially a target cost, a target fee, a minimum and maximum fee and a fee adjustment formula. Factors other than cost, such as a performance and schedule, also can be used for contract incentives.

Ref.: FAR 16.3

6.5.2.5 Fixed-price-incentive contract. The fixed-price-incentive contract is a fixed-price-type contract with provision for adjustment of profit and establishment of the final contract price by a formula based on the relationship of final negotiated total cost to target costs. Under this type of incentive contract a target cost, a target profit, a price ceiling (but not a profit ceiling or floor), and a formula for establishing final profit and price are negotiated at the outset.

6.5.2.6 Firm-fixed-price contract. The firm-fixed-price contract provides for a price which is not subject to any adjustment by reason of the contractor's cost experience in performing the work. This type of contract places maximum risk with the contractor. Because the contractor assumes full responsibility, in the form of profit or losses for all costs under or over the firm fixed price, he has a maximum profit incentive for effective cost control and contract performance. "The firm-fixed-price contract is suitable when definite design or performance specifications are available and whenever fair and reasonable prices can be established at the outset, or for level-of-effort work.

6.5.2.7 Purchase order. An individual purchase order, DD Form 1155, may be used for fixed-price purchases under $25,000.

6.5.2.8 Letter Contract. A letter contract is a preliminary agreement which authorizes immediate start of work. Letter contracts are used only when a definitive contract cannot be negotiated and awarded soon enough to meet acquisition needs. Letter contracts are the least desirable contracting approach. DOD and Navy policy limits their use.

Ref.: FAR 16.603; DFARS/NARSUP 17.5

6.5.3 Specifications. Specifications are clear and accurate descriptions of technical and other requirements established for supplies or services being procured. They also may spell out procedures for determining whether such requirements have been met. Requirements are sometimes defined by the work statement (see 6.5.4) or a "purchase description" when it is impractical or uneconomical to prepare a specification.

Acquisition streamlining (see 2.5.1.8) is an important DON initiative. The Specification Control Advocate General is responsible for reviewing development specifications and tailoring them to operational requirements.

There are two general types of specifications: *Function or performance specifications* define the end results, or capabilities sought, leaving how to achieve those results up to the performer. *Design specifications* prescribe *how* the results are to be achieved. Function or performance specifications are preferred when practicable.

Items for which there is a repetitive demand are described by Federal or Military specifications. Federal specifications cover items used by two or

more Federal agencies. Military specifications cover items used primarily by the military departments. These are identified by a three-part symbol beginning with MIL. For example, MIL-H-8775 covers "Hydraulic Systems, Components, Aircraft."

Standard specifications, which often are quite voluminous, usually are noted in contracts only by reference.

Formal specifications are available in two listings: the Index of Federal Specifications, Standards and Handbooks, and the military Department of Defense Index of Specifications and Standards (DODISS). Both may be purchased from the U.S. Government Printing Office.

6.5.4 The Work Statement. The work statement is that portion of a contract describing the work to be done. While most other contract clauses primarily are the responsibility of the Contracting Officer, the work statement is of vital concern to the Technical Customer. Ideally, the work statement as set forth in the Procurement Request (6.6.1) will be suitable for use as the contract work statement. The Procurement Request is prepared by the Technical Customer.

The following elements are considered in preparing the work statement:

- The required objectives and desired results.
- Background information on the requirements and how they evolved.
- Elimination of performance requirements which yield only marginal military worth when compared to cost and/or risk, as certified by CNO/CMC.
- Maximum practical commonality (certifiable by the Program Executive Officer (see 1.4.8.2).
- Technical considerations such as known specific phenomena or techniques.
- Personnel and environmental factors.
- A detailed description of the technical requirements and subordinate tasks.
- A description of reporting requirements and any other deliverable items, including data, experimental hardware, mockups and prototypes.
- Type of contract.
- Other special considerations, including streamlining and tailoring.

Ref.: FAR 35.005(d); SECNAV Instruction 4210.6

6.5.5 Other Contract Provisions. Federal law and DOD and Service regulations require the inclusion of a variety of specific clauses in contracts. A number of these depend on the type of contract and contractor. Others are special contract requirements suited to the particular contract action. The majority of these clauses are drafted by the Contracting Officer with little or no direct input from the Technical Customer. The following, however, are clauses of concern to the Technical Customer since they affect development and exploitation of technology.

6.5.5.1 Patent rights. Contracts relating to experimental, developmental or research work are required by FAR to include a patent rights clause. This clause defines the rights and obligations of the contracting parties regarding inventions that are conceived or first reduced to practice in the course of the contract. Such contracts require clauses permitting the Government to make contract results available to other agencies and to the private sector, consistent with national security and data rights as specified in the contract.

Ref.: FAR 27.2, 27.3

6.5.5.2 Data acquisition and data rights. All R&D contracts carefully must specify the data to be delivered. In planning a developmental

acquisition, particularly when subsequent production contracts are contemplated, consideration should be given to the need and time required for obtaining the procurement package. The "procurement package" includes specific plans, drawings, specifications and other descriptive information necessary to achieve effective competition in production contracts.

Contracts in which the Government acquires technical data and computer software must identify the software and technical data requirements and must contain a "rights in computer software and technical data clause." The contract's computer software and technical data requirements appear in the "Contractor Data Requirements List" (DD Form 1423), and set forth the technical data and computer software that are required to be furnished by a contractor. The "computer software and data clause" is a special contract clause defining the rights and obligations of the contracting parties with respect to such data and software, and particularly the Government's right to use them.

Even though acquisition, maintenance and updating of computer software and data is an expensive process, it is general policy to acquire rather than than lease computer software and technical data necessary to meet needs of the overall acquisition strategy (see 2.5.1.2). This strategy often requires acquisition of sufficient data to promote future competition.

Ref.: FAR 35.011; DFAR 27.4

6.5.5.3 Independent Research & Development (IR&D). The FAR permits Defense contractors to charge an allocable share of their research and development costs as overhead on Defense contracts. The amounts to be allowed for allocation are controlled by negotiated advance agreements between the DOD and the contractor. The combined total ceiling for the IR&D and the Bid and Proposal (B&P) costs are interchangeable. The work is reviewed for technical merit and its potential relationship to military functions or operations in accordance with statutory requirements. Defense contract IR&D reimbursement may not exceed costs or work deemed to have a potential military relationship. Work performed under this IR&D provision has played a vital role in developing the technical base for future systems.

Ref.: DOD Instruction 3204.1; SECNAV Instruction 3900.40; FAR 31.205-18

6.5.6 Contracting for the Technology Base and Advanced Technology. Research and that development effort not related to specific system and hardware procurements involve extending knowledge of nature's laws and of their useful applications. Since the results of such efforts normally cannot be foreseen, contracts for this work often call for the delivery of a *specified level of effort* rather than the achievement of a specified result (see 6.5.2 on types of contracts).

Ref.: FAR 35.005(a), (b), (c)

6.5.6.1 Full disclosure policy. As noted earlier, R&D contracts are required to contain a clause permitting the Government to make contract results available to other Government agencies and the private sector, consistent with national security and data rights specified in the contract.

Ref.: FAR 35.010

6.5.6.2 Government equipment for universities and other nonprofit institutions. The Navy encourages education and nonprofit institutions to maintain a high level of effort in basic

technologies to enhance our long-range scientific knowledge. Under the Short Form Research Contract (DFARS Part 35, Subpart 35.70), title to property approved for purchase with contract funds is vested automatically in the universities or nonprofit institutions, with few exceptions.

Also, when the Government has property which is excess to its needs and which has been identified as "surplus," title may be transferred to educational and nonprofit institutions in accordance with existent disposal regulations.

Ref.: DOD Directive 3210.2

6.6 SOLICITING R&D COMPETITIVE BIDS AND PROPOSALS

Full and open competition is widely used in acquiring R&D. One technique is "competitive proposals" (see 6.3.4) and another is Broad Agency Announcements (BAA's) (see 6.6.6). The key elements in the competitive proposals process are as follow:

6.6.1 Procurement Request. The Procurement Request (PR) is prepared by the Technical Customer to initiate the contracting process. This document provides a complete and technically adequate statement of what is required, which is used first in the solicitation document (RFP/RFQ) (see 6.6.2), and later in the contract work statement (see 6.5.4). Assistance generally is available from the contracts group to help the Technical Customer in its preparation.

The PR is coordinated and reviewed extensively before approval for initiation of the contract action since it is the basis for the commitment of funds. It certifies that the necessary funds are available and have been reserved for the proposed contract.

6.6.2 Solicitation Documents. The solicitation document advises prospective performers of Government needs. It takes the form either of a Request for Proposals (RFP) or a Request for Quotation (RFQ). The RFQ is used when bilateral negotiation will be conducted before a binding contract will exist. In the RFP, the Government reserves the option to award the contract on the basis of the proposal without further negotiation. Responsibility for preparing the RFP or the RFQ, which is part of the "bid package," rests with the Contracting Officer.

The technical heart of the solicitation document is the prospective work statement which provides the potential contractor a comprehensive understanding of technical factors, criteria, and/or problems which should be considered in preparing the proposal, and which the Government will use in proposal evaluation. This part of the PR must be comprehensive and clear to ensure that all contractors solicited have a common understanding of the requirement and the proposed method of evaluation.

6.6.3 Promulgation of Solicitation Documents. The RFP or the RFQ is sent to all organizations known to have the requisite capabilities. Bidders Mailing Lists are maintained by the purchasing activities. In addition, the Technical Customer indicates in the PR the organizations known to have the technical capabilities required to carry out the work.

Since proposals may be both costly and wasteful of scientific and engineering manpower, FAR 35.007(a) limits initial solicitation to sources judged to have the basic technical qualifications to perform research or development in the specified field. The solicitation also is given public notice in the Commerce Business Daily, a Department of Commerce publication. Firms learning of the solicitation through the Commerce Daily may request an RFP or RFQ.

A pre-solicitation conference may be held with potential contractors prior to promulgation of the solicitation document to clarify questions concerning the proposed contract and to elicit the interest of prospective contractors.

The information in the solicitation may be supplemented by a "pre-proposal conference."

This is a meeting of prospective offerors arranged by the Contracting Officer to answer questions of prospective offerors and assist them in understanding the Government's requirements.

Ref.: FAR Part 5, 15.409, 35.004, 35.007(a) and (b)

6.6.4 Evaluating Proposals and Bidders. Evaluation leading to selection of the performer involves the evaluation of proposals and a number of other factors affecting the ability to perform. While most of the "other factors" fall within the province of the Contracting Officer, the Technical Customer will play a major role in judging the capability of the bidders to successfully perform the technical work.

In determining the capability of prospective contractors, the following are considered:

- The contractor's understanding of the scope of the work as shown by the technical approach proposed.
- The availability and competence of experienced engineering, scientific and other technical personnel.
- The contractor's financial stability.
- Management background, procedures and facilities to assure security of documents, designs and other restricted data.
- The availability of necessary research, test and production facilities and the contractor's willingness to invest in production tooling and test equipment.
- Experience or pertinent innovative ideas in the applicable branch of science or technology.
- The contractor's willingness to devote his resources to the proposed work with appropriate diligence.
- The contractor's management capabilities, quality and cost controls, and record of past performance.

Ref.: DOD Directive 4105.62 (SECNAV 4200.33); SECNAV Instructions 4200.33; 4210.6; FAR 35.008; NARSUP 15.804-3

6.6.5 Source Selection. The basis for the award of Defense contracts is the same, regardless of the method of acquisition, type of contract or nature of work. The overriding aim is a contract and contractor most advantageous to the government and confidence that the work will achieve desired objectives. FAR makes it clear that in awarding R&D contracts, the basic policy is to favor organizations including educational institutions, that propose the best ideas or concepts and have the highest competence in applicable fields of science or technology (see FAR 35.008(a)). Cost must be taken into consideration, not only to determine reasonableness, but also to determine understanding of the project, perception of risks, and ability to organize and perform the work. When a cost/benefit approach is used, cost must carry a weight of not less than 40% unless otherwise thoroughly justified. Where adequate price competition is expected, the contracting officer shall not require submission of cost or pricing data (see FAR 35.008(e)).

Ref.: DOD Directives 4105.62 (SECNAV 4200.33); SECNAV Instruction 4200.33; FAR 35.008; NARSUP 15.605

6.6.6 The Broad Agency Announcement. A full and open competitive technique, used for research and that development effort not related to specific system or hardware procurements is the Broad Agency Announcement (BAA) described under "Other Competitive Procedures" in FAR 6.102(d)(2). This announcement identifies areas of broad research interest, lists criteria to be used in

the selection process and solicits proposals from capable contractors.

BAA differs from the "competitive proposal" process in that there is not a work statement but only an announcement of general research interest. Proposals submitted in these general areas may vary widely and, as provided in the BAA, may be submitted either by a common date or any time during the announcement period. Proposals are not necessarily evaluated against each other, but are selected on the basis of individual scientific merit. Proposals receive scientific review, and the resulting awards are counted as full and open competition.

6.7 MANAGEMENT ACTIVITIES DURING EXECUTION

Subsequent to the contract award, the execution of the work involves a number of control, status and management reports.

6.7.1 Management Control Systems. The contractor is responsible for timely and satisfactory performance of his contract. However, the Government also monitors his performance to ensure that the desired results are accomplished as scheduled.

Management control information is generated from data used by the contractor's operating personnel, and provided to meet successively higher level management and monitoring requirements. Contractor management information and program control systems and reports should be used as much as practicable. Government imposed changes to contractor systems should be limited to those necessary to satisfy established DOD-wide standards.

Management control system and/or reporting requirements which can be contractually imposed are limited to those systems described in the "Acquisition Management Systems and Data Requirements Control List (AMSDL)." (DOD Manual 7000.6M)

The Manual has two listings: general application for use throughout DOD, and restricted application with various use constraints. The Manual also advises the user how to select management systems from the lists to be included on the solicitation document and then, after contractor response, how to "tailor" requirements to meet the particular needs of a specific contract.

Requirements for DOD-imposed acquisition management systems must be specified in the RFP and contract. These requirements must be included in the planning documents, solicitations and final contract. This list indicates possible "tailoring," provides a cross reference to sections of the contract where the "tailoring" is described, and, for deliverable data, cites appropriate Data Item Descriptions (DIDs) contained in the "Contract Data Requirements List," DD Form 1423. In other words, constraints exist upon Navy acquisition managers both in the management systems that may be imposed and on data the contractor may be required to submit based on such systems.

The intent of the policies is to keep cost of monitoring and reporting to the minimum by limiting management control systems to those essential to fulfilling Government needs.

"Performance Measurement for Selected Acquisitions," DOD Instruction 7000.2, requires, for certain major acquisition programs, evaluation of a contractor's management control system and demonstration of the internal systems against criteria contained in DOD Instruction 7000.2 and the Joint Service Publication, Cost/Schedule Control Systems Criteria (C/SCSC) Joint Implementation Guide, OASN(S&L) Pamphlet P3627.

Ref.: DOD Directive 7750.5; DOD Instruction 7000.2 (SECNAV 7000.17); SECNAV Instruction 7000.17; DOD 7000.6M Acquisition Management Systems and Data Requirements Control List (AMSDL); OASN(S&L) pamphlet P3627, Cost/Schedule Control Systems

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6.7.2 Technical Reports. Scientific and technical reports are written for the permanent record to document results of R&D effort. A completed "Report Documentation Page," DD Form 1473, must be included in each copy of a scientific or technical report required by the contract. Copies of all technical reports are furnished to the Defense Technical Information Center (DTIC). (See Appendix D for additional information on DTIC).

DOD Directive 5230.24; SECNAV Instruction 3900.29; MIL-STD-847A (SECNAV Instruction 3900.29); FAR 35.010(b); DFARS 35.010

6.7.3 Progress Reports. Standard contract provisions require the contractor to submit reports on the status and results of all work. The contract defines a detailed reporting policy, and monthly reports in the form of letters often are required. *Information submitted includes:*

- The number and names of key personnel working on the project.
- Facilities used.
- Direction of the work, and present and anticipated problems.
- Experiments being conducted.
- The latest work done—scientific data, observations, predictions and plans.
- Financial information.

6.7.4 Cost Reports. Three systems of cost reporting are available, each addresses specific need and user. For all three systems, costs are reported against the standard work breakdown structures (WBS) prescribed in MIL-STD-881. (See C11).

6.7.4.1 Cost Performance Report. The Cost Performance Report (CPR) provides the Program Manager a means of collecting summary level cost and schedule performance data. It is applicable to selected contracts within certain major system acquisition programs. It is not required on firm fixed price contracts unless they involve major systems or components, and circumstances require cost/schedule visibility.

Ref.: DOD Instruction 7000.10 (SECNAV 7000.15); SECNAV Instruction 7000.15

6.7.4.2 Contractor Cost Data Reporting. Contractor Cost Data Reporting (CCDR) provides a consistent, uniform historical cost data base for:

- Preparing independent cost estimates for major weapon systems acquisitions to be reviewed by the Defense Acquisition Board (DAB).
- Developing cost estimates in support of analysis and contract negotiations.
- Tracking contractor's negotiated costs.

Through the use of standard definitions, standard WBS, uniform reporting and a cost exchange system, the information collected provides a common data base for cost estimating within the DOD. CCDR is mandatory for all new major programs and acquisitions.

Ref.: DOD Directive 7000.11 (SECNAV 7000.20); SECNAV Instruction 7000.20; NAVMAT P-5241, Contractor Cost Data Reporting (CCDR)

6.7.4.3 Contract Funds Status Report. The Contract Funds Status Report (CFSR) supplies funding data that, along with other performance measurement inputs, provide DOD with information to assist in:

- Updating and forecasting contract fund requirements.
- Planning and decision-making on funding changes.

- Developing fund requirements and budget estimates in support of approved programs.
- Determining available funds in excess of contract needs.

CFSR is an optional procedure and normally applies to all contracts of over $500,000.

Ref.: DOD Instruction 7000.10 (SECNAV 7000.15); SECNAV Instruction 7000.15

6.7.5 Administration of Contracts. Responsibility for administration of contracts usually is delegated to contract administration offices upon contract award. These offices include those established by the Defense Contract Administration Service (DCAS) of the DOD Defense Logistics Agency, and those established by the Navy under the DOD Plant Cognizance Program.

The services these offices provide include contract administration, production and quality assurance, data and financial management activities (and administration of the industrial security program) and contract compliance. They also provide access to small business/labor surplus area firms.

The Project Manager of a major project or of one meeting DOD Directive 5000.1 value thresholds is required to have representation at or near the contractor's site. This representation may be technical representatives assigned to existing DCAS offices or to Contract Administration Offices of other Services.

The handbook, DOD Directory of Contract Administration Services Components (DOD 4109.59-H) identifies DOD organizations performing contract administration services.

Ref.: DOD 4105.59-H; DOD Instruction 4105.64

6.7.6 Selected Acquisition Report. The Selected Acquisition Report (SAR) is a standard, comprehensive, summary status report on major programs. The report's data meets the requirements of DOD management as well as the needs of Congressional review. Technical, schedule, and program cost sections are the heart of the SAR. These sections compare current estimates with the planning and development estimates in the approved DCP. Reasons for variance are required and demonstrated performance must be reported in the technical section.

SARs normally are prepared only for projects designated by the SECDEF as major programs although others may be specifically selected by SECDEC for such treatment. SARs are prepared by the Program Manager for submission through the SECNAV to the Secretary of Defense. SECDEF then forwards selected reports as requested to the Senate and House Armed Services and Appropriations Committees for information. The General Accounting Office also receives copies of the SARs.

Ref.: DOD Instruction 7000.3 (SECNAV 7700.5); SECNAV Instruction 7700.5

6.7.7 Other Reports. Several other reports are submitted by the Technical Customer.

6.7.7.1 Research and Technology Work Unit Summary. The R&T Work Unit Summary (DD Form 1498) is used to report ongoing effort at the work unit level. Work unit summaries are updated annually, or more frequently as significant changes occur.

Ref.: DOD Regulation 3200.12-R-1; SECNAV Instruction 3900.32

6.7.7.2 RDT&E project listings. RDT&E project listings were discussed in Chapter 4 (see

4.2), "Preparation and Justification of the Budget." Project listings are prepared during each year to support the May POM submission to OSD; the July budget submission to the Navy Comptroller; the September budget submission to OSD/OMB; and in December to reflect the President's budget. An additional listing is prepared by OCNR Comptroller in May in support of the RDT&E Apportionment Requests.

6.7.7.3 Reporting by laboratories/centers. Reporting by the laboratories and centers consists of inputs to the DOD Work Unit Information System (DD Form 1498) and project and financial status reporting as agreed to between the laboratory/center and the customer.

6.7.8 Changes and Amendments to Contracts. Contract modifications, as defined by FAR 43.101, means any written change in the terms of a contract. Changes must be accomplished by the Contracting Officer.

6.8 EXECUTION OF MARINE CORPS R&D

Ref.: MCO P5000.10, 5000.15

6.8.1 Execution Approaches. Acquisition of R&D to meet Marine Corps needs is accomplished in a number of ways:

- By direct acquisition from a contractor or another Service.
- By transferring funds to another Service and "buying" a percentage of the management of a development program which the other Service conducts.
- By officially indicating interest in a development program which is totally funded by another service.
- By participation in a Joint Service Program.

The primary consideration determining the acquisition approach is whether the end product is required by the landing forces in amphibious or expeditionary operations. If so, the development is a Marine Corps responsibility and will be funded and controlled by the Marine Corps, either directly by procurement or a contractor's services or indirectly by transferring funds to another Service. If the end product is not peculiar to the needs of the landing forces, another Service will be formally requested to initiate, or modify, a development program to satisfy requirements of both the Marine Corps and the sponsoring Service.

6.8.2 Program Cognizance within HQMC. Responsibility within Headquarters Marine Corps (HQMC) during the execution of R&D and acquisition lies with the Office of the Commanding General, MCRDAC which coordinates and integrates the conduct of implementing actions. Additionally, the CG,MCRDAC serves as the point of contact for R&D and acquisition matters between HQMC and agencies external to the Headquarters.

6.8.3 Management of Acquisition. The total development effort managed by the Marine Corps greatly exceeds the amount supported with Marine Corps RDT&E funds. For example, a program totally funded by the Army can be as vital to future Marine Corps capability as a program financed by the Marine Corps. The Marine Corps devotes as much management attention to the former as to the latter.

6.8.4 Role of Marine Corps Research, Development, and Acquisition Command (MCRDAC). MCRDAC is the primary field agency for the management of developmental efforts conducted on behalf of the Marine Corps. When such efforts are funded and controlled by the Marine Corps in execution of the Commandant's responsibility for the development of landing force weapons and equipments, or when the end product is being developed to satisfy a Marine-Corps-peculiar requirement, MCRDAC's management role is active. When such efforts are

conducted by another Service to satisfy requirements of both the Marine Corps and the sponsoring Service, MCRDAC's management role principally involves monitoring developmental efforts to ensure that Marine Corps requirements are satisfied and that any Marine Corps funds invested are appropriately utilized.

6.8.5 Role of the Navy Laboratories. Navy laboratory support of Marine Corps R&D includes:

- Assisting in developing and updating the Marine Corps Long-Range and Mid-Range Objective Plan, and the material objectives that flow from them.
- Identifying the development efforts (exploratory, advanced, engineering) and the technical requirements necessary to attain them.
- Formulating (in conjunction with MCRDAC) tentative development programs to implement Marine Corps requirements.
- Providing technical management of programs approved and funded to meet USMC requirements or the monitoring and providing of scientific/technical guidance on programs concerned with Marine Corps requirements but conducted by other Services.

6.9 PROGRAM MANAGEMENT

The Program Manager (PM) is responsible to his Program Executive Officer (PEO) (see 1.4.7.2), and is directly accountable for the successful implementation of his approved program.

PMs are responsible for ensuring that the program schedule and funding are consistent with the acquisition policies established in SECNAV Instruction 4210.6 from inception through completion. These elements of program management are to be adjusted as necessary throughout the acquisition cycle. Such adjustments shall be reflected in documents included in the PPBS process, decision-milestone process (i.e., ARBs, NPDM/MCPDM, DABs), in the AP, and in the PMP process.

Changes in approved programs must be firmly controlled. Changes in baseline schedule, configuration, performance characteristics, or acquisition strategy which will increase funding requirements must be presented for review in accordance with the PMP process (See 3.4.21).

Ref.: SECNAV Instructions 4210.6, 5000.33, 5420.188

SELECTED REFERENCES ON CONTRACTING AND EXECUTION OF R&D PROGRAMS

Federal Acquisition Regulation (FAR), Part 35, "Research and Development Contracting." (See 6.3.1)

DOD Directive 4105.62, "Selection of Contractual Sources for Major Defense Systems."

DOD Instruction 7000.3 (SECNAV 7700.5), "Selected Acquisition Reports."

SECNAV Instruction 3900.37, "Rapid Development Capability for Warfare Systems; Establishment of."

SECNAV Instruction 4200.33, "Selection of Contractual Sources for Department of the Navy Defense Systems."

SECNAV Instruction 4210.6, "Acquisition Policy."

SECNAV Instruction 4210.7, "Effective Acquisition of Navy Material," discusses the NDI policy.

Chapter 7
TEST AND EVALUATION

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Chapter 7
TEST AND EVALUATION

Test and evaluation are the culminating steps in the R&D process. That data developed in the test and evaluation phases of the RDT&E activity are the bases for decisions as to whether or not the program should advance into production and achieve Initial Operational Capability.

Navy research and development are discussed from the viewpoint of test and evaluation: policies, types of tests, facilities and resources, planning, execution, and utilization of results of test and evaluation (T&E).

7.1 GENERAL BACKGROUND

This section, which provides a general frame of reference for the rest of the chapter, covers the nature and purpose of test and evaluation and basic policy on T&E.

7.1.1 Nature of Test and Evaluation. While the terms "test" and "evaluation" most often are found together, they actually denote clearly distinguishable functions in the R&D process. "Test" is the examination of hardware/ software—models, prototypes, production equipment, computer programs—to obtain data, necessary to develop new capabilities, manage the process, or make decisions on resource allocation. "Evaluation" is the process in which data are logically assembled and analyzed to aid in making systematic decisions.

Test and evaluation involve the deliberate and rational generation of data useful to the technical and managerial personnel who control development. T&E may be defined broadly as all physical testing, experimentation and analyses performed during the course of research, development, introduction and employment of a weapon system or subsystem.

7.1.2 T&E Functions. Test and evaluation are integral to the development of systems and equipments. Testing provides information for a number of purposes and several classes of information users. Principal purposes include:

7.1.2.1 Information for development. Testing of systems under development is used to identify and resolve technical uncertainties and problems. While information on such problems is generated primarily through testing by the developer, various Government tests generate information useful in the design-test-evaluate-redesign process that is basic to the development of reliable material.

7.1.2.2 Information for acquisition milestone decisions. Many of the major milestone decisions, such as to initiate development or to conduct full-scale development, essentially are investment decisions. The decision makers are responsible for putting available resources to their most productive use. The issue in these milestone decisions is whether initiating, continuing, or committing additional resources to the acquisition will result in the most productive use of the required resources—money, material and personnel (see 2.5.4).

T&E provide information for these decisions, including data on operational effectiveness, operational suitability (including reliability, operational supportability, organization, doctrine and tactics for system deployment), needs for modifications or further development, and for

estimating the probable cost of completing development, acquisition and ownership.

7.1.2.3 Information for effective operational utilization. The operating forces are another set of users of test information. An output of the operational evaluation effort is the development of tactics and doctrine for the most effective use of the system.

7.1.3 Policy on T&E. Development policy requires periodic performance demonstrations. Programs are structured and resources allocated to ensure that the demonstration of achievement of program objectives is the pacing function.

A basic policy for operational test and evaluation is the concept of the "independent evaluation." An organization with a vested interest in "selling" the developing system is not to have unilateral control in establishing test requirements, the conduct of tests or evaluation of results. The operating forces and the "buyer" of the system (for example, SECDEF for major programs) play a key role in determining test requirements and have access to an independent evaluation of test results.

Assessment of operational effectiveness and suitability through Initial Operational Test and Evaluation (IOT&E) is required before the major production decision. IOT&E must be the product of an independent test organization: Operational Test and Evaluation Force (OPTEVFOR) or the Marine Corps Operational Test and Evaluation Activity (MCOTEA).

The principle of independent evaluation always has been fundamental to Navy development procedures. Evaluation for operational effectiveness and suitability, including a recommendation for fleet introduction, is performed by OPTEVFOR. Acceptance trials of vessels are conducted by the Board of Inspection and Survey. Both organizations report directly to the Chief of Naval Operations for these purposes.

No new system or significant alteration to an existing system may be approved for production until it has been adequately tested and proved operationally effective and suitable (including logistical supportability).

Ref.: DOD Directives 5000.1, 5000.3; DOD Instruction 5000.2; SECNAV Instruction 5000.2; OPNAV Instructions 3960.10, 5000.42, 5000.49

7.1.4 T&E in the acquisition cycle. T&E is an essential part of the acquisition process. T&E begins in the earliest phase of RDT&E with experimental testing of scientific hypotheses and continues beyond completion of development where primary emphasis is on perfecting doctrine for the most effective employment of advanced weapons.

Ref.: DOD Directive 5000.1, SECNAV Instruction 5000.2

7.1.5 Congressional Interest in OT&E. The general policy of adequate operational test and evaluation (OT&E) has strong Congressional support. Submission of data on all OT&E for every system for which procurement funds are requested is required by statute. This basic policy has been incorporated in each subsequent Act. (See Appendix H, Section H1.) Congress emphasized this continuing concern by including in the 1984 act a requirement for a Director of Operational Test and Evaluation (DOT&E) reporting directly to SECDEF (see 7.2.1.2).

7.1.6 Waiver of T&E Requirements. Waivers of the T&E requirement are rare, and the process purposely is difficult. Only the Secretary of Defense can grant such waivers to an approved SCP/DCP/TEMP for a major program.

Ref.: DOD Directive 5000.3

7.1.7 Approval for Production Milestones. There may be several Milestone III, "Production," decisions, particularly for very costly programs.

Ref.: SECNAV Instruction 5000.2

7.1.7.1 Approval for Full Rate Production. Approval for Full Rate Production (AFRP) signifies that:

- The system has demonstrated, through TECHEVAL, achievement of its technical thresholds.
- The system has demonstrated, through OPEVAL, achievement of operation thresholds and its operational effectiveness and operational suitability.
- The system has demonstrated, through ILS audit, that support planning is satisfactory.
- No additional development work or corrective action is required.

7.1.7.2 Approval for Low Rate Initial Production. Approval for Low Rate Initial Production (ALRIP) indicates that all but a specific set of requirements for AFRP have been met and that a plan and funding exists for meeting those requirements prior to the next year's production decision point.

7.1.7.3 T&E for Non-Development Items (NDI). The use of an NDI solution will be considered, as a matter of policy, as a part of or instead of a customary R&D effort. In describing any NDI to be considered, the advocate will describe the required degree of T&E.

Ref.: SECNAV Instruction 4210.7; OPNAV Instruction 3960.10

7.2 ORGANIZATION FOR TEST AND EVALUATION

Several organizations and individuals are responsible for the various T&E phases relating to the Navy's systems development process. These include functions by the OSD as well as the Department of the Navy. Appendix H provides supplemental data to the summary information discussed herein.

7.2.1 T&E Responsibilities in OSD. T&E responsibilities in OSD are divided between the Deputy Director Test and Evaluation and the Director, Operational Test and Evaluation.

Ref.: DOD Directive 5000.3

7.2.1.1 Deputy Director, Test and Evaluation. The Deputy Director, Test and Evaluation, (DDT&E), serves as the principal staff assistant and advisor to USD(A) on T&E within DOD. His responsibilities include:

- Overseeing all DT&E conducted with DOD, including designating RDT&E programs as major for such oversight. He provides advice and recommendations to SECDEF and guidance and consultation to Component Heads.
- Serving as OSD focal point for review, coordination and approval of TEMPs. (DDT&E) and the Director of Operational Test and Evaluation (see 7.2.1.2) are approval authorities for all DOD major program TEMPs.
- Monitoring and reviewing RDT&E to ensure adherence to policy, guidance and standards.
- Providing the DAE and DAB principals at each major systems review a technical assessment of T&E conducted by Navy and other DOD organizations.
- Designating observers as required to be present at DT&E activities.

- Overseeing major DOD Ranges and Test Facility Bases (MRTFB) (see 7.3.5); developing test resources.
- Serving as the OSD focal point for review, coordination, and approval of Live Fire Test and Evaluation (LFT&E) policy.

7.2.1.2 Director of Operational Test and Evaluation. The Director of Operational Test and Evaluation (DOT&E) is the principal staff assistant and advisor to the Secretary of Defense on OT&E and is the DOD's principal OT&E official (see 1.2.5 and H2.2). His principal responsibilities include:

- Monitoring and reviewing all OT&E within DOD.
- Designating observers to be present during preparation for and conduct of the testing portion of OT&E.
- Controlling joint OT&E and coordinating OT&E conducted by more than one Military Department or Defense Agency.
- Analyzing the results of major system acquisition OT&E. For major systems and DOT&E oversight programs, reporting to SECDEF and to Congressional Armed Services and Appropriations Committees that OT&E:
  - — is adequate and
  - — confirms effectiveness and suitability for combat of systems tested.
- Making recommendations to SECDEF on all budgetary and financial matters pertaining to OT&E, including facilities and equipment.
- Approving OT&E plans for major defense acquisition programs and DOT&E oversight programs.

Ref.: DOD Directives 5000.3, 5141.2

7.2.2 SECNAV's T&E Involvement. The Secretary of the Navy, as head of the Department of the Navy, is responsible for the policies and control of the Navy, including weapon systems acquisition programs. SECNAV assigns general and specific Research and Development T&E responsibilities to the Assistant Secretary of the Navy (Research, Engineering and Systems) and to the Chief of Naval Operations.

Ref.: DOD Directive 5100.1 (SECNAV 5410.85); SECNAV Instruction 5430.7

7.2.3 T&E Responsibilities in OPNAV. The CNO has responsibility for ensuring the adequacy of the Navy's overall test and evaluation program. T&E policy and guidance are exercised through the Director, R&DR,T&E (OP-098) in accordance with overall policies of the Secretary of the Navy. (See 1.4.6.1.)

T&E staff support for the Director, R&DR,T&E is provided by the Test and Evaluation Division (OP-983).

OP-983 is responsible for implementing the responsibilities of the Director, R&DR,T&E for planning, conducting and reporting all test and evaluation associated with development of systems and equipment. OP-983 also acts as the Resource Sponsor for Navy MRTFB components to ensure adequate range support of RDT&E projects. The OPNAV Sponsor is responsible for establishment of acquisition program requirements and related system thresholds.

Ref.: OPNAV Instructions 3960.10, 5430.48

7.2.4 Board of Inspection and Survey. The Board of Inspection and Survey—"BIS" to the aviation community, "INSURV" in ship circles—is responsible for conducting acceptance trials of vessels and aircraft. The INSURV also conducts material inspections of vessels, surveys of vessels,

and such other inspections and trials of naval vessels and aircraft as may be directed by the CNO.

The Board of Inspection and Survey consists of a permanent president (PRESINSURV) and small permanent staff. This cadre is augmented by personnel and resources from other organizations for the conduct of particular trials. For example, in performing INSURV trials of aircraft, test pilots and other personnel are assigned temporarily to the Board of Inspection and Survey. The technical commands supply assistant inspectors for ship trials and inspections.

Ref.: Article 0321, U.S. Navy Regulations, 1973; OPNAV Instructions 5420.70, 3960.10

7.2.5 Operational Test and Evaluation Force. Operational Test and Evaluation Force (OPTEVFOR) is the Navy's independent test agency responsible for initial and follow-on OT&E. (See 7.4.2.) Projects are assigned to OPTEVFOR by CNO, and COMOPTEVFOR reports for command directly to CNO. Results of OPTEVFOR evaluations are reported to CNO, SECNAV and, when appropriate, to CMC by the Commander, OPTEVFOR.

Having a relatively modest number of personnel and resources on the east and west coast, COMOPTEVFOR relies heavily on the facilities, resources, and personnel of the operating forces, the developing agencies, and field activities for carrying out his mission. Close liaison is authorized and exercised with appropriate elements of the Systems Commands and other T&E organizations to facilitate test support.

OPTEVFOR is involved in varying degrees with all phases of R&D from basic research to evaluation of newly developed equipment and appraisal of systems already in the Fleet. Involvement in early phases of research and development includes inputs to the Test and Evaluation Master Plan (TEMP), observing development testing, and conducting those phases of operational testing necessary to provide CNO or the CMC with an early and independent operational assessment.

Ref.: OPNAV Instructions 5440.47, 3960.10

7.2.6 T&E Focal Points/Coordinators. Responsibility for coordination of T&E matters in the designated PMs, Systems Commands, and DON Centers rests with a T&E Focal Point, T&E Coordinator, or Assistant PM(T&E). Typical functions of the T&E Coordinator for a Systems Command include:

- Developing comprehensive information concerning availability of resources, timing and requirements of test programs, and T&E workloads at various commands.
- Assisting in the preparation and review of the T&E portion of major planning documents such as MNS, DOPs, ORs, TEMPs, APs, PMPs and PCPs.
- Monitoring test program progress, and recommending program readiness to proceed through successive phases of development.
- Coordinating meetings on certification of readiness for OPEVAL, adjudication of internal systems problems and internal reviews of TEMPs.

7.2.7 Program Managers. The Program Manager (PM) is responsible for developing and executing an adequate T&E program. His T&E responsibilities include:

- Defining, in collaboration with the CNO Program Coordinator and COMOPTEVFOR, a test program which will illuminate test issues and problems (see 7.5.1).
- Preparing and updating the TEMP (see 7.5.3).

- Arranging performance of required T&E.

7.2.8 T&E Coordinating Group. Complex, multifaceted programs may require extensive T&E coordination. To assist in this, a T&E Coordinating Group (TECG) may be established by OP-098. The TECG will include the Program Coordinator, the Development Coordinator, and others as appropriate (such as a PRESINSURV representative for ship and aircraft programs). TECG recommendations may be included in the TEMP.

Ref.: OPNAV Instruction 3960.10

7.2.9 T&E Responsibilities in the Marine Corps. The CMC has responsibility for ensuring the adequacy of testing and evaluation of all systems to be acquired by the Marine Corps. T&E policy and guidance are exercised through the Commanding General, Marine Corps Research, Development and Acquisition Command (CG,MCRDAC) for development testing, in accordance with overall policies of the Secretary of the Navy and the Secretary of Defense.

Ref.: DOD Directive 5000.1; SECNAV Instruction 5000.1

7.2.9.1 Marine Corps Operational Testing and Evaluation Activity (MCOTEA). As with other Services, Operational Testing, including IOT&E and FOT&E, must be conducted by a major field agency separate and distinct from both the using command and the command with development and/or procurement responsibilities. The Marine Corps Operational Test and Evaluation Activity (MCOTEA) performs this function for and reports the results of its independent evaluation to the CMC. OT&E is conducted in phases appropriate to key decision points in the system acquisition process.

Ref.: MCO 3960.2

7.2.9.2 Fleet Marine Forces. The Fleet Marine Force (FMF) is responsible for conducting OT&E under the direction of MCOTEA, supporting DT&,E in coordination with CG, MCRDAC, and providing personnel or units to participate in joint T&E as assigned.

Ref.: MCOs P5000.10, 5000.11

7.3 TEST AND EVALUATION RESOURCES

This section describes the policies, organizations and responsibilities associated with the resources essential to T&E programs, including the range and test facility base, field RDA support, new test capabilities, and facilities and targets.

7.3.1 T&E Field Activity Capabilities. The various capabilities of the Navy's T&E field activities can be found in referenced publications and by conferring with such agencies as the OPNAV T&E Division (OP-983), the T&E/Fleet Support branch of the appropriate SYSCOM, and PMs.

Ref.: RDT&E Center Management Briefs; NAVSEA Test and Range Facilities Catalog; Army Material Development and Readiness Command DARCOM 70-1, Army Test Facilities Register; Air Force Systems Command AFCP-80-3, Air Force Test Facilities Register

7.3.2 Scheduling Use of Facilities. Advanced scheduling is the key factor in obtaining use of test ranges and other facilities. Early liaison with facilities supervision will assist in the definition of a practical test plan to be incorporated in the TEMP, and will allow the facility the leadtime needed to provide required support. Funding of such tests is discussed in 7.5.4.

Ref.: DOD Directive 3200.11 (OPNAV 3900.25); OPNAV Instruction 3900.25

7.3.3 Obtaining New Facilities. If the identification of T&E capabilities reveals that new facilities will be needed, extra long leadtimes may be necessary to obtain MILCON funding and to complete construction.

According to T&E funding policy (see 7.5.4), MILCON expenditures may be considered part of the institutional share, chargeable to the T&E facility. This should be negotiated with the NAVAIR Deputy Assistant Commander for Navy Ranges and Field Activities Management (AIR-42).

Ref.: DOD Directive 3200.11; OPNAV Instruction 3900.25

7.3.4 Land-Based Test Sites. The complexity of modern systems and their attendant software and integration requirements have emphasized the value of Land-Based Test Sites (LBTS) to the development, integration, test, configuration management, and life-cycle support of many Navy systems. An LBTS is a facility duplicating or simulating a system's planned operational capability.

Use of a LBTS, if in lieu of an actual host platform, must be justified based on cost-effectiveness and needed capability, and requires OP-098 approval. OT&E is to be conducted in an operational environment. Therefore, OT&E intended to support production decisions will be performed in an operational environment rather than a LBTS, except when otherwise directed by CNO.

Ref.: OPNAV Instruction 3960.10

7.3.5 Major Range and Test Facility Base. The mission of the Major Range and Test Facility Base (MRTFB) is to provide a comprehensive range and test support base to all DOD components and other authorized users responsible for R&D development and for operation of equipment and weapon systems.

The MRTFB is composed of 20 DOD major ranges and test facilities, which are managed by the Services and monitored for OSD by the Deputy Director, Test and Evaluation (see 7.2.1.1).

The Director, Test and Evaluation Division (OP-983) is responsible for management of Navy elements of the MRTFB at the OPNAV level (see 7.2.3).

Ref.: DOD Directive 3200.11; OPNAV Instruction 3900.25

7.3.5.1 Elements of the MRTFB. Each of the elements listed below is operated by one of the Services.

- Navy elements
  - — Atlantic Fleet Weapons Training Facility
  - — Atlantic Undersea T&E Center
  - — Naval Air Propulsion Center
  - — Naval Air Test Center
  - — Naval Weapons Center (T&E portion only)
  - — Pacific Missile Test Center
- Army elements
  - — Aberdeen Proving Ground (Material Test Directorate only).

- — Dugway Proving Ground
- — Electronics Proving Ground
- — Kwajalein Missile Range
- — White Sands Missile Range
- — Yuma Proving Ground

- Air Force elements
  - — Air Force Flight Test Center (includes Utah Test and Training Range)
  - — Armament Division
  - — Arnold Engineering Development Center
  - — Eastern Space and Missile Test Center
  - — Space and Missile Test Organization
  - — Tactical Fighter Weapons Center (Range Group only)
  - — Western Space and Missile Test Center
  - — 4940th Test Wing

7.3.5.2 Funding. Most MRTFB activities operate under the DOD uniform funding policy, i.e., the user pays direct costs of services provided and the T&E activity pays indirect costs. This ensures that T&E is carried out at the best qualified activity, regardless of managing Service, by providing some cost uniformity among activities (see 7.5.4).

Early T&E program liaison is necessary to establish resource and schedule requirements needed to develop realistic cost estimates, including cost of new resources which may be "user unique" and, therefore, chargeable to the program.

7.3.6 Targets. NAVAIR (PMA208) is responsible for developing, acquiring and managing aerial, surface and seaborne (excluding underwater) targets for support of T&E and Fleet training programs. The development, acquisition, and management of underwater targets are controlled by NAVSEA (SEA 6343).

7.3.7 R&D Support. R&D support encompasses the support provided by operational naval forces having a primary mission other than R&D to the DA, COMOPTEVFOR, PRESINSURV, or an R&D agency. There are three types of R&D support: dedicated support precludes employing the supporting unit in other missions; concurrent support permits employment of the supporting unit in activities other than R&D support, but will have an operational impact upon the unit's employment; and NIB (not-to-interfere basis) support permits employment of the supporting unit without interference from the R&D.

Ref.: OPNAV Instruction 3960.10

7.3.7.1 R&D support requirements. R&D support requirements include the following:

- Approved TEMPs (See 7.5.3)
- Requests for R&D support not related to specific acquisition programs
- COMOPTEVFOR test requirements.

From these three inputs, OP-098 annually compiles and publishes "CNO Long-Range R&D Support Requirements" for the budget-and-out-years. Fleet commanders use this report for guidance in planning, programming, and budgeting R&D support.

Using these same three inputs, updated by confirmation procedures, OP-098 quarterly compiles and publishes "CNO Quarterly RDT&E Support Requirements" for the forthcoming quarter. This summary is used as a tool in the quarterly Fleet scheduling conferences.

7.3.7.2 R&D Support Priorities. OP-098 assigns a priority (applying to Fleet support only) to each R&D support task identified in the "CNO Quarterly RDT&E Support Requirements."

- Priority ONE support tasks take precedence over normal Fleet operations
- Priority TWO support tasks are equal to normal Fleet operations
- Priority THREE support tasks take precedence after normal Fleet operations.

7.3.7.3 Scheduling R&D support. Fleet commanders-in-chief schedule support tasks indicated in the "CNO Quarterly RDT&E Support Requirement" in accordance with assigned priorities. COMOPTEVFOR coordinates R&D support scheduling for CNO and reports to CNO, quarterly, concerning the support provided.

7.3.7.4 OT&E Support for the Marine Corps. The Marine Corps requests OPTEVFOR OT&E support from CNO, who then gives appropriate direction to COMOPTEVFOR. When such support is provided, OT&E planning is coordinated with CMC, and COMOPTEVFOR reports his independent evaluation to CMC and CNO. Operational Test & Evaluation planning for Navy programs having USMC application includes MCOTEA coordination, and MCOTEA is provided program documentation, test plans, and reports.

7.3.8 RDTE Platform Resources. These resources include ships and aircraft that are dedicated to acquisition and nonacquisition programs. Ship assets are managed and supported by NAVSEA (SEA-05R12), and the aircraft assets by the NAVAIR RDT&E Aircraft Inventory Branch (AIR-4213).

7.4 TEST AND EVALUATION CATEGORIES

The Navy classifies tests into two official categories: Developmental Test and Evaluation (DT&E) and Operational Test and Evaluation (OT&E).

The OSD also has test categories which are used by the Navy, depending on the equipment or hardware. The following paragraphs describe the general types of tests and provides examples of tests that are peculiar to specific types of equipment or platforms.

Ref.: DOD Directive 5000.3; OPNAV Instruction 3960.10

7.4.1 Developmental Test and Evaluation (DT&E). DT&E is conducted to:

- Demonstrate that the engineering design and development processes are complete
- Demonstrate that design risks have been minimized
- Demonstrate that the system will meet specifications
- Estimate the system's military utility when introduced.

DT&E is required for all acquisition programs. It is planned, conducted, and monitored by the Developing Agency (DA) or its designated organization. Objectives of each phase are developed by the DA and published in the TEMP.

Development Test and Evaluation is conducted in three major phases. If necessary, each phase may be divided into subphases, e.g., DT-IIIA, IIIB, etc.

7.4.1.1 DT-I. DT-I is conducted during the demonstration and validation (D&V) phase to support the Milestone II decision which leads to entry into Full-Scale Development (FSD) (See 2.5.4.3). Its principal purpose is to demonstrate that all technical risks have been identified and reduced to acceptable levels; that the best technical approaches have been selected; that, engineering (rather than experimental) effort now is required and the required technology is available.

7.4.1.2 DT-II. DT-II is conducted during the Full-Scale Development Phase to support the Milestone III decision which places the system into production. (This decision is the first decision to produce systems for permanent installation in Fleet organizations in Marine Corps units or for inventory (see 2.5.4.4).) It demonstrates that the design meets specifications regarding performance, reliability, maintainability, logistics supportability, interoperability, survivability, vulnerability, and safety; the human factors, and the total spectrum of electromagnetic environmental effects.

7.4.1.2.1 Technical Evaluation. The final subphase of DT-II is Technical Evaluation (TECHEVAL). A TECHEVAL is conducted, with production-type hardware and software, to determine whether the system(s) functions in a technically acceptable manner, meets design and technical performance specification, and is technically and logistically ready for Operational Evaluation (OPEVAL). The Developing Agency is responsible for planning the test program and obtaining results of tests.

Following TECHEVAL, the DA certifies to the CNO the system's readiness for OPEVAL. However, OPEVAL does not commence until the CNO accepts the DA's certification of readiness in accordance with OPNAV Instruction 3960.10.

7.4.1.3 DT-III. DT-III is conducted after the production decision for the purpose of verifying that product improvements or correlation of design deficiencies identified during TECHEVAL, OPEVAL, FOT&E or Fleet employment, are effective. For aircraft programs, the final phase of DT-III is conducted by INSURV using production units. Aircraft DT-III is accomplished as early as possible, preferably prior to Initial Operational Capability.

7.4.1.4 Production Acceptance T&E. Production Acceptance Test & Evaluation (PAT&E) is testing conducted on production items to demonstrate that they meet contract specifications and requirements. Most PAT&E is the responsibility of the DA. However, acceptance trials of new ship construction or major ship conversions are the responsibility of PRESINSURV. The objectives of PAT&E are published in the TEMP.

7.4.2 Operational Test and Evaluation. Operational Test and Evaluation (OT&E) assesses a system's operational effectiveness and suitability, identifies the need for modifications, and provides information on tactics. OT&E has three distinguishing characteristics: It is conducted in a realistic operational environment; using typical fleet-type personnel for operation and maintenance; against a simulated enemy, employing countermeasures.

OT&E is subdivided into two major categories: initial OT&E (IOT&E), which is all OT&E prior to the full production and fleet introduction decision; and follow-on OT&E (FOT&E), which is all OT&E following the production and fleet introduction decision. OT&E is also divided into four major phases (two IOT&E and two FOT&E) and may further be divided into subphases (e.g., OT-IIA, OT-IIB) if necessary.

The Navy is required to have one organization, separate and distinct from the developing, procuring, and using commands, which is responsible for *all* OT&E. The organization is the Operation Test and Evaluation Force (OPTEVFOR). OT&E is planned and conducted by COMOPTEVFOR who reports results direct to CNO.

Ref.: OPNAV Instruction 3960.10; DOD Directives 5000.1, 5000.3

7.4.2.1 OT-I. OT-I is that IOT&E conducted during the validation phase to support the full-scale development decision. The objectives of OT-I are to provide an early assessment of the system's potential operational effectiveness (sufficient to justify continuation of development) and to provide operational information on system characteristics.

OT-I is not required for most programs. It is scheduled only for systems using new operational concepts or those involving significant operational risks. For a major system, if the Milestone II decision includes committing procurement funds for long-lead items or entering Low Rate Initial Production (LRIP), the DOT&E must provide the DAE and the DAB principals an assessment of system operational effectiveness and suitability, based on operational testing.

7.4.2.1.1 The Low Rate Initial Production Report. The Low Rate Initial Production (LRIP)

Report, documents the Director OT&E's assessment of the adequacy of OT&E and the combat effectiveness and suitability of a weapon system. It is provided to SECDEF and the Congress. The LRIP Report for any major system must be received by appropriate congressional committees prior to a SECDEF decision to proceed beyond low-rate initial production.

DOD Directives 5000.1, 5000.3; SECNAV Instruction 5000.2

7.4.2.2 OT-II. OT-II is that IOT&E phase conducted during the full-scale development phase to support the production and Fleet introduction decision. OPEVAL is the final subphase of OT-II. Specific OT-II objectives include demonstrating the achievement of program objectives for operational effectiveness and suitability, and initiating or continuing tactics development. OPEVAL is conducted using production-representative hardware and begins no sooner than one month after TECHEVAL testing.

7.4.2.3 OT-III. OT-III is that FOT&E phase conducted after the production and fleet introduction decision. Normally, OT-III is conducted with the same preproduction prototype or pilot production systems used in OPEVAL. Specific OT-III objectives include testing of fixes to production systems, completing any deferred or incomplete IOT&E, continuing tactics development, assessing operational availability evaluating the system in different platform applications, and for block revisions to a system's software to verify sustained, improved software performance.

For ship programs, OT-III is conducted with the lead ship during the period from delivery to the start of postshakedown availability (PSA).

7.4.2.4 OT-IV is that FOT&E conducted on production systems. An initial objective of OT-IV is demonstration of the achievement of program objectives for production system operational effectiveness and suitability (especially reliability, maintainability, and logistic supportability). Other OT-IV objectives include OT&E of the system in new environments, in new applications, or against new threats.

For ship programs, OT-IV is conducted with the lead ship or designated follow ship after expiration of SCN funding authority to verify that critical deficiencies identified during previous T&E have been corrected and to complete FOT&E not accomplished in OT-III.

7.4.3 Board of Inspection and Survey Acceptance Trials. The Board of Inspection and survey is responsible to the CNO for conducting acceptance trials of new ships prior to Navy acceptance from the contractor. They also monitor all DT&E testing of new model aircraft and conduct the final phase of DT-III testing.

Trials of ships are conducted to determine if they are suitable for their intended missions and if they have been constructed in accordance with contract specifications. After completion of acceptance trials, the Board documents material, performance, and design deficiencies and reports to the CNO its recommendation on the Navy's acceptance of the ship.

Ref.: OPNAV Instructions 3960.10, 5420.70; INSURV Instruction 13100.1

7.4.4 Joint Service Programs. Joint Service programs involve two or more Services or agencies.

Ref.: DOD Directive 5000.3; OPNAV Instruction 3960.10

7.4.4.1 Joint Test and Evaluation. Joint Test & Evaluation (JT&E) programs are sponsored by OSD to obtain information required by Congress,

OSD, Unified or Specified Commands, or DOD Components. They may be JDT&E, sponsored by DDT&E, or JOT&E, sponsored by DOT&E. A lead service is selected to plan and conduct the test, with participation by other services as appropriate.

7.4.4.2 Two-sided testing. Two-sided operational testing involves testing one system against another in a realistic environment. Such tests evaluate system performance and operational suitability under realistic two-sided operational conditions, including free-play between offensive and defensive forces whenever possible.

7.4.4.3 Multiservice T&E. This is T&E conducted jointly by two or more Services for systems to be acquired by more than one Service, or for a Service's systems that have interfaces with equipment of another Service.

Multi-Service T&E is planned, conducted and reported under the procedures of the lead Service (or agency).

7.4.4.4 Funding of joint service programs. Most costs of joint tests are paid from a special RDT&E appropriation, "Director of Test and Evaluation, Defense," which is administered by the Director, Defense Test and Evaluation, OUSD(A). Services pay the Operational & Maintenance (O&M) participation costs for units/personnel involved.

Ref.: DOD Directive 5000.3; OPNAV Instruction 3960.10

7.4.5 Combined and/or Concurrent DT/OT. DT&E and OT&E may be combined when cost and time benefits are significant and clearly identified, provided that test objectives are not compromised. TECHEVAL and OPEVAL may not be combined.

Whenever possible, DT/OT periods are conducted "concurrently" rather than "combined" since contractor participation in operational testing is limited by PL 99-661. Concurrent DT/OT permits contractor participation in DT events and still allows operational testing to be conducted autonomously.

Ref.: DOD Directive 5000.3; OPNAV Instruction 3960.10

7.5 PLANNING FOR TEST AND EVALUATION

Requirements for test and evaluation are central to R&D planning. TEMPs (see 7.5.3) are organized around an orderly sequence of milestone decisions and the associated tests and demonstrations that provide information for those decisions (see 7.1.2). Effective planning provides groundwork for the necessary T&E to ensure that the equipment is ready for test and that test resources required to conduct the tests are available when needed.

Recognizing the need for adequate statistical test planning, design and evaluation is essential to obtaining meaningful results.

The most important single source of T&E planning information is early and close collaboration with personnel of the prospective testing organization(s).

Ref.: DOD Instruction 5000.2, DOD Directive 5000.3; OPNAV Instruction 3960.10

7.5.1 Definition of Test Issues and Problems. T&E Planning has the goal of identifying and defining the issues and problems to be attacked through various tests and evaluations. These issues and problems constitute "performance specifications" for the information to be produced through the T&E process. Thus, a primary consideration in defining the information to be

sought is a clear idea of the decisions to be made and other uses for which information may be of value.

For major systems, the critical issues identified throughout the development period are addressed in the Decision Coordinating Paper (DCP). The total test plan is to be developed so that answers to critical issues and questions required by decision milestones can be obtained in an efficient and timely manner.

The CNO Development and Program Coordinators, in collaboration with the Program Manager and COMOPTEVFOR, prepare the initial statement of issues and problems. These data are used in the System Concept Paper (SCP) (See 2.5.5.1).

7.5.2 Coordination with OPTEVFOR. The Developing Agency (DA) maintains early and continuing liaison with COMOPTEVFOR to ensure that the DT&E program is understood and that OT&E requirements are identified and integrated into the program, including proper budgeting. The DA is required to provide COMOPTEVFOR all significant DT&E test data and analyses to assist in planning or interpreting OT&E. COMOPTEVFOR is responsible for monitoring all pertinent phases of DT&E.

7.5.3 Test and Evaluation Master Plan (TEMP). For each ACAT I, II, III and IV program, the TEMP is the controlling test & evaluation management document. For ACAT III and IV programs, the TEMP is the single document by which the program is controlled.

The TEMP is reviewed annually and about three months prior to DAB or equivalent, and is updated to reflect significant results achieved and changes to plans and milestones (see 2.5.6).

The TEMP is prepared by the Developing Agency (DA) in cooperation with COMOPTEVFOR (and PRESINSURV when appropriate). The DA is solely responsible for the DT&E and PAT&E sections and the COMOPTEVFOR for the OT&E section. However, early and close coordination between the DA and OPTEVFOR is essential in the preparation of the DT&E section to ensure that data obtained in such areas as reliability and maintainability are statistically useful in the OT&E phase.

The current TEMP for programs below ACAT II is submitted by the DA through the Program Sponsor (ACNO/DCNO/DSO) to OP-098 for approval. Where higher-level approval is required—USD(A) for ACAT I, ASN(R,E&S), for ACAT II—OP-098 coordinates such approvals. A TEMP, approved by OSD or ASN(RES), is required with the SCP/DCP or NDCP prior to each milestone decision for ACAT I or II programs. The DOT&E reviews all DOT&E oversight program TEMPs, and, in conjunction with DDT&E, is the OSD approval authority for these TEMPs.

Approval of the TEMP (or TEMP revision) constitutes CNO direction to conduct the T&E program, including the commitment of RDT&E support. Considerations for preparation of a Navy Training Plan (NTP) are addressed in the TEMP. The NTP should be approved prior to the earlier of Milestone II or certification of OPEVAL. (See 2.5.4.1 and 2.5.5.4.)

Ref.: SECNAV Instruction 5000.2; OPNAV Instructions 1500.8, 3960.10

7.5.4 Funding T&E. DOD has directed that certain DOD T&E activities adopt a uniform funding policy. This policy requires customers to pay direct range costs for their test programs, while the test facility pays indirect and overhead costs with funds provided by its parent Service.

The objective of DOD's policy is to give greater visibility for the T&E program, to increase cost comparability among the various T&E activities, and to reduce cost biases in the placement of T&E work.

In keeping with DOD policy, funds for developing certain new testing facilities

(MILCON) may be considered part of the institutional share, chargeable to the T&E facility. This is to be negotiated with the facility staff. On the other hand, new test equipments needed for a specific project may be considered part of the industrial share and charged to the project funds.

A major portion of OPTEVFOR testing costs is paid by the units involved through Fleet Operation and Maintenance (O&M) funds. However, the project must pay a significant part.

At the time of test execution, funds are transferred to the test activity based on current estimates of probable costs. If costs exceed estimates additional funds must be provided; if they are less, the surplus is returned to the project.

The DA plans, programs, budgets and funds the costs of most resources identified in the approved TEMP. OPNAV Instruction 3960.10 contains specific funding guidelines.

7.5.5 T&E Task Statements. Task statements are used to advise technical and managerial test personnel what is to be tested, specific questions to be answered and other data the test should produce. Testing activities and the SYSCOMs usually have suggested or mandatory task statement formats to meet their testing procedures and requirements. Specific information on these requirements can be obtained through preliminary liaison with test activity personnel.

7.5.6 Test Resource Planning. The TEMP has a summary of the resources essential to accomplish the test program such as test articles, test activities to be utilized, special facilities and instrumentation, test platforms, and required fleet support services. Early identification and planning for these requirements is particularly important should new facilities be needed which require MILCON, or assets such as new instrumentation or targets which need to be developed (see 7.3).

7.5.7 T&E Identification Number. OP-098 assigns a T&E identification number (TEIN) to each project assigned to a Developing Agency (DA) or COMOPTEVFOR for T&E. TEINs are sequential numbers assigned for the life of the program. TEINs are the TEMP numbers for ACAT I, II, III and IV programs.

Ref.: OPNAV Instruction 3969.10

7.6 FLOW OF TEST & EVALUATION INFORMATION TO USERS

This section covers the forms of information developed through T&E and its flow to users.

7.6.1 T&E Information for Developers. For T&E integral to the development process, development personnel normally are direct participants in tests and thus receive "instant feedback." They have little need for permanently documented information since changes in the evolving design occur and are rapidly evaluated in other experimental tests. However, for some development test formal technical reports are required.

7.6.2 Information for Program Managers. Much of the T&E information used in decisions of the Program Manager is based on personal contacts, telephone discussions with test personnel, and day-to-day dispatches on test results. The most important source of information is direct observation of and participation in important tests by the Program Manager and his staff. Formal technical reports usually are required (See 7.6.6).

7.6.3 Information for Milestone Decisions. Information required for major investment decisions (see 2.5.4) will be formal, documented, and based on extensive evaluation. In the evaluation process, information from tests will be integrated with information on other crucial information such as the continuing requirement for the system itself.

7.6.4 Information for Operating Forces. An important product of tests, particularly Operational

Evaluation (see 7.4.2), will be doctrine and tactics for effective operation of the system. COMOPTEVFOR publishes this information in a Tactics Guide. Additional information appears in such publications as NATOPS (Naval Air Training and Operating Procedures Standardization) manuals for the operation of aircraft and other tactical manuals. The results of T&E also are provided through improvements in maintenance and support procedures and other technical information.

7.6.5 Information for the Board of Inspection and Survey. Test activities performing Service Acceptance tests for INSURV are required to submit test results in formal technical reports to INSURV. These reports form the basis for INSURV's reports and recommendation to CNO and SECNAV.

7.6.6 Formal T&E Reports and their Availability. Formal reports of tests, other than development tests generally are prepared and filed in the Defense Technical Information Center (DTIC). These data then are available to all Need to Know users through normal DTIC distribution procedures (see D3, on DTIC).

7.7 TEST & EVALUATION OF INTEGRATED LOGISTIC SUPPORT

Navy's basic method to ensure that a system can be supported in the field is the Integrated Logistic Support (ILS) Planning System. The support system addresses operational and maintenance support concepts and requirements, and provides for the acquisition of the resources, e.g., needed personnel, data, spares, test equipment, and facilities (see 2.6.1).

A system's support effectiveness must be demonstrated in as realistic an operating environment as possible. Where practical, pilot or early production items are used. Where this is not possible, preproduction prototypes that are reasonably representative of future production designs are employed.

Ref.: SECNAV Instructions 4490.2, 5000.39; OPNAV Instruction 5000.49

7.7.1 Requirements for ILS T&E. ILS planning and products are subject to T&E just as is hardware. Operational availability (Ao) thresholds are established for all systems and equipments and documented in the TEMP. Objectives and criteria of the support system to support achievement of Ao thresholds also are established and documented in TEMPs. The ILS Manager (ILSM) assists in establishing these objectives and criteria. The ILSM also ensures adequate planning for logistic support of the test program.

7.7.1.1 Operational Availability (Ao). Ao is the basic readiness requirement for a system or equipment. It is expressed as the single Ao threshold the system or equipment must meet during both OPEVAL (at the end of development) and subsequently in the fleet. Ao is the percentage of time the system should be available for required use in its intended operational environment. Ao is established by the OPNAV warfare program sponsor in a system's earliest acquisition documentation.

Anticipating requirements to meet the projected threat, the OPNAV Program Sponsor analyzes and weighs performance characteristics, affordability, and supportability in calculating Ao. Ao is the quantitative link between readiness objectives and supportability. The SYSCOMs design and acquire systems and equipments to meet the established Ao threshold, and COMOPTEVFOR is responsible for assessing its achievement through OT&E.

Ref.: OPNAV Instruction 3000.12

7.7.2 Timing of ILS T&E. Logistic Support Test and Evaluation should be time-phased and in harmony with the hardware system test and evaluation program. Initially, analytical study of hardware design and configuration should be employed to maintain surveillance over progress in achieving stated requirements. As design and fabrication progress, increasing levels of tests and demonstration on actual hardware is employed. These should culminate in a formal preplanned operational test and evaluation in which the production hardware and the operational and logistic support resources are used in validating the efficacy of the integrated logistic support planning process.

7.7.3 Outputs of ILS T&E. The test and evaluation of ILS:

- Determines the validity of established preventive maintenance concepts
- Validates the accuracy and adequacy of operating and maintenance instructions and other job performance aids
- Validates the need and demonstrates the performance support and test equipment for conducting operational and maintenance tasks
- Determines, with statistical confidence if possible, system reliability and maintainability against specified operational suitability goals
- Verifies the need and adequacy of facilities (shipboard and shore-based) provided for the systems' operation and maintenance
- Validates the quantitative and qualitative operator and maintenance personnel levels and planned training
- Assesses the credibility of the spares and repair parts allowances established for operational units
- Evaluates the effectiveness of special handling, transportation and storage devices proposed for the system
- Verifies, with statistical confidence if possible, achievement of quantitative values specified, such as turnaround times, servicing rates, maintenance manhours per operating hour, rearming rate, and restoration times
- Assesses qualitative values such as safety, human factors, environmental protection devices, accessibility, and interchangeability.

7.7.4 Use of ILS T&E Results. Results of the Test and Evaluation program are used to modify, as appropriate:

- Operational and maintenance data
- Support and test equipment requirements and allowances
- Spares and repair part allowances
- Facility (shipboard and shore-based) adequacy, requirements, and arrangements
- Unit manning plans
- ILS planning documents
- Readiness measurement.

7.8 TEST & EVALUATION FOR SHIP ACQUISITION

Ship acquisition, while subject to the same basic DOD and Navy T&E policies applied to other systems and equipment procurement is an area in which special T&E applies. The accomplishment of ship T&E varies considerably from the normal test cycle due to the lengthy period for design, engineering, and construction of a major ship, and because ship T&E includes both that conducted on the ship platform itself, as well as that conducted on the equipments and systems to be installed on the ship.

Ref.: DOD Instruction 5000.3; OPNAV Instructions 3960.10, 4700.8; NAVSEA Instruction 3960.4; NAVSEA 0900-LP-095-2010, Ship Construction Tests and Trials Manual

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7.8.1 Policies and Principles. Because the development and construction period for a major ship normally precludes completion of DT&E and IOT&E on the lead ship prior to the production decision for follow-on ships, successive phases of DT&E and IOT&E are accomplished as early as practicable to reduce risks and minimize the need for modification to follow-on units.

The CNO will determine when a new ship class requires total ship OPEVAL, i.e., a "prototype" ship program. The CNO also will determine (1) when combat or propulsion system complexity warrants construction of land-based test sites, and (2) when technological advances in hull or propulsion design require prototyping.

DT&E and IOT&E prior to Milestone II generally consist only of T&E of the individual unproven shipboard systems and equipments. Such T&E, including validation of unproven shipboard test documentation, may be conducted on other ships or at land-based test sites.

For conventional ship acquisition programs (SCN-funded), DT&E and IOT&E between Milestones II and III consist of additional T&E of individual weapon systems, as well as T&E conducted at possible land-based test site(s). For prototype programs (RDT&E-funded), DT&E and IOT&E also includes T&E conducted on the lead ship itself.

For all classes of ships that require OT&E, continuing phases are accomplished on the lead ship at sea as early as possible in the acquisition process.

Ship Production Acceptance T&E must demonstrate that all systems are properly installed and operable in accordance with contract requirements and technical specifications. Because of the separation of milestones for delivery and operational readiness, and the segmented T&E periods that result, ship PAT&E is divided into two phases:

- The ship "construction" tests and trials phase includes all testing conducted on the ship during construction, including INSURV's Acceptance Trials. It also may include some earlier equipment PAT&E (such as factory acceptance tests) if imposed as a prerequisite to shipboard installation. For this phase, NAVSEA requires the development and conduct of an Integrated Test Package (ITP). The *Ship Construction Tests and Trials Manual* establishes procedures and organizational responsibilities for ship construction testing.
- The ship "post-delivery" tests and trials phase includes conventional tests and trials conducted on the ship from the time of ship delivery to and including INSURV's final contract trials and the post-shakedown availability. Post-delivery tests may include tactical trials, standardization trials, structural test firings, system qualification trials and operational readiness tests.

FOT&E, if conducted, usually occurs after the postdelivery test and trial period.

7.8.2 Ship Acquisition T&E Planning. The extensive coordination needed to plan and execute T&E for the many systems and equipments involved in a ship acquisition program may be effected through the program's T&E Coordinating Group (TECG).

The Ship Acquisition Program Manager (SHAPM) is the key NAVSEA representative for his respective TECG. He is responsible for developing, from OPNAV design requirements and his own risk analyses, definitive traceable test requirements necessary to demonstrate a progressive reduction of risk from initial factory T&E to land-based testing, ship construction tests and trials, and post-delivery tests and trials. To ensure effective planning and conformance to T&E policies, the SHAPM establishes early and continual liaison with OPTEVFOR and INSURV.

7.8.3 Organization for Ship T&E. Major participants in the planning and execution of ship T&E include:

- The Program Coordinator, who establishes the TECG for the ship formulation effort
- The T&E Coordinating Group (TECG), which establishes broad T&E requirements for a ship acquisition program and effects T&E coordination.
- The PM and/or SHAPM, who, in collaboration with OPTEVFOR, develops the TEMP and is the key NAVSEA representative for the TECG
- The Ship Design Manager, who is responsible to the SHAPM for production of the complete ship design, including test specifications
- COMOPTEVFOR, who participates in the T&E planning and conducts all OT&E.

7.8.4 Acceptance of Ships. Navy acceptance of a ship is based on the CNO's decision, contingent upon the satisfactory completion of INSURV Acceptance Trials as determined by PRESINSURV.

7.8.5 Certification of Ship Aviation Facilities. All aviation facilities in new and overhauled naval ships which operate aircraft must be inspected and certified as meeting approved standards of adequacy and safety established by the Chief of Naval Operations.

Ref.: OPNAV Instruction 3120.28

SELECTED REFERENCES ON TEST AND EVALUATION

DOD Directive 5000.3, "Test and Evaluation."

OPNAV Instruction 3960.10, "Test and Evaluation."

OPNAV Instruction 4700.8, "Trials, Acceptance, Commissioning, Fitting Out, Shakedown and Post Shakedown Availability of U.S. Naval Ships Undergoing Construction/Conversion/ Modification."

NOTE REGARDING DIRECTIVE NUMBERS

References to directives are by series only; e.g., 3900.14, not to the effective edition within the series; e.g., 3900.14A.

The "Master Reference List" provides the version and issue date of each directive.

For recent information on the effective directive within a series, consult "Department of the Navy Directives Issuance System: Consolidated Subject Index." (NAVPUBNOTE 5215).

Appendix A
READINGS IN ACQUISITION MANAGEMENT

The following readings are provided to help Guide users understand some of the forces and considerations underlying the continuing evolution of the RDA process as reflected in this publication.

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Appendix A
READINGS IN ACQUISITION MANAGEMENT

A1 EXCERPTS FROM CONGRESSIONAL TESTIMONY BY MR. THOMAS F. FAUGHT, JR., ASN(R,E&S), ON THE AMENDED FY 1989 BUDGET FOR THE NAVY RDT&E PROGRAM

INTRODUCTION

The purpose of this report is to inform the Congress of the status and future direction of the Navy's research and development (R&D) activities. It is the eleventh annual report provided for this purpose.

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The Environment

The environment which influences Navy's RDT&E development is changing more than at any time in the recent past. This dynamic situation arises from factors within and outside the control or influence of the federal government.

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Background

Historically, the applications of technology have impacted U.S. naval warfare and national defense significantly. The results of our RDT&E efforts - through the universities, industry and our own Navy laboratories and research and test centers - have materially strengthened every major platform, weapons system and command, control and communications structure.

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Resources

The Navy's RDT&E activities involve more than 44,000 people operating at many locations in the United States and abroad. The RDT&E annual budget in recent years has varied between $9.5 billion and $10.0 billion.

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We are proud of our people. They are the real drivers behind RDT&E developments and major resources for the Navy. Most of our people are scientists or engineers with many years of dedicated work and fine contributions. We have supported the research efforts of 29 Nobel laureates over the past four decades, including Dr. Jerome Karle, a long time employee of the Naval Research Laboratory. Dr. Karle shared the Nobel Prize for Chemistry in 1985. The work of our scientists and engineers is recognized worldwide through numerous advances in their respective science and technology fields.

In addition to the innovative talent in science and technology, we have strong technology management talent throughout our RDT&E system. This includes our civilian leaders and our military professionals who bring real fleet operational experience to the RDT&E community.

These people are Navy corporate as well as national assets that must be sustained. If the past is any measure of the future, then with adequate funding, these people are well able to provide innovative developments that are essential for the future fleet.

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Technology-Base

The key role of the Navy RDT&E program is to gain and maintain technology leadership that is essential to counter our adversaries.

Essential to this strategy is the Navy Technology Base - Tech Base - program comprised of Basic Research (6.1) and Exploratory Development (6.2). Through a spectrum of research and development in areas of engineering, life, physical, mathematical and environmental sciences, including oceanography, we focus on Navy and Marine Corps operational needs in high priority areas, such as anti-air warfare, antisubmarine warfare and command, control and communication support.

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Cooperative-Direction

The Navy plays an active role in international armaments cooperation. Meaningful collaboration with our allies in developing systems that meet common requirements is becoming increasingly important as weapon needs expand, costs increase and funding shrinks.

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RDT&E ACQUISITION PRACTICES AND PROCEDURES

We are taking a fresh look at acquisition practices and procedures. In so doing, we are emphasizing flexibility rather than rigid doctrinaire policies. Our approach is to analyze each program on its merits and determine the best business approach. We consider timing, technical, cost and schedule performance and the risk remaining in the program. However, in order to achieve the optimum results in such endeavors, there must be a synergistic approach by not only Navy, but by the Congress and industry as well.

There are eight initiatives needed to improve our acquisition practices and policies.*

First, we need constant and stable funding for each program to the maximum extent possible. Such stability provides a consistent labor force, a continuation of project teams (Navy and industry), continuity of ideas and talent, and a balanced, well thought out risk reduction process.

Second, we need to consider the best contract approach; that is, fixed price versus cost reimbursable. Each of these contract categories bring to the table advantages that must carefully be considered. To make the best possible choice, risk must carefully be considered, organizations must be optimal on the part of the buyer and seller, requirements and work content must be precise and both parties must be highly disciplined.

Third, we must reduce the staggering amount of regulations, policies, legislation and "players" in the acquisition process. If we all succeeed in this effort, the reduction of non-value added activities will reduce costs and time to field a system or piece of hardware.

Fourth, we must continue to emphasize a career path to flag rank for program managers. Presently, the materiel professional program in the Navy and Marine Corps is in the fourth year and is working well. We are rigorously selecting managers who have the best education, experience and proven performance. What is needed now is to permit these managers to exercise their judgment and if their performance is found lacking, replace them.

Fifth, we must pursue initiatives to encourage strengthening the industrial Tech Base. At the present time, the Navy Secretariat is coordinating a study with the Undersea Warfare Executive Committee of the American Defense Preparedness Association. Its purpose is to explore those acquisition policies that will allow us to run equitable competition at reduced cost and less impact on the Tech Base. In addition, we are carefully coordinating the activities of the Chief of Naval Research, the Systems Commands and the OPNAV sponsors regarding Tech Base program interface with the Navy laboratories, universities and industry.

Sixth, we must emphasize the incorporation of manufacturing technologies at the earliest possible time in the systems that we develop. We must ensure that we produce and manufacture products by the most innovative and cost-effective means that will yield consistent high quality.

Seventh, it is worthwhile to consider concurrency and prototyping in development of new systems depending on proven technologies and risk. The use of either of these development schemes, when applicable, would save money and time.

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*A closer scrutiny will show that these initiatives encompass many of the Carlucci Initiatives on Improving the Acquisition Process of April 1981.

Eighth and finally, we must continue the technique of naval industrial funding (NIF) at our laboratories and engineering centers, since these activities are required to be totally self sufficient in conducting their own base operations and maintenance in service engineering and research. The NIF program covers the overhead expenses, common to any business, and generates asset capitalization funds, a form of profit, which is used to modernize and improve its productivity.

Much progress has been achieved in the past year toward implementing Packard Commission recommendations concerning acquisition organization and procedures. In accordance with their proposals, the Secretary of the Navy appointed a Service Acquisition Executive for the Navy last fall. Also, as recommended, he is a top-level civilian Presidential appointee, of rank equivalent to a Service Under Secretary. In fact, in the Navy, the Service Acquisition Executive is the Under Secretary.

As the Navy Acquisition Executive (NAE), the Service Acquisition Executive makes decisions regarding continuation of major programs (ACAT I and some ACAT II) at each milestone in the acquisition cycle, provides acquisition policy guidance and direction and provides recommendations directly to the Defense Acquisition Executive. The role of the Assistant Secretary of the Navy for Research, Engineering and Systems, ASN(RE&S), has been refined further to support the NAE. The reorganization of the office of the ASN(RE&S) currently is in its final phase; the re-structuring being based on the Goldwater-Nichols Reorganization Act of 1986. The ASN(RE&S) provides advice and assistance to the NAE regarding all programs, from design and development through transition to Limited Rate Production.

The Navy Director for Research, Development, Requirements, Test and Evaluation (Dir, RDT&E) and the Commanding General, Marine Corps Research, Development and Acquisition (CG, MCRDA) decide on the continuation of the next level of programs, categorized as ACAT III. These two military oganizations report to the ASN(RE&S) in matters of research and development and R&D acquisition. Concurrently, they have specific responsibilities for and report to the Chief of Naval Operations and to the Commandant of the Marine Corps, respectively.

Again, referring to the Packard Commission recommendations, the Navy now has adopted a streamlined, limited-layer organization between the Program Manager and the Navy Acquisition Executive. There is a direct reporting relationship between the Program Executive Officers in the SYSCOMS to the NAE on acquisition matters.

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CONCLUSION

Much has been accomplished in the Navy's RDT&E program. However, because of the dynamics of RDT&E the changing environment, much yet remains to be done. This section summarizes and emphasizes the conclusions developed in this FY 1989 report. These are as follows:

- Technology is the Navy's future. The "Tech Base" is a fragile asset which requires understanding, nurturing, support and protection. This long term view applies to U.S. industry as much as to the Navy, perhaps more!

- Interservice and international cooperative efforts are major elements in the future Navy RDT&E program. We must rapidly and objectively explore those interoperability and cooperative opportunities that make sense for the Navy. The Marine Corps "get more for less" philosophy provides an excellent example of what is possible through cooperative interservice action.

- Strong relationships between the Congress and the Navy's R&D management is needed. Direct communications will enhance understanding of each other's activities, concerns and solutions. The Navy's R&D management attitude vis-a-vis the Congress will be "the door is always open."

- Greater *applications*-focus will make Navy Tech Base efforts more productive. Clearly, a portion of the Tech Base budget should be reserved for long term scientific research and innovative Exploratory Development efforts. However, military concepts and needs identified by naval force strategists should be the controlling "bottom line" for Tech Base planning and budgeting.

- More coordination is needed among the various Navy RDT&E organizations. Recognized by the Goldwater-Nichols legislation, this will improve planning, organization, control, use and accountability of resources. It will also reduce duplication and resultant cost.

- The Navy's senior, top level, policy and planning management should be "Battle Management" or "Warfare" organized; middle management on the other hand, should be "Platform" oriented. This action will strengthen mission focus which should assure that RDT&E efforts provide improved, more balanced results.

- More streamlining and flexibility are required in the Navy RDT&E process in order to reduce the time it takes for a weapons concept to reach IOC. The Carlucci Initiatives and Packard Commission each emphasized the excessive time and cost resulting from the nature and number of service, DoD and Congressional procedures, controls, regulations and legislation. Although some of these are valuable and necessary, evidence suggests that the absence of such are among the reasons why industry can "market" a product quicker and cheaper than the services. Each of us must understand that some degree of risk is attendent to any worthwhile enterprise. While we must be prudent to attempt to control for the worst case scenario, in most programs too much red tape is counter-productive. We must analyze the "whys" of the best program cases and devise and apply only appropriate measures.

- Future Navy RDT&E strategy (plans) must take into account (1) the "first to fight" global and regional responsibilities of our naval forces, (2) the nation's critical need to achieve significantly more effective weapons systems, and (3) our quantitative manpower limit vis-a-vis several of our potential adversaries. Thus, our RDT&E activities will focus on survivability, sustainability, maintainability, commonality, life-cycle extension and operational economy. This focus will apply to concepts including stealth/counter stealth; manual vs automated technology trade offs; counter-countermeasures; comprehensive, faster and secure communications; simpler, effective and flexible strike assets; and long range, zero CEP conventional weapons for INF initiatives.

- Insure that the future does not find us with too many programs and too few dollars. In a time of declining resources we must have the courage to say no to many "good" ideas and the wisdom to focus on the "best" ideas that will address the needs of our future naval forces.

FUTURE GOALS

Given the challenge of constrained resources, we have taken deliberate steps to develop a strategic plan for the future. This plan exists within a framework that considers the real world environment and the way it impacts the future fleet. To summarize our plan, let me provide you an insight into my four principal goals and the associated action areas for each.

GOALS	ACTION AREAS
1. Strengthen Basic Research and Exploratory Development	- Improve on the way we capitalize on opportunities presented by our Tech Base - Eliminate duplication - Strengthen participation by the operational Navy and Systems Commands - Strengthen retention and recruitment of technical personnel
2. Refine Our Contracting Relations and Approaches, and Reduce Time to IOC	- Modify instructions to increase flexibility - Streamline process, reduce oversight - Review Navy involvement in special tooling, and contractual aspects to strengthen the industrial base - Incorporate proven technology - Enforce technology and engineering "freezes" in development cycle - Computerize contractors' manuals and data for more rapid and accurate updating - Assure prime and subcontractors incorporating and maintain CPM scheduling technology; MANTECH approaches to automation - Provide budget stability - Improve concurrency balance - Increase interoperability
3. Strengthen Our R&D Organization and Structure	- Consider functional rather than "Appropriation" Plan - Complete implementation of SECNAV 5430 (Assignment of Responsibilities to ASNs for RE&S and S&L) - Strengthen continuity through Material Professional Program
4. Expand International Cooperative R&D Agreements	- Institutionalize procedure - Create organization; obtain funding - Review feasibility of 10% target, 25% projection - Assure technology transfer security

A2 EXCERPTS FROM "ACQUISITION ORGANIZATION AND PROCEDURES," CHAPTER 3 OF A QUEST FOR EXCELLENCE, FINAL REPORT OF THE PRESIDENT'S BLUE RIBBON COMMISSION ON DEFENSE MANAGEMENT (PACKARD COMMISSION)

A major task of this Commission has been to evaluate the defense acquisition system, to determine how it might be improved, and to recommend changes that can lead to the acquisition of military equipment with equal or greater performance but at lower cost and with less delay. For this purpose, the Commission formed an Acquisition Task Force.

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We compared the defense acquisition system with other systems, both government and commercial, that develop and produce equipment of comparable complexity, in order to find success stories that could provide a model on which reforms of the defense acquisition system could be based. Defense acquisition represents the largest and, in our judgment, the most important business enterprise in the world. It deserves to be managed with the highest standards. We therefore conducted a "search for excellence" by examining organizations that had been most successful in acquisition, in order to find a model of excellence for defense acquisition.

Chances for meaningful improvement will come not from more regulation but only with major institutional change. During the last decade or so a new theory of management has evolved. It has been developed by a limited number of U.S. companies, and it has flourished in Japan. These new management practices have resulted in much higher productivity and much higher quality in the products being produced. They involve the participation of all of the people in the organization in deciding among themselves how the job can best be done. They involve, above all, trust in people. They involve the belief that people in an organization want to do a good job, and that they will—if given the opportunity—all contribute their knowledge, skill, and enthusiasm to work together to achieve the aims and goals of their organization. Supervision can be minimized, and detailed review of work can be greatly reduced. A real sense of teamwork can be established. Every group in an organization can become a center of excellence, and in this way the entire organization achieves a level of excellence in every aspect of its work.

Centers of excellence have evolved here and there in the acquisition process, in the form of project teams that have developed and produced new weapons rapidly, efficiently, and with high quality performance. Unfortunately, this is not the way DoD typically operates. All too many people in DoD work in an environment of far too many laws, regulations, and detailed instructions about how to do their work. Far too many inspectors and auditors check their work, and there is a hierarchy of oversight in far too many layers, requiring much wasteful reporting and paperwork.

The quest for excellence in defense management will be successful only if a new management philosophy can replace the old. Instead of concentrating on the things that are being done wrong and trying to fix them with more laws, more regulations, and more inspectors, DoD should concentrate on those things that are done right and use them as models.

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All of our analysis leads us unequivocally to the conclusion that the defense acquisition system has basic problems that must be corrected. These problems are deeply entrenched and have developed over several decades from an increasingly bureaucratic and overregulated process. As a result, all too many of our weapon systems cost too much, take too long to develop, and, by the time they are fielded, incorporate obsolete technology.

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Although each of the cases we examined had its own peculiarities, we identified a number of problems that frequently recurred: for example, government insistence on rigid custom specifications for products, despite the commercial availability of adequate alternative items costing much less.

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It is clear that major savings are possible in the development of weapon systems if DoD broadly emulates the acquisition procedures used in outstanding commercial programs. In a few programs, DoD has demonstrated that this can be done. The challenge is to extend the correct management techniques to all major defense acquisitions, and more widely realize the attendant benefits in schedule and costs.

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It is fundamental that we establish unambiguous authority for overall acquisition policy, clear accountability for acquisition execution, and plain lines of command for those with program management responsibilities. It is also imperative that we streamline acquisition procedures. This can be facilitated by five related actions:

1. We strongly recommend creation by statute of the new position of Under Secretary of Defense (Acquisition).

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2. The Army, Navy, and Air Force should each establish a comparable senior position filled by a top-level civilian Presidential appointee.

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3. Each Service Acquisition Executive should appoint a number of Program Executive Officers.

Each Service Acquisition Executive should appoint a number of Program Executive Officers (PEO) who, like group general managers in industry, should be responsible for a reasonable and defined number of acquisition programs. Program managers for these programs should be responsible directly to their

respective PEO and, on program matters, report *only* to him. In other words, every major program should be set up as a center of excellence and managed with modern techniques. The Defense Acquisition Executive should insure that no additional layers are inserted into this program chain of command.

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We recommend a high priority on building and testing prototype systems to demonstrate that new technology can substantially improve military capability, and to provide a basis for realistic cost estimates prior to a full-scale development decision. Operational testing should begin early in advanced development, using prototype hardware. The early phase of R&D should employ extensive informal competition and use streamlined procurement processes.

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Rather than relying on excessively rigid military specifications, DoD should make greater use of components, systems, and services available "off-the-shelf." It should develop new or custom-made items only when it has been established that those readily available are clearly inadequate to meet military requirements.

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Federal law and DoD regulations should provide for substantially increased use of commercial-style competition, emphasizing quality and established performance as well as price.

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The caliber of uniformed military personnel engaged in program management has improved significantly of late. Military officers manage over 90 percent of DoD's roughly 240 program offices. Their ranks range from 0–5 (lieutenant colonel/commander) to 0–8 (major general/rear admiral). Each of the Services has established a well-defined acquisition career program for its officers. These include the Army's Materiel Acquisition Management (MAM) program, the Navy's Materiel Professional (MP) programs, and detailed career planning regulations for Air Force technical personnel and program managers. We strongly support these measures. We also support recent legislation that has further defined career paths for all program managers. In 1984, Congress established a minimum four-year tenure for program management assignments. The 1986 Authorization Act prescribed requisite qualifications and training, including at least eight years of acquisition-related experience and appropriate instruction at the Defense Systems Management College (or equivalent training).

A3 SECNAV INSTRUCTION 4210.6A, 13 April 1988, "ACQUISITION POLICY

1. Purpose. The purpose of this instruction is to promulgate policy guidelines that will improve and strengthen the acquisition process. These guidelines will enhance the full scale production decision process and provide a better management tool for ensuring a controlled transition from development to production.

2. Cancellation. SECNAV Instruction 4210.6.

3. Applicability. This instruction applies to all programs that will result in a Full Scale Engineering Development (FSED) acquisition phase and which are expected to transition to production.

4. Background. In recent years the costs of many Navy programs have been reduced dramatically through increased competition in all phases of acquisition. The policy set forth below is designed to complement existing acquisition instructions and to strengthen competition and identify additional areas where cost savings and better quality may be realized.

5. Policy

a. The development cycle of each program will begin with a minimum of two contractors/contractor teams performing concurrent, but separate development up to FSED at which time it will normally be narrowed to two contractors developing a system to one design.

b. The pre-FSED period will include risk reduction and cost-capability tradeoff efforts. An objective of this activity is to clearly identify and eliminate those capabilities which provide only marginal military worth when compared to cost and/or risk. After program initiation and prior to FSED, the program must include efforts to identify, control and reduce program risk. Technical, operational, schedule, and cost risks shall be identified as early as possible and assessed continuously. Industry must participate in risk reduction efforts to achieve a clear understanding of program objectives, to produce schedule realism and to identify appropriate incentives for the FSED effort. Contracting officers shall adhere to the principles on choice of contract type expressed in Part 35 of the FAR. In addition, the choice shall be consistent with all program characteristics including risk. The goal of risk reduction effort is to achieve sufficient confidence to establish a ceiling amount on the Government's liability in FSED contracts. If this goal cannot be achieved, the program may not yet be ready to proceed into FSED.

c. In accordance with references (a) and (b), FY 1988 funds may not be obligated on fixed price type contracts in excess of $10 million for the development of a major system or subsystem without written approval from the Under Secretary of Defense for Acquisition (USD(A)). For this purpose, a major system is defined as one for which the total expenditures are estimated to be more than $75 million RDT&E or more than $300 million in procurement based on FY 1980 constant dollars. Development contracts will normally be on a cost incentive sharing basis. The contract price should include the normal expected margin for changes during development. Changes beyond the scope included in the contract price will be considered through the Program Management Proposal (PMP) process outlined in reference (c).

d. The first production buy will normally be apportioned between the contractors, so that each contractor will have the capability to compete equally for production, subject to the Competition in Contracting Act.

e. Once production has been approved, contractors will be reimbursed for Production Special Tooling and Production Special Test Equipment (PST/PSTE) in accordance with the Department of Defense Federal Acquisition Regulation Supplement (DFARS).

6. Procedures

a. Changes in programs, both in research and development and in production, must be kept firmly under control. Following Milestone II, necessary changes and modernization in design must be made sparingly. Changes or modification requiring a performance specification or funding change will be presented for review in accordance with the PMP process. All such changes should be made in block upgrades for systems in production and for those already deployed. Exceptions in the block upgrade policy will be made for safety of flight and other emergencies.

b. Solicitations and contracts will be streamlined to eliminate over-specification and unnecessary requirements. For example, off-the-shelf equipment--down to nuts and bolts should be used whenever practical, and commonality of parts at the subsystem/component level is required, to the maximum extent possible, especially where multiple sources exist.

7. Responsibilities

a. The Systems Commanders, Director, Strategic Systems Programs, and Commanding General, Marine Corps Research, Development, and Acquisition Command are responsible for the successful implementation of their assigned programs, and as such will be held accountable for proper management, specification streamlining, efficiencies, and initiating requests for USD(A) approval of fixed price type developmental contracts (see paragraph 5. c. above). Communications with OSD, with the other Services, and within the Navy, will be maximized to eliminate

redundancy and duplication, and to increase commonality and quantity buys to achieve greater competition and lower costs. Rewards should be given to program managers and acquisition management personnel for demonstration of excellent performance.

b. Program managers are responsible to their Systems Commanders and will be held accountable for the successful implementation of their assigned programs. Program managers will ensure that program schedule and funding are consistent with the acquisition policies established herein from program inception through completion. These elements of program management are to be adjusted as necessary throughout the acquisition cycle. Such adjustments should be reflected in documentation included in the Planning, Programming and Budgeting System (PPBS) process, in the decision milestone process, and in the acquisition planning process.

c. Program managers will accept direction only in writing through the established chain of command, including ASN oversight. Program managers shall assure full communication with Program Sponsors in the Navy and Marine Corps, but this must stop short of accepting authoritative direction from them.

d. The following must occur prior to the FSED decision:

(1) The Chief of Naval Operations or Commandant of the Marine Corps shall certify that the results of cost-capability tradeoffs have been examined and that performance requirements that yield only marginal worth have been eliminated.

(2) The Competition Advocate General shall certify that the program's acquisition strategy provides for maximum effective, sustainable competition considering the unique nature of each acquisition.

(3) The Specification Control Advocate General must certify that the development specifications, including the contract data requirements list, have been reviewed and tailored to the operational requirements.

(4) The Commander of the responsible Systems Command must certify that the proposed hardware/software development reflects maximum practical commonality.

8. Exceptions

a. It is recognized that in certain circumstances some or all of the principles above may not apply. Pragmatic exceptions may need to be made in the case of small businesses, high risk or high priority programs. All such exceptions must be approved by the Navy Acquisition Executive and will not be delegated on ACAT I and II programs.

b. The uniqueness of the ship acquisition process is recognized in reference (d) and must be considered when implementing the policies of this instruction. Ship procurements will continue to be fully competitive, unless exceptions are authorized.

c. Program managers are encouraged to be creative and to consider alternate acquisition strategies which they feel may be more beneficial to the Navy than those discussed above. These strategies, along with any other request for waiver of this instruction, will be reviewed and approved/disapproved as a part of the acquisition approval cycle.

H. Lawrence Garrett, III
Under Secretary of the Navy

A4 EXCERPTS FROM THE SUMMARY OF MAJOR PROVISIONS OF THE GOLDWATER-NICHOLS DEPARTMENT OF DEFENSE REORGANIZATION ACT OF 1986 RELEASED BY THE SENATE COMMITTEE ON ARMED SERVICES 11 SEPTEMBER 1986

II-9* Transfers responsibility for ["assessing military requirements for acquisition programs" and various other duties] currently performed by the corporate JCS to the Chairman.

* * * *

V-5 Consolidates sole responsibility for [acquisition and various other functions] in each Service Secretariat.

V-6 Consolidates sole responsibility for research and development in each Service Secretariat but specifies that the Service Secretaries may assign to the military headquarters staffs responsibility for those aspects of research and development that relate to military requirements and test and evaluation.

V-7 Directs the Service Secretaries to prescribe the relationship of offices within the Secretariats responsible for these functions to the military headquarters staffs.

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V-11 Reduces [by 15%] the number of personnel serving in the Secretariat and military headquarters staff of each Military Department.

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VI-1 Reduces the number of defense reports required by the Congress from the President and the Defense Department by about two-thirds of the total.

VI-2 Reduces the number of personnel serving on the lower-level headquarters staffs of the Military Departments . . .

*Title II of the Act, paragraph 9 of the discussion of Title II

A5 INITIATIVES ON IMPROVING THE ACQUISITION PROCESS (THE THIRTY-TWO "CARLUCCI INITIATIVES")

In 1981, Deputy Secretary of Defense Frank Carlucci announced major changes both in the acquisition philosophy and the acquisition process as practiced by the then-new administration. Based on a 30-day review of the Defense acquisition system, the initiatives addressed major problems in system acquisition as perceived by Congress and the GAO, the OSD staff, the Services, and Program Managers. The major theme of the changes was to achieve enhanced readiness, reduced acquisition costs, and shortened acquisition time through controlled decentralization.

A detailed explanation of each of the initiatives was published in a DEPSECDEF Memorandum dated 27 July 1981. A list of the initiatives is republished here to illustrate the persistent nature of the issues affecting acquisition management.

1. **Management Principles** include improved long-range planning; greater delegation of responsibility, authority and accountability; emphasis on low-risk evolutionary alternatives; more economic production rates; realistic budgeting and full funding; improved readiness and sustainability; and strengthening the industrial base.
2. **Preplanned Product Improvement** should be used as a means of achieving performance growth.
3. **Multiyear Procurement** should be used, on a case-by-case basis, to reduce unit production costs.
4. **Increased Program Stability in the Acquisition Process** should be achieved by fully funding R&D and procurement in order to maintain the established baseline schedule.
5. **Encourage Capital Investment to Enhance Productivity** through legislative, contractual, and other economic incentives.
6. **Budget to Most Likely Costs** to achieve more realistic long-term defense acquisition budgets, reduce apparent cost growth and achieve increased program stability.
7. **Economic Production Rates** should be used whenever possible and advantageous.
8. **Assure Appropriate Contract** Type in order to balance program needs and cost savings with realistic assessment of contractor and Government risk.
9. **Improve System Support and Readiness** by establishing objectives for each development program and "designing-in" reliability and readiness capabilities.
10. **Reduce the Administrative Cost and Time to Procure Items** by raising the limit on purchase order contracts and reducing unnecessary paperwork and review.
11. **Incorporate the Use of Budgeted Funds for Technological Risk** by quantifying risk and incorporating budgeting techniques to deal with uncertainty.
12. **Provide Adequate Front-End Funding for Test Hardware** in order to emphasize early reliability testing and to permit concurrent development and operational testing when appropriate.
13. **Governmental Legislation Related to Acquisition** which unnecessarily burdens the acquisition or contracting process should be eliminated.

14. **Reduce the Number of DOD Directives** by performing a cost-benefit check and requiring that the DAE be the sole issuer of acquisition-related directives.

15. **Funding Flexibility** should be enhanced by obtaining legislative authority to transfer individual weapon system procurement funds to RDT&E when appropriate.

16. **Contractor Incentives to Improve Reliability and Support** should be developed and introduced into RFPs, specifications, and contracts.

17. **Decrease DSARC Briefing and Data Requirements** in order to increase the efficiency of DSARC and other program reviews.

18. **Budgeting Weapons Systems for Inflation** should be adopted in order to more realistically portray program cost.

19. **Forecasting of Business Base Condition at Major Defense Plants** by coordinating interservice overhead data and providing program projections to plant representatives.

20. **Improve the Source Selection Process** by placing added emphasis on past performance, schedule realism, facilitization plans, and cost credibility.

21. **Develop and Use Standard Operational and Support Systems** to achieve earlier deployment and enhanced supportability with lower risk and cost.

22. **Provide More Appropriate Design to Cost Goals** to provide effective incentives during early production runs.

23. **Assure Implementation of Acquisition Process Decisions** by initiating an intensive implementation phase.

24. **(ISSUE A) DSARC Decision Milestones** should be reduced to "Requirements Validation" and "Program Go-Ahead."

25. **(ISSUE B) MENS** should be submitted with Service POM thus linking the acquisition and PPBS process.

26. **(ISSUE C) DSARC** Membership should be revised to include the appropriate Service Secretary or Service Chief.

27. **(ISSUE D) The Defense Acquisition Executive (DAE)** should continue to be the USDRE.

28. **(ISSUE E) The Criterion for DSARC Review** should be increased to $200 M RDT&E and $1 B procurement in FY80 dollars.

29. **(ISSUE F) Integration of the DSARC and PBBS Process** will be achieved by requiring that fiscally executable programs be presented for DSARC review.

30. **(ISSUE G) Logistics and Support Resources** will be included in the Service POM by weapon system, and Program Managers will be given more control of support resources, funding and execution.

31. **(ISSUE H) Improved Reliability and Support** for expedited ("Fast Track") programs will be achieved by requiring an early decision on the additional resources and incentives needed to balance the risks.

32. **Increase Competition** in acquisition by establishing management programs and setting objectives. (July 27, 1981).

APPENDIX B
THE NAVY AND DOD DIRECTIVE SYSTEMS

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Appendix B
THE NAVY AND DOD DIRECTIVE SYSTEMS

The Department of the Navy Directives Issuance System consists primarily of two types of directives: instructions, which are directives of a continuing nature and are effective until cancelled; and notices, which are directives of a one-time nature, or are applicable for a brief period, usually 6 months or less. Notices contain a provision for their own cancellation.

B1 SCOPE AND PURPOSE

Directives serve two purposes. First, they prescribe or establish policy, organization, methods, or procedures; and second, they require action or contain information essential to the effective administration or operation of activities concerned. All Department of the Navy directives are issued in the Navy Directives Issuance System with the following required exceptions.

1. Top Secret directives
2. Joint Army-Navy-Air Force publications (JANAP's) which are numbered serially
3. Registered publications
4. Plans issued under the Navy Planning System

Optional exceptions to the Navy Directives System are:

1. Military operational releases
2. Book-type publications (manuals and technical publications)
3. Directives addressed to less than six addressees, including "Copy to" addressees. (In this connection primary consideration should be given to content rather than number of addressees.)

B2 NUMBERING OF NAVY DIRECTIVES

Navy Directives are numbered in accordance with the classification system described in SECNAV Instruction 5210.11, "Department of the Navy Standard Subject Identification Codes." Additional information on this subject may be found in C9.

Numbers preceding the decimal point denote the subject of the directive, while the numbers following the decimal are consecutive numbers assigned by the issuing office. Letters following the consecutive number indicate the revision. For example, in OPNAV Instruction 3960.10C, the 3960 indicates that the directive is on the subject of test and evaluation. The 10 indicates that it was the tenth instruction issued by OPNAV on that subject, while the C indicates it is the third revision of OPNAV Instruction 3960.10.

Ref.: SECNAV Instruction 5210.11

B3 IDENTIFYING AND OBTAINING INSTRUCTIONS

Identifying all directives concerning a particular subject matter may prove to be more difficult than anticipated. Once the required

directives have been identified, obtaining copies is relatively easy. Each bureau, office and systems command maintains a directives control point for the purpose of supplying directives to their activity. Such points also are maintained by the Chief of Naval Operations and the Secretary of the Navy. When new directives arrive at an organization's directive control point, copies are routed to the various sections. Additional copies may be obtained as needed through the directive control point, or through the central stocking point, Naval Publications and Forms Center, Philadelphia, Pennsylvania 19120-5099.

B3.1 Navy Consolidated Subject Index. The largest problem is identifying the specific directives which provide guidance on a particular subject. The primary aid for identifying directives pertaining to particular subjects is the current edition of NAVPUB Notice 5215, "Consolidated Subject Index," which is issued semiannually. Each edition also includes a numerical list of effective instructions. This document provides a guide to the subject matter of unclassified instructions issued by DON components and distributed to addressees outside the originating office. It usually is effective in identifying directives dealing with listed subjects.

A still greater difficulty is identifying directives which affect subjects which are not the principal subject of the directive. If an attempt were being made to identify directives dealing with "Reprogramming of appropriated funds," the most important directive on the subject is NAVCOMPT Instruction 7133.1, "Procedures and Reporting Requirements Related to the Reprogramming of Appropriated Funds; implementation of." The search also could be narrowed considerably by reviewing the "Financial Management" 7000-7999 section of SECNAV Instruction 5210.11, "Department of the Navy Standard Subject Identification Codes," where it could be determined that a "reprogramming" instruction would be numbered 7133. However, the "Reprogramming" instruction covers other matters related to the subject, but which also are important to other areas. As a case in point, consider the following paragraph from DOD Directive 7250.5, "Reprogramming of Appropriated Funds," which is implemented by and is an enclosure to NAVCOMPT Instruction 7133.1:

> **POLICIES**
>
> 1. **General.** The congressional committees concerned with the Department of Defense Appropriation Acts and the authorizing Acts related thereto and the Department of Defense generally have accepted the view that rigid adherence to the amounts justified for budget activities or for subsidiary items or programs may unduly jeopardize the effective accomplishment of planned programs in the most businesslike and economical manner, and that unforeseen requirements, changes in operating conditions, revisions in price estimates, wage rate adjustments, etc., require some diversion of funds from the specified purposes for which they were justified. Reprogramming measures, developed in consultation with the committees, are both necessary and desirable, and will provide a firm basis for retention of congressional control over the use of Defense appropriations by assuring that the congressional intent is carried out while, at the same time, providing a timely device for achieving flexibility in the execution of Defense programs.

The above information could be retrieved through use of the Funds or Reprogramming sections in two different publications. If, however, one were using these two publications to gather instructions relating to Congressional committees and their relationship to Research and Development, this instruction would not be listed. The Consolidated Subject Index does not include this instruction either in the Committee section or the Congressional section.

B4 DOD DIRECTIVE SYSTEM

The DOD directive numbering system is based on issuing offices within the Office of the Secretary of Defense rather than on subject matter. Thus, there is no direct relationship between the DOD and the Navy systems.

DOD directives requiring direct implementing action within the Department of the Navy are implemented by Navy directives. Often the DOD directives are included as enclosures to the implementing Navy directive.

Ref.: DOD Directive 5025.1

B4.1 DOD Annual Listing. The Office of the Secretary of Defense provides a publication, *DOD Directive System Annual Index* (DOD 5025.1-I). Part I is a numerical Index; Part II is a subject index.

Ref.: DOD 5021.1-I, DOD Directives System Annual Index issued by OASD (Administration), Directives Division, Correspondence and Directives Directorate

Appendix C
CLASSIFICATION SYSTEMS

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Appendix C
CLASSIFICATION SYSTEMS

This section presents several classification systems. Some are employed in RDT&E management and others affect RDT&E indirectly. These classification systems provide perspectives of the Department of Defense from several points of view.

C1 SOME THEORETICAL ASPECTS OF CLASSIFICATION SYSTEMS

C1.1 Function and Utility of Classification Systems. Classification systems are critical to management. The more appropriate the classification systems, the more manageable is the effort. Managers are responsible for achieving their mission goals using a fixed amount of resources; or, conversely, they are responsible for accomplishing a fixed task with minimum possible resources. To achieve such efficiency, managers must achieve optimum "balance" within their programs, i.e., the resources available to them must be employed in the most productive way. In other words, executives make "tradeoffs," or move resources within their programs to put them to their most productive use. Classification systems provide both the key to detecting program imbalances and opportunities to increase effectiveness through tradeoffs (see 4.4.1).

A classification system generally is designed to meet a specific need of a particular user. No single classification system can be designed to meet the needs of all users. An understanding of classification systems can aid program managers in selecting the system(s) that will best meet their needs.

C1.2 Criteria for Classification Systems. Criteria useful for evaluating classification systems include:

- It must be useful. It must display information in a manner which will permit a manager to make decisions with confidence that all relevant information is available and is accurately displayed.
- It must be simple.
- The elements of the system must be mutually exclusive; otherwise, decisions based on the system can be ambiguous.
- Elements must be symmetrical. This means that elements not conveying similar concepts should be discarded or replaced. For example, if one were to classify materials and an element appeared which dealt with human factors, it would be readily apparent that it was out of place.
- Elements must cover the entire spectrum of the subject matter being classified.
- The system should be expandable to accommodate new concepts and disciplines.
- The system must be convertible. This enables the decision maker to shift readily from one system to another and thereby deriving a different perspective concerning the same subject.
- It should lend itself to electronic or mechanical accumulation of data. As classification systems pass from a higher to a lower organizational level the degree of detail in a specific area increases. In this transition the mass of data required to

fulfill the needs of the system increases to such an extent that it is essential that a classification system be capable of computerization.

C2 QUALITIES OF BASELINE COST ESTIMATES

Cost judgments are made by comparing actual costs to a criterion termed a "baseline cost estimate." Categories have been established for rating the quality of these baseline estimates.

C2.1 Estimates for Use in SARs. In Selected Acquisition Reports (SARs), cost estimates are defined as follows:

- Planning Estimate (PE)—The baseline estimate for technical and operational characteristics, schedule milestones, and program acquisition cost developed for the approved program before Milestone II (full-scale development (FSD) decision). Program acquisition costs are reflected by specific appropriation.
- Development Estimate (DE)—The baseline estimate of technical and operational characteristics, schedule milestones, program acquisition cost and annual production rates developed for the approved program at or subsequent to Milestone II (full-scale development decision) but prior to the first Milestone III decision (production).
- Production Estimate (PdE)—The baseline estimate of technical and operational characteristics, schedule milestones, and program acquisition cost developed for the approved program before Milestone II (full-scale development (FSD) decision).
- Current Estimate (CE)—A DOD activity's latest forecast for technical and operational characteristics, schedule milestones, program acquisition cost, and annual production rates for acquiring the approved program.

Ref.: DOD Instruction 7000.3 (SECNAV 7700.5)

C2.2 Measures of Cost Estimate Confidence. The following standards are prescribed for use with cost estimate documents in the "Cost Estimate Documentation Summary" (NAVMAT Form 7000/2 (7/76)):

Class A—Detailed Cost Estimate (Post budget—contract estimates). Estimate based on contract plans and evaluation of firm quotations for major material items.

Class B—Bid Evaluation Cost Estimate (Post budget—contract estimates). Estimate based on contract plans and evaluation of contractor RFP-based bids.

Class C—Budget Quality Estimate. Estimate based on an engineering analysis of detailed characteristics of item under consideration.

Class D—Feasibility Estimate. Estimate based on technical feasibility studies and/or extrapolated from higher quality estimates of similar items.

Class E—Computer Estimate. Estimate developed using a computer model and based on cost estimating relationships and general total parameters.

Class F—"Ball Park" Estimate. Quick cost estimates prepared in absence of adequate design and cost information and based on general parameters.

Class X—Directed or Modified Cost Estimate. Estimate not developed by System Commands through normal cost estimating processes.

Ref.: OPNAV Instruction 7000.17; DON Programming Manual, Appendix J

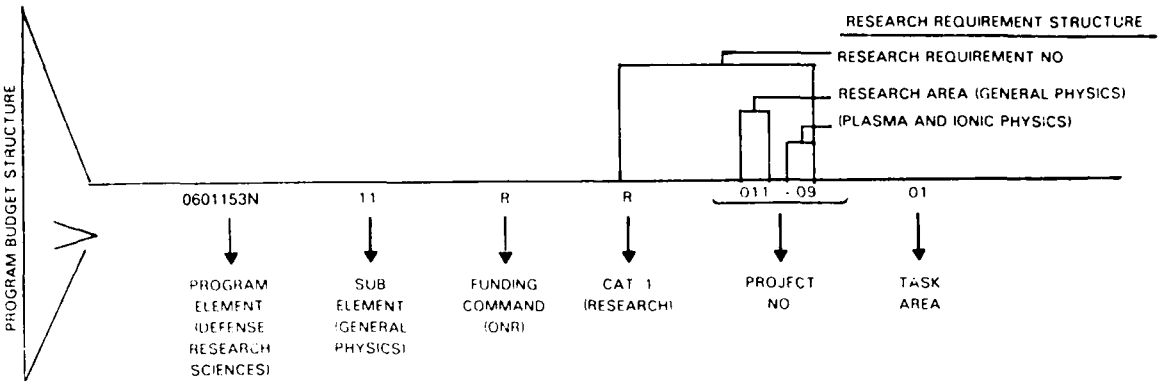

Exhibit C-1
Research Program/Budget Structure

C3 NAVAL RESEARCH PROGRAM STRUCTURE

The structure for the Navy's Research (6.1) Program is issued by the Chief of Naval Research. It is used for planning and programming research throughout the Department of the Navy. The numbering system for specific elements is depicted graphically in Exhibit C-1.

Ref.: ONR Instruction 3910.2

C3.1 Program Building Blocks.

C3.1.1 Program elements. The Research Program Structure consists of three program elements (note that Research (6.1) Programs have a 0601 prefix):

0601103N—University Research Initiative
0601152N—In-House Laboratory Independent Research
0601153N—Defense Research Sciences

C3.1.2 Research Program sub-elements. The program is structured around the following seventeen sub-elements:

11—General Physics
12—Radiation Sciences
13—Chemistry
14—Mathematics
15—Computer Sciences
21—Electronics
22—Materials
23—Mechanics
24—Energy Conversion
31—Ocean Sciences
32—Ocean Geophysics
33—Atmospheric Sciences
34—Astronomy and Astrophysics
41—Biological and Medical Sciences
42—Behavioral Sciences
51—University Research Instrumentation
52—Multidisciplinary Support

C3.1.3 Research sponsor/claimant codes. All elements of the Research Program are identified to sponsoring organizations by letter codes:

M—Naval Medical Research and Development Command (NAVMEDRSCHDEVCOM)
R—Office of the Chief of Naval Research (OCNR)
Y—Naval Facilities Engineering Command (NAVFACENGCOM)

C3.1.4 Subprojects/task areas. Projects are further subdivided into subprojects task areas, by each funding activity (Office or Command).

C3.2 Naval Research Requirements. Research Requirements are identified by a five-digit "R" number in which the second and third digits'

indicate the Naval Research Area (the seventeen Defense Research Sciences' sub-elements or the In-House Laboratory Independent Research Element). The fourth and fifth digits indicate the specific Research Requirement or discipline within the related Naval Research Area. For example:

R031 — Ocean Sciences Research Area
R-031-01 — Ocean Science Engineering
R-031-02 — Ocean Biology
R-031-03 — Oceanography.

C4 EXPLORATORY DEVELOPMENT PROGRAM PLANNING STRUCTURE

The Exploratory Development (6.2) Program Planning Structure is set forth by the Chief of Naval Research for use in planning and programming Navy-wide Exploratory Development. The Exploratory Development Program is managed by the Office of Naval Technology (ONT), an organization of the Office of the Chief of Naval Research (OCNR).

Ref.: OCNR Instruction 3910.3

C4.1 Program Building Blocks

C4.1.1 Program elements. Program elements (PE) are the smallest subdivisions of the R&D program considered in the DOD programming system. The Exploratory Development Program, structured along naval mission area lines, provides funding by program elements which approximate as closely as possible the mission areas. Naval warfare mission areas and corresponding Exploratory Development mission areas are shown in Exhibit C-2: (Note that Exploratory Development (6.2) programs have an 0602 prefix). Similar, or closely related warfare mission areas are funded under the same program element. Each mission area is subdivided by the technology thrusts required to meet its objectives. Technology thrusts, in turn, are supported by one or more technical projects, combinations of which are contained in a block program.

Program Element 0602XYZ

where:

X = 1 For ONT AAW/AWUW/SAT Directorate (ONT Code 21)

2 For ONT Support Techologies Directorate (ONT Code 22)

3 For ONT ASW/UT Directorate (ONT Code 23)

4 For ONT Ocean Science and Technology Directorate (ONT Code 24)

9 For ONT Chief Scientist (ONT Code 2OT)

Y = 1 For warfare-related technology

2 For platform-related technology

3 For multi-application technology

X = As required to ensure uniqueness of last two characters of PE number for each reference

Each project addresses one technical thrust.

See paragraph C4.2 for program elements within the Exploratory Development Program.

C4.1.2 Technology thrusts. Technology thrusts define the operational objectives to be achieved through a combination of technologies, and establish the objectives of the Block Program which support such technology thrust. Each technology thrust has a single operational and/or performance objective which supports the warfighting objectives of its mission area. A technology thrust may draw on several blocks and several projects within each of those blocks to meet its objectives.

C4.1.3 Block program. A block program comprises an integrated group of technology

Warfare Mission Area	6.2 Mission Area	Program Element
AAW — Antiair Warfare	AAW*	0602111N
ASU — Antisurface Ship Warfare	ASUW*	0602111N
STW — Strike Warfare		
ELW — Electronic Warfare	EW	0602113N
ASW — Antisubmarine Warfare	ASW*	0602314N
MIW — Mine Warfare	MW*	0602315N
NSW — Naval Special Warfare	SPW	0602315N
AMW — Amphibious Warfare	AMW	0602131M
MOB — Mobility	Ships	0602121N
	Aircraft	0602122N
	Submarines	0602323N
	Nuclear Propulsion	0602324N
CCC — Command Control and Communications	C^3I	0602232N
INT — Intelligence		
CON — Construction	Mission Support**	0602233N
FSO — Fleet Support Operations		
LOG — Logistics		
NCO — Noncombat Operations		
STS — Strategic Sealift		
NONE	Systems Support***	0602234N
	Lab. Independent Exploratory Devel.	0602936N

*Includes Ocean and Atmospheric Support (P.E. 0602435N).
**Includes Ocean and Atmospheric Support (P.E. 0602435N), Personnel Training and Simulation, CBR and Logistic Technology
***Includes Electronic Devices, Materials, Human Factors and Computer Technology.

Exhibit C-2
Naval Warfare Mission Areas and Corresponding 6.2 Program Mission Areas

projects with closely related applications and/or technical objectives. These are assigned to a given lead Navy laboratory or Systems Command program manager. Typically, a Block program includes the overall Exploratory Development Program's efforts in a warfare technology area. The block is composed of a number of projects each of which may address a different technology thrust and/or mission area. Block programs are management entities designed to aggregate funding and program efforts to increase management efficiency and exploit the synergism of having similar tasks managed by a single Claimant and within a single management structure.

C4.1.4 Project. A project is a sub-division of a block program and is a technology development which addresses the objectives of a single technology thrust. Thus, projects generally are defined as either specific technology or warfare technology developments. The term *specific technologies* refers to an application of a science or engineering discipline, such as, radome material technology or laser communications technology. The term *warfare technology* refers to closely related warfare, weapons or platform objectives, such as, air-launched weaponry, surface ship technology, or airborne electronic warfare.

C4.2 Exploratory Development Program Elements. Program elements are indicated by the eight-character symbol shown below. (The numbering system is described in Exhibit C-3, which follows).

0602111N AAW/ASUW Technology

0602113N Electronic Warfare Technology

0602121N Surface Ship Technology

An Exploratory Development effort	F
in the "Missile Propulsion" Program Group	31 (PE0602331N)
in the "Weaponry" Functional Area	300
in the "Weapon Propulsion and Explosives" Functional Subarea	330
in specific Project Area "Solid Propulsion"	332
has Project Number	F 31 332
The portion performed by NAVAIR	W
has Subproject Number	WF 31 332

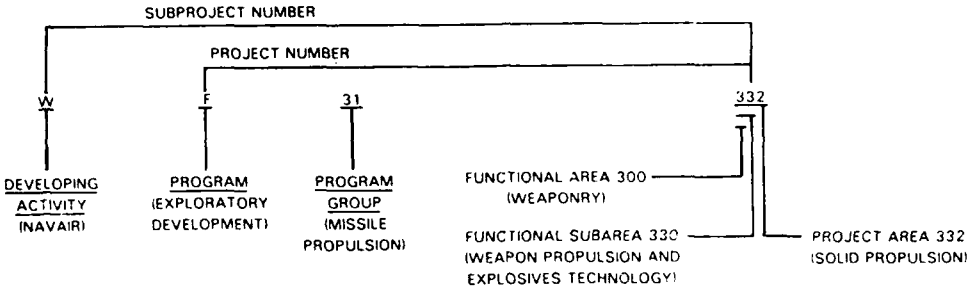

Exhibit C-3
Exploratory Development Program/Budget Structure

0602122N Aircraft Technology

0602131M Marine Corps Amphibious or Expeditionary Forces Technology

0602232N Command, Control and Communications and Intelligence Technology

0602233N Mission Support Technology

0602234N Systems Support Technology

0602314N ASW Technology

0602315N Mine and Special Warfare Technology

0602323N Submarine Technology

0602324N Nuclear Propulsion Technology

0602435N Ocean and Atmospheric Support Technology

0602936N Laboratory Independent Exploratory Development

Ref.: DON Programming Manual, Annex 2

C5 MISSION NEED CLASSIFICATION STRUCTURES

Mission need classification structures (see 2.2.9.1) provide guidance for potential systems concepts and for developing the technology base. There is a number of such structures, developed more or less independently by organizations for their own purposes. Various efforts are underway to achieve some standardization of these structures, which if successful will benefit information flow and effective planning. Examples within DOD are the Marine Corps Science and Technology Objectives (STOs) (see 2.1.3.3 and 2.5.9), and the Navy Combat Readiness Criteria.

C5.1 Marine Corps Planning Categories. Marine Corps Science and Technology Objectives are set forth in the following categories:

STO 211 Close Combat (Direct Fire and Mobility)
- 211.1 Infantry Systems/Light Weapons
- 211.2 Armor
- 211.3 Anti-Armor/Material
- 211.4 Combat Mobility
- 211.5 Attack Helicopters

STO 212 Fire Support (Indirect Fire)

212.1 Cannon Artillery
212.2 Mortars
212.3 Rockets/Missiles
STO 213 Ground Air Defense
213.1 Weapons
213.2 Munitions
213.3 C3I
213.4 Support
STO 214 Land Mine Warfare
214.1 Mines
214.2 Barriers
214.3 Countermeasures
STO 215 Combat Support
215.1 Engineer
215.2 Nuclear/Biological/Chemical
215.3 Other Combat Support
STO 216 Combat Service Support
216.1 Supply
216.2 Maintenance
216.3 Other CSS
STO 220 Tactical Air Warfare
221 Counter Air
222 Close Air Support/Battlefield Interdiction
223 Interdiction/Naval Strike
224 Defense Suppression
225 Support
STO 235 Tactical Naval Warfare—Amphibious Warfare
235.1 Forces Afloat/Deployments
235.2 Prelanding Operations
235.3 Ship to Objective Projections
235.4 Conduct/Support of Operations Ashore
235.5 Redeployment
STO 250 Theater and Tactical C3I
254 Tactical Command and Control (C2)
255 Tactical Surveillance, Reconnaissance, and Target Acquisition
256 Tactical Communications
257 Electronic Warfare and Counter C3I
STO 261 Mobility—Air
261.1 Strategic
261.2 Tactical
STO 262 Mobility—Sealift
262.1 MSC/Commercial Ships
262.2 Service Force Ships
STO 491 USMC-Wide Support Manpower and Training
491.1 Manpower Requirements
491.2 Personnel Procurement
491.3 Personnel Management
491.4 Training
491.5 Performance

Ref.: MCO 3900.4

C5.2 Naval Unit Status Criteria. For purposes of assessing and reporting the status of Fleet units, OPNAV has established a three-level structure of unit status criteria which are well suited for structuring RDT&E needs. The unit status reporting structure has fifteen mission areas at the top level which are broken out into "Operational Capabilities" at the next level. Most of these operational capabilities are broken out further into more detailed statements of "Suboperational Capabilities." For example, the "Anti-Air Warfare" mission area includes the Operational Capability, "Engage airborne threats using surface-to-air armament," which includes the Suboperational Capability, "Engage airborne threats using installed AA weapons."

C6 APPROPRIATIONS CLASSIFICATIONS

The appropriations classification structure is used for budget development and budget presentation to the Congress.

C6.1 DOD Budget Structure. The following titles and subdivisions are used in budgetary and fiscal presentations:

- Military Personnel
  - Active Forces
  - Reserve Forces
- Operation and Maintenance

- Procurement
  --Aircraft
  —Missiles
  —Ships
  —Combat Vehicles, Weapons, and Torpedoes
  —Ordnance, Vehicles, and Related Equipment
  —Electronics and Communications
  —Other Procurement
- Research, Development, Test, and Evaluation (see C6.2)
- Military Construction
- Trust Funds
- Trust Revolving Funds
- Military Functions
- Civil Functions
- Family Housing
- Revolving and Management Funds
- Other Accounts.

Ref.: DON Budget Guidance Manual (NAVCOMPT 7102.2)

C6.2 RDT&E Budget Activities. The RDT&E appropriation request is organized by mission-oriented budget activities in accordance with the Congressional Budget and Impoundment Control Act of 1974 (see 4.4.5). Definitions of budget activities are as follows:

1 Technology base. This activity finances basic research and exploratory development with the primary objective of increasing fundamental scientific knowledge adaptable to solving needs of widely varying future requirements.

2 Advanced technology development. This activity finances exploration of options and concepts prior to development of specific weapons systems. New technological developments are pursued which are not formally identified to specific operational requirements. This effort includes feasibility demonstrations of innovative concepts and emphasizes hardware competition in pursuit of optional solutions to potential military problems.

3 Strategic programs. This activity finances all R&D efforts on strategic offensive, defensive, and control systems.

4 Tactical programs. This activity finances advanced engineering and operational systems development related to all conflict levels of tactical warfare.

5 Intelligence and communications. This activity finances advanced, engineering, and operational systems development in intelligence and worldwide communications.

6 Defense-wide mission support. This activity finances efforts in support of installations or operations required for use in general research and development and not allocable to specific missions. Included are technical integration efforts, technical information activities, major test ranges, test facilities and general test instrumentation, target development, support of user tests, international cooperative R&D, and other R&D support.

Ref.: NAVCOMPT Manual, Vol. 7, Para. 074401

C7 DOD PROGRAMMING SYSTEM CLASSIFICATIONS

C7.1 Major Programs.

1 Strategic Forces
2 General Purpose Forces
3 Intelligence and Communications
4 Airlift and Sealift
5 Guard and Reserve Forces
6 Research and Development
7 Central Supply and Maintenance
8 Training, Medical, and other General Personnel Activities

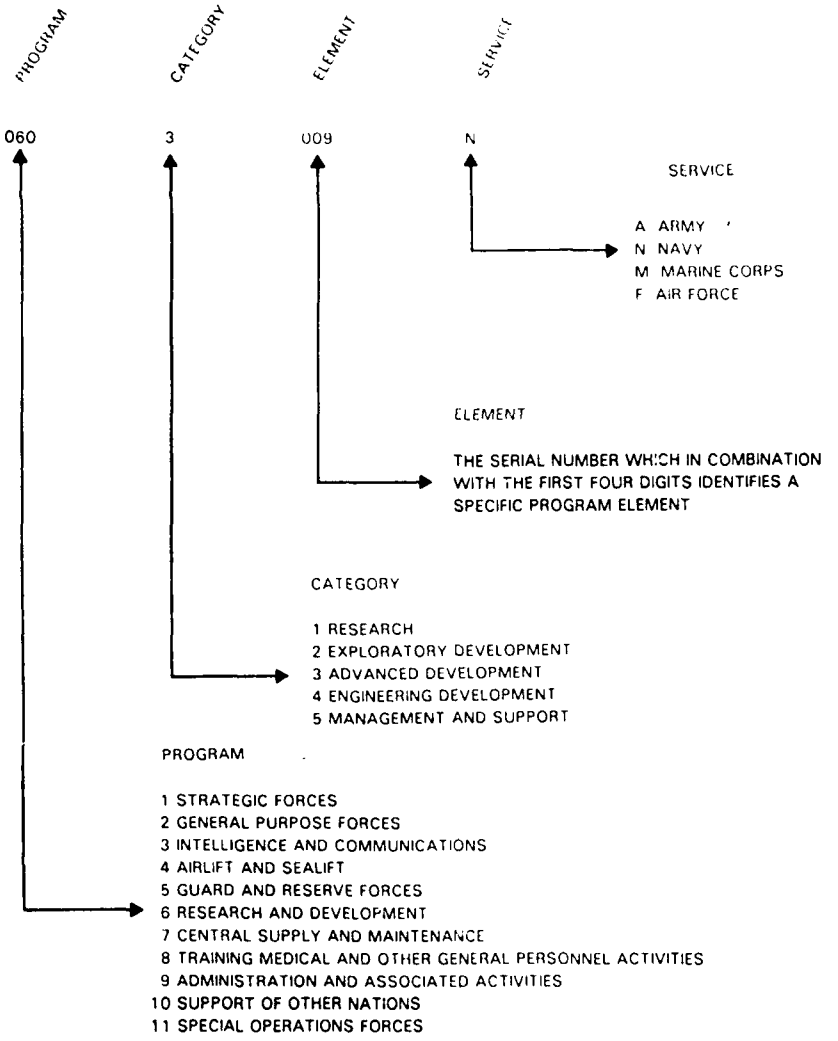

Exhibit C-4
Example of Program Element Numbering

9 Administration and Associated Activities
10 Support of Other Nations
11 Special Operations Forces

Ref.: DON Programming Manual

C7.2 Program Element

A program element is the basic building block of the Five-Year Defense Program (FYDP). It describes the mission to be undertaken and identifies the organizational entities responsible for performing the mission. Elements may consist of forces, manpower, materials (both real and personal property), services, and associated costs. The list of Navy's program elements is detailed in the *DON Programming Manual*.

Program elements are identified by a eight-character symbol as shown graphically in Exhibit C-4.

C8 STANDARD COST DEFINITIONS

The unit procurement costs of weapon systems can vary substantially, depending on what

factors are included in the cost figures. To eliminate confusion, the following standard cost definitions have been established:

- Flyaway Cost
  - Basic Unit (airframe, hull, chassis, frame and so forth.
  - Propulsion Equipment
  - Electronics/Avionics
  - Armament
  - Installed Government-Furnished Equipment
  - Other Level 3 Work Breakdown Structure Hardware/Software Subsystem Elements
  - System Project Management and System Test (as appropriate)
  - Nonrecurring and Recurring Production Costs

- Weapon System Cost
  - Flyaway Cost (see above) plus:
  - Peculiar Ground Support Equipment
  - Peculiar Training Equipment
  - Data (Publications, Technical)
  - Contractor Plant and Field Services
  - Installation and Checkout

- Procurement Cost (as shown in SAR) includes:
  - Weapon System Cost (see above) plus:
  - Initial Spares
  - Outfitting Post Delivery, Cost Growth, Escalation, and Ship Contract Design (Navy Shipbuilding Only)

- Program Acquisition Cost (as shown in SAR) includes:
  - Procurement Cost (see above) plus:
  - RDT&E
  - MILCON.

Ref.: DON Budget Guidance Manual (NAVCOMPT 7102.2)

C9 DEPARTMENT OF THE NAVY STANDARD SUBJECT IDENTIFICATION CODE

The Department of the Navy Standard Subject Identification Code provides a single coordinated system for classifying records, directives, correspondence, reports, forms, and other documents by subject.

Ref.: SECNAVINST 5210.11

C9.1 Major Subject Groups.

The major fourteen subject groups of the Navy's Standard Subject Identification Code relate to:

1000 Series—Military Personnel. Administration of military personnel. (Civilian personnel are included in the 12000 series. General personnel—including both civilian and military personnel—are in the 5000 series.)

2000 Series—*Telecommunications.* General communication matters and communication systems and equipment.

3000 Series—Operations and Readiness. Operational plans, fleet operations, operational training and readiness, warfare techniques, operational intelligence, research and development, geophysical and hydrographic support.

4000 Series—Logistics. Logistical support of the Navy and Marine Corps, including procurement, supply control, property redistribution and disposal, travel and transportation, maintenance, construction and conversion, production and mobilization planning, and foreign military assistance.

5000 Series—General Administration and Management. The administration, organization, and management of the Department of the Navy, including general personnel matters (concerning both civilian and military personnel), records

management, security, external and internal relations, audiovisual management, law and legal matters, office services, office automation, and publication and printing matters.

6000 Series—Medicine and Dentistry. Medical matters, such as physical fitness, general medicine, special or preventive medicine, dentistry, and medical equipment and supplies.

7000 Series—Financial Management. Financial administration of the Department of the Navy, including budgeting, disbursing, accounting, auditing, contract auditing, industrial and other special financing matters, and statistical reporting.

8000 Series—Ordnance Material. Ordnance material and weapons, including ammunition and explosives, guided missiles of all types, nuclear weapons, fire control and optics, combat vehicles, underwater ordnance materials, and miscellaneous ordnance equipment.

9000 Series—Ships Design and Material. The design and characteristics of ships, and ships material and equipment.

10000 Series—General Material. General categories of materials not included in the specialized material groups. This group includes audiovisual/graphic/arts/photographic/television/video equipment and accessories, general machinery and tools, personnel (materials), and miscellaneous categories.

11000 Series—Facilities and Activities Ashore. Ashore structures and facilities, transportation facilities, heavy equipment, utilities and services, and other similar subjects.

12000 Series—Civilian Personnel. The administration of civilian personnel. (Military-personnel subjects are included in the 1000 series; general information relating to both civilian and military personnel is included in the 5000 series.)

13000 Series—Aeronautical and Astronautical Material. Aeronautical and astronautical material, including parts, accessories, and instruments; special devices, armament; aerological equipment, weapon systems, types of aircraft; and astronautic vehicles.

16000 Series—Coast Guard Missions. Administration and mission of the Coast Guard. Not to be used by Navy or Marine Corps activities.

C9.2 Primary, Secondary, and Tertiary Numerical Subject Groups. The foregoing fourteen major numerical subject groups are sub-divided into primary, secondary, and sometimes tertiary breakdowns. Primary subjects are designated by the last three digits of the code number. For example, the major subject of General Administration and Management, coded 5000, is subdivided into primary groups as follows:

5000 General Administration and Management
- 5200 Management Programs andTechniques
- 5300 Manpower/Personnel
- 5400 Organization, Functions, and Status

Primary subjects are subdivided into secondary subjects by the last two digits of the numeric code. Tertiary breaks are indicated by the final digit. For example:

5200 Management Programs and Techniques
- 5210 Records Management
- 5211 Filing, Maintenance, Retrieval, and Privacy Act Systems

Some smaller subject groups are not sub-divided below the primary breakdown. Other larger subject groups are divided into many secondary and tertiary subjects, the extent depending upon the scope and complexity of the subject matter.

C9.3 RDT&E Subject Groups. The primary subject group, Research and Development, under major subject area, Operations and Readiness,

(3000 series), is subdivided into four secondary groups as follows:

3000 Operations and Readiness
3900 RDT&E, General
3910 Plans
3920 Programs
3930 Projects
3960 Tests and Evaluation.

C10 COSATI SUBJECT CATEGORY LIST

A classification system important in the reporting and retrieval of RDT&E information is that established by the Committee on Scientific and Technical Information (COSATI). This is a listing of major scientific and technical subjects, each with a number of second-level component areas. It was established by COSATI in an effort to arrive at a standardized, government-wide classification system to replace the multiplicity of systems now in existence. That goal has not yet been achieved; however, the list, variously modified, is in use in several Federal agencies. Most important for readers of this Guide, it is in use by DOD, in conjunction with the Defense Technical Information Center (DTIC), for reporting and retrieval of information at the working level for all scientific and technical work (DD 1498) and for information on Independent Research and Development. The major subject headings of the COSATI list (as modified by DTIC) are given below, with an example only of the subheadings under the first major subject. The numbering system shown is that used by DOD for task area, project, and work unit level reporting.

Ref.: DOD Manual 3200.12-M-1 Table 2-2

C10.1 Scientific and Technological Fields and Groups.

- Aeronautics
  - 000500 Aerodynamics
  - 000600 Aeronautics
  - 001300 Aircraft
  - 001400 Aircraft Flight Instrumentation
  - 001500 Air Facilities
- Agriculture
- Astronomy and Astrophysics
- Atmospheric Sciences
- Behavioral and Social Sciences
- Biological and Medical Sciences
- Chemistry
- Earth Sciences and Oceanography
- Electronics and Electrical Engineering
- Energy Conversion (Nonpropulsive)
- Materials
- Mathematical Sciences
- Mechanical, Industrial, Civil, and Marine Engineering
- Methods and Equipment
- Military Sciences
- Missile Technology
- Navigation, Communications, Detection, and Countermeasures
- Nuclear Science and Technology
- Ordnance
- Physics
- Propulsion and Fuels
- Space Technology
- Control, Guidance, and Navigation—Aerospace Vehicles, Missiles, Aircraft.

C11 WORK BREAKDOWN STRUCTURE

A work breakdown structure (WBS) is specified by DOD for application in contracting, planning, and reporting during the engineering development and subsequent stages of acquisition of a major system A work breakdown structure is a product-oriented "family tree" composed of

hardware, service, etc., which completely defines the project/program. It covers three levels of detail as illustrated by the partial sample of the Aircraft System summary WBS.

Level 1	Level 2	Level 3
Aircraft System		
	Air Vehicle	Airframe
		Power Plant
		Other Propulsion
		Communications
		Navigation/Guidance
		Fire Control
		Penetration Aids
		Reconnaissance Equipment
		Automatic Flight Control
		Central Integrated Checkout
		Antisubmarine Warfare
		Auxiliary Electronics Equipment
		Armament
		Auxiliary Armament/ Weapons Delivery Equipment
	Training	
		Equipment
		Services
		Facilities

Ref.: MIL-STD-881

C11.1 Ship Work Breakdown Structure (SWBS). NAVSEA has developed a further, detailed structure based upon Appendix E of MIL-STD-881. Its major groupings are an extension of the Level 3 subheadings under the WBS Level 2 heading "Ship." The system is cross-indexed to the 9000 series of the Standard Subject Identification Code (See C9.1) and to the Bureau of Ships Consolidated Index (BSCI) (NAVSHIPS 0902-002-2000) which it supersedes, but which still is used in historical data. It provides a single language which is used through the life cycle of the ship. Its use is illustrated below:

WBS Level 2	SWBS Major Groups (WBS Level)
Ship	000 General Guidance and Administation
	100 Hull Structure
	101 General Arrangement-Structure (Subgroup) (Element)
	110 Shell and Supporting Structure (Subgroup)
	111 Shell Plating, Surface Ship and Submarine Pressure Hull (Element)
	112 Shell Plating, Submarine Non-Pressure Hull
	120 Hull Structural Bulkheads

Ref.: NAVSHIPS 0900-039- 9010

NOTE REGARDING DIRECTIVE NUMBERS

References to directives within this Guide are by series only; e.g., 3900.14, not to the effective edition within the series; e.g., 3900.14A.

The "Master Reference List" shows the version and issue date of each directive.

For recent information on the effective directive within a series, consultant "Department of the Navy Directives Issuance System: Consolidated Subject Index" (NAVPUBNOTE 5215).

Appendix D
TECHNICAL INFORMATION SERVICES

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Appendix D
TECHNICAL INFORMATION SERVICES

Programs, facilities, services, and organizations are available to meet the information needs of Navy RDA personnel and their contractors. The most important programs are described herein.

All Navy organizations performing, contracting, or authorizing scientific and technical work, studies are required by SECDEF and SECNAV to query the DOD RDT&E databases maintained at the Defense Technical Information Center (DTIC) prior to commencing new research or development activities (see D3.1.).

Ref.: DOD Regulation 3200.12-R-1

D1 SCIENTIFIC AND TECHNICAL INFORMATION PROGRAM (STIP)

The Department of Defense operates a comprehensive, coordinated STIP to ensure that such information contributes to the advancement of science and technology; permits timely and efficient conduct and management of DOD research, engineering, and studies programs; eliminates duplication of effort and waste of resources; and encourages and expedites the interchange and use of scientific and technical information (STI). The STIP provides for interchange of STI within and among DOD organizations and their contractors federal agencies and their contractors, and the national and international scientific communities.

Ref.: DOD Directive 3200.12 (SECNAV 3900.43); SECNAV Instruction 3900.43

D2 NAVY TECHNICAL LIBRARIES

Navy (and DOD) technical libraries are vital to the RDT&E process. They are the access points to most of the major technical information services, provide direct access to reports, books, periodicals, and other established library facilities and services tailored to users' technical needs.

Navy terminals for the Defense RDT&E On-Line System (DROLS) are located in the technical libraries so that library staffs can assist RDT&E personnel. If a technical library does not have an online terminal to DTIC, the librarian will assist in formulating DOD RDT&E database queries, which are then sent to DTIC for processing. Search results are returned by mail.

As a general rule, information-gathering efforts should begin by discussions with the activity librarian.

D3 DEFENSE TECHNICAL INFORMATION CENTER (DTIC)

The DTIC provides STIP services to assist in carrying out STIP policy and administration, operates DOD-wide systems, and serves as a central coordinating point for DOD STI databases.

Ref.: DOD Directive 3200.12 (SECNAV 3900.43)

D3.1 DOD RDT&E Databases. Three DOD RDT&E databases are operated by DTIC. These databases contain information summaries of on-going work, industry Independent Research and Development (IR&D), and technical reports.

D3.1.1 Work Unit Information System (WUIS) Database. This database provides information on on-going Defense-sponsored research and technology performed at DOD facilities or by contracts and grants or agreements. DOD organizations provide information described on Research and Technology Work Unit Summaries (DD Form 1498) in machine-readable form. Historical information also can be compiled from this database.

Ref.: DOD Regulation 3200.12-R-1; DOD Manual 3200.12-M-1

D3.1.2 IR&D Database. This database contains proprietary information on Defense-related work from companies in the Independent Research and Development (IR&D) program. Because this information is proprietary, use is limited to authorized DOD personnel only. DOD contractors provide annual reports on their IR&D programs. Descriptions of individual projects are summarized on DTIC Form 271, which provides information similar to that shown on DD Form 1498.

Ref.: DOD Instruction 3204.1 (SECNAV 3900.40); SECNAV Instruction 3900.40

D3.1.3 Technical Reports Database. This database contains bibliographic citations with abstracts and other information on DOD-sponsored scientific and technical reports submitted to DTIC. DOD organizations and contractors submit this information on DD Form 1473.

In addition, DTIC also obtains, stores, retrieves, and provides secondary distribution of scientific and technical documents directly to registered users.

Ref.: MIL-STD-847 (SECNAV 3900.29); NISO Std 239.18

D3.2 DTIC Products and Services

D3.2.1 Defense RDT&E On-Line System (DROLS). Remote computer terminals provide online access to the above DOD RDT&E databases. Location of these Navy terminals can be obtained from technical libraries or from DTIC.

DTIC-registered organizations in the Washington, D.C., Los Angeles, Albuquerque and Boston areas may make DROLS searches through terminals providing special access. These facilities are located at: DTIC, Cameron Station, Alexandria, Virginia; Defense Contract Administration Services Region, 11099 La Cienega Boulevard, Los Angeles, California; Building 1103, Hanscom Air Force Base, Bedford, Massachusetts; and Air Force Weapons Laboratory/SUL, Kirtland AFB, New Mexico.

D3.2.2 Technical Reports Awareness Circular (TRAC). TRAC announces and provides reference and document-ordering information monthly on all of DTIC's newly access documents.

The citations are arranged in AD number order and include title, corporate author, personal author, contract, and report number indexes. News articles, important telephone numbers, and brief information on DTIC's products and services also are included. However, the TRAC does not contain abstracts or descriptors.

Semiannual and annual cumulative indexes are published on microfiche.

D3.2.3 Notices of changes in classification, distribution, and availability. Notices are published quarterly on microfiche, with the fourth quarter being an annual cumulative issue.

D3.2.4 Technical Report Secondary Distribution Service. Registered users may obtain technical reports in either hard copy or microfirm. Documents may be ordered online via DROLS (see D3.2.1), by phone, or by forwarding a Document Request (DTIC Form 1).

3.2.5 Automatic Document Distribution (ADD). DTIC offers an Automatic Document Distribution service which provides microfiche copies of recent documents meeting a user's subject interest profile.

D3.2.6 Bibliographies. These are listings of technical reports related to specific subjects. A computerized search is made of the DTIC collection listing applicable reports with control numbers, informative abstracts, and descriptive data.

The three main types of DTIC bibliographies offered are Demand, Current Awareness and Direct Response. They differ in depth of search, response time. and product format.

Demand Bibliography—A tailor-made literature search conducted at the request of a user.

Upon request, DTIC will make a computer search to locate technical reports pertinent to a user's research problem or project. The requesting organization specifies the time parameters of search.

Current Awareness Bibliography—A customized, automated bibliography service based on recurring subject needs of DTIC users. Semimonthly, the user's subject interest profile is matched against information contained in documents.

Direct Response Bibliography—A tailored response to a specific request received in writing or by the Telex Telecommunications System at Headquarters, DLA.

D3.2.7 WUIS and IR&D reports. In a manner similar to bibliographies, reports from the Work Unit Information System (WUIS) (see D3.1.1) and/or Independent Research and Development (IR&D) reports (see D3.1.2) can be obtained either on a demand or recurring basis.

D3.2.8 Referral service. DTIC's referral service provides information concerning DOD-sponsored specialized sources of scientific and technical knowledge. When users require information exceeding DTIC data, this service directs them to other expertise sources.

In addition, DTIC periodically issues a *Referral Data Bank Directory* which lists specialized scientific and technical information sources. These sources are operated or supported by the DOD or other Federal agencies. Organizations include information analysis centers, data centers, information offices, libraries, laboratories, testing directorates, and information exchanges. The directory gives detailed descriptive information on the subject areas, services and materials available, publications issued, and access limitations of each activity.

D3.3 Obtaining DTIC Services. Government research and development activities and their contractors, subcontractors, and grantees are eligible to receive most of the information from DTIC-based DOD databases. In addition, research and development organizations without current contracts may be eligible for service through a military service authorization under the Defense Potential Contractor Program.

There are collections, however, which contain proprietary information compiled for the specific purpose of DOD management decisions which are made available only to specified Defense activities.

All Navy (and DOD) activities are registered with DTIC. Normally, the Navy activity's librarian is the DTIC liaison.

To assist other organizations in acquiring DTIC services, the Center provides a Joint Services Regulation (DLAR 4185.10) and a manual (DLAM 4185.16), both entitled, "Certification and Registration for Access to DOD Scientific and Technical Information." This regulation provides the procedures and forms required for registration. Requests for the regulation or for additional information concerning DTIC should be addressed to:

Defense Technical Information Center
Attn: DTIC-FDRB
Building No. 5, Cameron Station
Alexandria, VA 22304-6145
Telephone:
Commercial: 703-274-6871,72
AUTOVON: 284-6871,72

Ref.: DLAR 4185.10; DLAM 4185.16

D4 INFORMATION ANALYSIS CENTERS (IAC's)

The Defense Department supports twenty-two centers for analysis of scientific and technical information. Thirteen are contractor-operated IAC's managed administratively and funded by the Defense Logistics Agency (DLA) and DTIC. Nine others are managed by other DOD activities. These Centers receive technical data from DOD laboratories and agencies possessing competence in the field of science and technology within which the particular Center functions. In addition, technical expertise is provided by scientists and engineers associated with appropriate research and development facilities.

Each center gathers information in its specialized area of interest; reviews, analyzes, evaluates, synthesizes, summarizes, and distributes it. These centers also provide critical reviews, state-of-the-art monographs, data compilations, answers to questions, and access to technical advice.

Most DOD IACs are on a service charge basis for both in-house and contract users. Information on the particular IAC most likely to have information for user problems may be obtained from DTIC. Contract data and information sources are included in the *DTIC Referral Data Base Directory* and the *Directory of Federally Supported Information Analysis Centers*. Both publications may be obtained from the Government Printing Office.

DOD Regulation 3200.12-R-2; DTIC/ TR-87/17 (AD-A184002)

D4.1 IAC Listing. Information on IACs may be obtained from the Program Manager for IACs, DTIC. Data from certain IAC's, marked by *, can be obtained through the DTIC DROLS (see D3.2.1).

Coastal Engineers Information Analysis Center
*Chemical Propulsion Information Agency
*Chemical Warfare/Chemical-Biological Defense Information Analysis Center
Cold Regions Science and Technology Information Analysis Center
Concrete Technology Information Analysis Center
*Crew Systems Ergonomics Information Analysis Center
Data Analysis Center for Software
DOD Nuclear Information Analysis Center
Tactical Weapons Guidance and Control Information Analysis Center
Hydraulic Engineering Information Analysis Center
*Infrared Information and Analysis Center
*Manufacturing Technology Information Analysis Center
*Metals and Ceramics Information Center
*Metal Matrix Composites Information Analysis Center

*Nondestructive Testing Information Analysis Center
*Plastics Technical Evaluation Center
Pavement and Soils Trafficability Information Analysis Center
Reliability Analysis Center
Soil Mechanics Information Analysis Center
Survivability and Vulnerability Information Analysis Center
Tactical Technology Center
*High Temperature Materials Information Analysis Center

D4.2 Test Technology Information Center (TTIC). Although not an official IAC, TTIC provides a similar service. TTIC maintains and disseminates information regarding research in the field of test technology. Services available on request to Federal agencies and Defense contractors are: (1) "customized" bibliographies, (2) dissemination of citations resulting from monthly data searches in response to specific information requests, and (3) data search of in-house and other publications in the field of RDT&E (particularly test technology). TTIC is located at:

Fleet Analysis Center
Naval Weapons Station, Seal Beach
Corona Annex
Corona, CA 91720
Telephone:
Commercial: 714-736-5000
AUTOVON: 933-0111

D5 NAVY ACQUISITION, RESEARCH AND DEVELOPMENT INFORMATION CENTERS (NARDIC)

The Navy Acquisition, Research and Development Information Centers (NARDIC) are the Navy's focal points for making R&D information regarding planning and requirements available to industry representatives who are registered to obtain DOD information. This effort is a part of the DOD Tri-Service Industry Information Program.

NARDIC has two offices: Alexandria, Virginia, and Pasadena, California. At Alexandria, NARDIC is co-located with counterpart Army and Air Force offices, creating a TriService Industry Information Center. At Pasadena the NARDIC is co-located with a counterpart Air Force office. Some information on DOD laboratories also is available at each TriService field office.

In the Washington, D.C. area, NARDIC is located in the Headquarters U.S. Army, Materiel Command (AMC). The address is:

Navy Acquisition, Research and Development Information Center
5001 Eisenhower Avenue
Alexandria, Virginia 22333-0001
Telephone:
Commercial: 202-274-9315
AUTOVON: 284-9315

On the West Coast, NARDIC is located in downtown Pasadena. The address is:

Navy Acquisition, Research and Development Information Center
525 South Lake Avenue
Suite 101
Pasadena, California 91101-3529
Telephone:
Commercial: 818-792-5182

Each NARDIC office provides a reading room where representatives of may review those documents of interest.

NARDIC services are available to industrial, scientific, or other organizations registered for access to DOD (DTIC) information services. An organization may register for DOD information services as either a contractor or prospective contractor.

D6 NAVY POTENTIAL CONTRACTOR PROGRAM (NPCP)

The NPCP is part of the DOD Potential R&D Contractor Program. It informs the scientific and technical community of R&D problems confronting the DOD and DON. The NPCP interchanges technical information with civilian scientists and engineers on a cooperative, no-cost, controlled basis.

Through NPCP agreements, classified and unclassified technical information on DON requirements and existing R&D is provided to nongovernment activities. NARDIC and DTIC services are available to NPCP participants. Participation is accomplished by executing a policy agreement with an NPCP focal point at a Navy R&D command. Firms or individuals with activities with substantiated R&D capability and a reasonable potential for receiving and executing a Navy contract are eligible. Additional information can be obtained from NARDIC offices (see D5).

D7 GOVERNMENT-INDUSTRY DATA EXCHANGE PROGRAM (GIDEP)

GIDEP interchanges technical data related to parts, components, and materials used in military and space systems. GIDEP does not require generation of new data. It simply ensures that technical data required to be delivered under a contract and already paid for is available to other program participants to make cost savings possible on a reciprocal basis.

GIDEP is sponsored by the Joint Logistics Commanders (JLCs). By agreement of the JLCs, central management is assigned to the DON's representative to the JLCs. The GIDEP Program Manager is assigned to the Office of the Assistant Secretary of the Navy (Shipbuilding and Logistics).

Although many organizations participate voluntarily, some government contracts require that contractors participate in GIDEP. Contractors may be required to participate in accordance with MIL-STD-1556B, a contract clause, or a statement of work.

In DOD and NASA organizations, participation in GIDEP may be mandatory through application of one of the following regulations:

- Navy OPNAV Instruction 5200.29
- Army AMC Regulation 70-56
- Air Force Regulation 80- 10
- NASA Management Instruction 5310.2

There are four GIDEP Data Interchanges:

a. Engineering Data Interchange—contains engineering evaluation and qualification test reports, nonstandard parts justification data, parts and materials specifications, manufacturing processes, and other related engineering data on parts, components, materials, and processes.

b. Reliability-Maintainability Data Interchange—contains failure rate/mode and replacement rate data on parts, components, and materials. Also includes reports on R&M practices and procedures.

c. Failure Experience Data Interchange—contains failure information on parts, components, processes, fluids, materials, and safety fire hazards. Also includes data from ALERT's as well as other problem information, failure analyses, and Diminishing Manufacturing Sources and Material Shortage (DMSMS) information.

d. Metrology Data Exchange—contains test equipment calibration procedures and metrology-related engineering data on test systems, calibration systems, and measurement technology.

DOD Value Engineering Data Information and Storage System (VEDISARS) has been implemented within GIDEP to collect, process, and make available DOD accepted Value Engineering Proposals (VEPs) and Value Engineering Change Proposals (VECPs).

An URGENT DATA REQUEST (UDR) system within GIDEP permits a participant with a specific technical problem to query rapidly the scientific and engineering expertise of all participating activities. A UDR form is initiated by the member and sent to the GIDEP Operations

Center for distribution to all participants. Responses are provided directly to the person making the query and are also incorporated into the appropriate data interchange.

Further information on GIDEP may be obtained from:

GIDEP Operations Center
Fleet Analysis Center (Code 30G)
Corona, CA 91720-5000
Telephone:
Commercial: 714-736-4677
AUTOVON: 933-4677

Ref.: OPNAV Instruction 5200.29

D8 NATIONAL TECHNICAL INFORMATION SERVICE (NTIS)

The National Technical Information Service (NTIS) of the Department of Commerce is the primary activity within the Federal Government for the collection, announcement, and dissemination of unclassified technical reports and data. Industry and the general public may purchase more than 50 products and services from NTIS.

Current abstracts of NTIS documents and other records of interest are published in weekly *Abstract Newsletters*. An all-inclusive biweekly journal, *Government Reports Announcements and Index*, is published and available on an annual subscription basis.

NTIS databases are accessible through commercial services. They can be searched at nominal cost through most Navy technical libraries.

Information on the NTIS services is available from local technical libraries or from:

National Technical Information Service
U.S. Department of Commerce
Springfield, Virginia 22161
Telephone:
Commercial: 703-487-4600.
AUTOVON: 933-4677

SELECTED REFERENCES ON TECHNICAL INFORMATION SERVICES

DOD Directive 3200.12 (SECNAVINST 3900.43), "DOD Scientific and Technical Information Program (STIP)."

DOD Regulation 3200.12-R-1, "Research and Technology Work Unit Information System Regulation."

DOD Regulation 3200.12-R-2, "Centers for Analysis of Scientific and Technical Information Regulation."

DOD Instruction 5200.21 (SECNAV 3900.35), "Dissemination of DOD Technical Information."

DOD Instruction 3204.1 (SECNAV 3900.40), "Independent Research and Development."

ANSI 239.18-1987, "Scientific and Technical Reports—organization, preparation, and production."

SECNAV Instruction 3900.29, "Standard Format Requirements for Scientific and Technical Reports."

SECNAV Instruction 3900.40, "Policy and Assignment of Responsibilities for the Independent Research and Development Program."

SECNAV Instruction 3900.43, "Navy Scientific and Technical Information Program (STIP)."

Appendix E
ORGANIZATIONS

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Appendix E
ORGANIZATIONS

E1 OFFICE OF THE SECRETARY OF DEFENSE (OSD)

The Secretary of Defense is supported by the Office of the Secretary of Defense. The responsibilities of assistant secretaries with major involvement in RDA are summarized in the following paragraphs with particular emphasis on the Under Secretary of Defense for Acquisition (see Exhibit E-1).

E1.1 Under Secretary of Defense (Acquisition) (USD(A)). USD(A) is the principal staff assistant and advisor to SECDEF for all matters relating to the acquisition system; research and development; production; logistics; command, control, communications, and intelligence activities related to acquisition; military construction; and procurement. USD(A)'s many functions and responsibility include:

- Serving as the Defense Acquisition Executive (DAE) (see E1.2)
- Setting policy for acquisition matters
- Serving as Chairman of the Defense Acquisition Board (DAB) (see E9.2)
- Reviewing proposed resource programs and budget estimates for acquisition programs (in conjunction with the DOD Comptroller and ASD(PA&E)).

His extensive authorities and relationships include direction "of the Military Departments and Heads of other DOD Components on policy, procedure, and execution of the acquisition system."

The many organizations which USD(A) is charged with providing "policy guidance, goal setting, and management supervision" include the Federally Funded Research and Development Centers (FFRDCs).

Officials reporting directly or indirectly to USD(A) include:

- Director of Defense Research and Engineering
- ASD (Production and Logistics)
- ASD (Command, Control, Communications, and Intelligence) for acquisition related activities.
- Assistant to the Secretary of Defense (ASTD) (Atomic Energy).

Activities under USD(A) include DARPA (see E1.1.1), DNA (see E1.6.1), DCA (see E1.6.2), DLA (see E1.6.5), DMA (see E1.6.7), and DSMC (see E5).

Ref.: DOD Directive 5134.1

E1.1.1 Defense Advanced Research Projects Agency (DARPA). DARPA is a separate agency under the Under Secretary of Defense (Acquisition). DARPA's mission is to:

- Manage and direct selected advanced basic and applied DOD R&D projects.
- Stimulate greater emphasis on prototyping in defense systems by conducting prototype projects that embody technology that

might be incorporated in joint programs, programs in support of deployed U.S. Forces (including the Unified and Specified Commands), or selected Military Department programs, and, on request, assist the Military Departments in their own prototyping programs.

Ref.: DOD Directive 5105.41

E1.2 Defense Acquisition Executive (DAE). The DAE is the principal advisor to the Secretary of Defense on all matters pertaining to the Department of Defense Acquisition System. The Under Secretary of Defense for Acquisition (USD(A)) is the DAE and:

- Establishes uniform policies and practices governing acquisition programs in general, and specific procedures, documentation requirements, and responsibilities for managing and reviewing major defense acquisition programs.
- Assures that the concepts, policies, and provisions of DOD Directive 5000.1 and OMB Circular A-109, "Major Systems Acquisition," are complied with and effectively administered throughout the Department of Defense.
- Chairs the Defense Acquisition Board (DAB).

Ref.: DOD Directives 4245.1, 5000.1, 5134.1

E1.3 Director of Operational Test and Evaluation (DOT&E). The DOT&E is the principal staff advisor and staff assistant to SECDEF on OT&E (see G2.2 for discussion of DOT&E responsibilities).

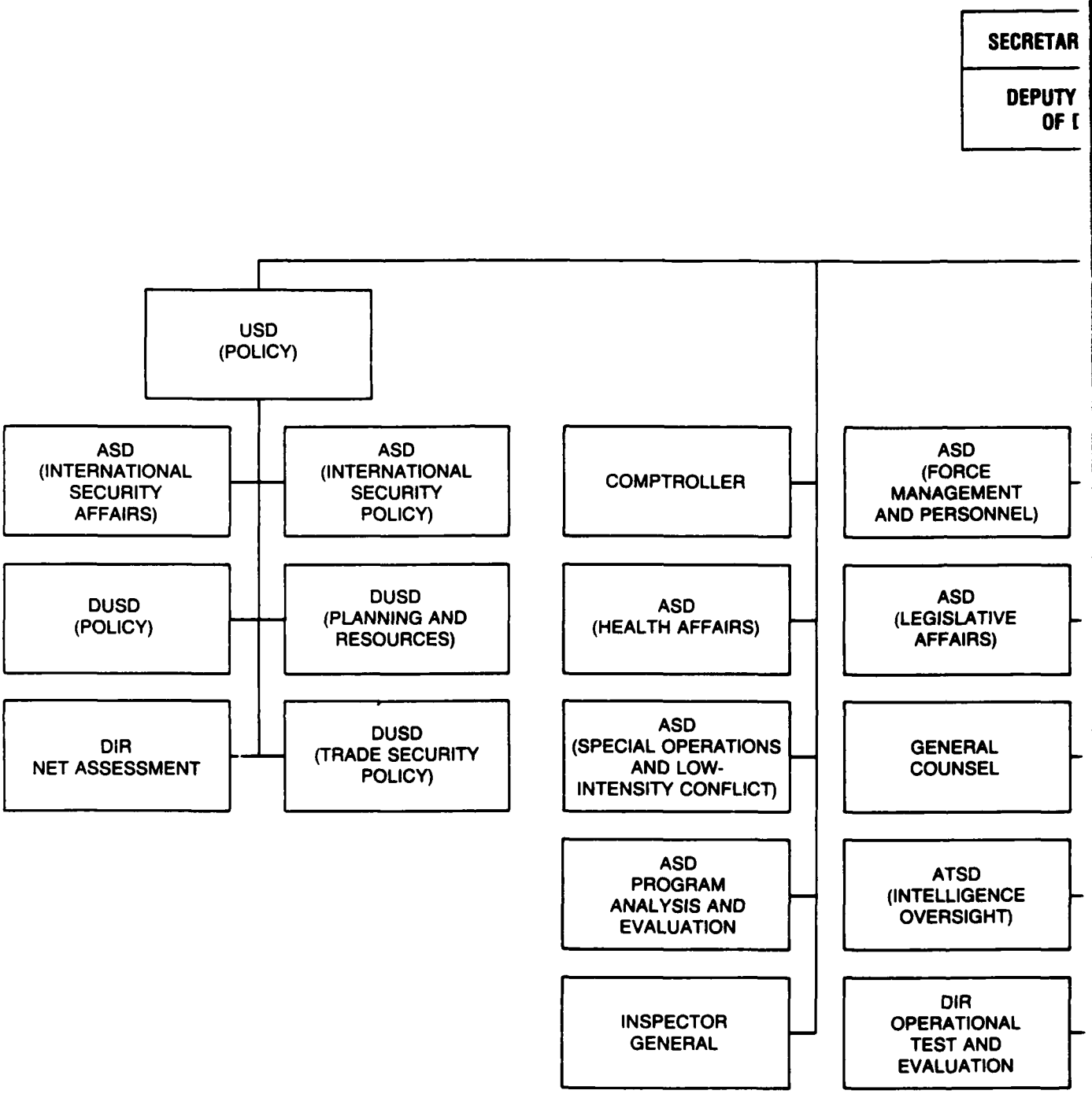
Ref.: DOD Directive 5141.2

E1.4 Comptroller of the Department of Defense. The Comptroller of the Department of Defense (DOD Comptroller) advises and assists the Secretary of Defense in the performance of the Secretary's programming, budgetary, and fiscal functions and organizational and administrative matters pertaining to these functions; provides for the design and installation of resource management systems throughout DOD; and collects, analyzes, and reports resource management information for the Secretary of Defense and, as required, for the Office of Management and Budget, the Congress, the General Accounting Office, and other agencies outside the DOD. The DOD Comptroller supervises, directs, and reviews the preparation and execution of the DOD budget and is responsible for policy matters pertaining to automatic data processing and central data services. The DOD Comptroller is a permanent member of the DAB.

Ref.: DOD Directive 5118.3

E1.5 Assistant Secretary of Defense, Program Analysis and Evaluation (ASD(PA&E)). The Assistant Secretary of Defense, Program Analysis and Evaluation has prime responsibility within DOD for systems analysis, including responsibility for analysis of weapon systems and major material items and support systems. The ASD(PA&E) develops policies and provides guidance upon which planning and program projections are based; performs analyses and evaluations of plans, programs, and budget submissions; identifies issues; and evaluates alternative programs. The ASD(PA&E) is a permanent member of the DAB.

Ref.: DOD Directive 5141.1


SECRETAR
DEPUTY
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ASD
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SECURITY
AFFAIRS)
ASD
(INTERNATIONAL
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COMPTROLLER
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(FORCE
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AND PERSONNEL)
DUSD
(POLICY)
DUSD
(PLANNING AND
RESOURCES)
ASD
(HEALTH AFFAIRS)
ASD
(LEGISLATIVE
AFFAIRS)
DIR
NET ASSESSMENT
DUSD
(TRADE SECURITY
POLICY)
ASD
(SPECIAL OPERATIONS
AND LOW-
INTENSITY CONFLICT)
GENERAL
COUNSEL
ASD
PROGRAM
ANALYSIS AND
EVALUATION
ATSD
(INTELLIGENCE
OVERSIGHT)
INSPECTOR
GENERAL
DIR
OPERATIONAL
TEST AND
EVALUATION

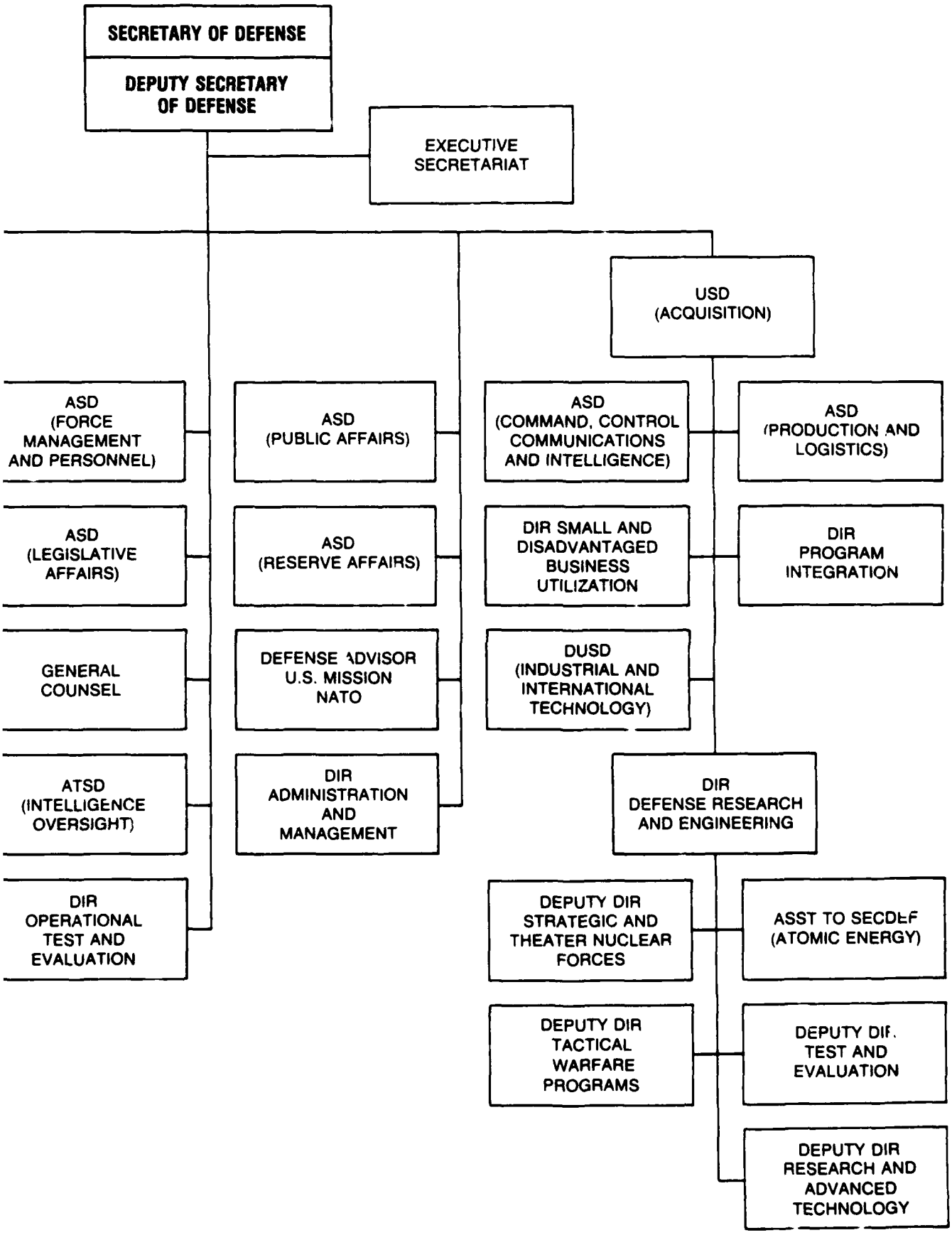

SECRETARY OF DEFENSE
DEPUTY SECRETARY OF DEFENSE
EXECUTIVE SECRETARIAT
USD (ACQUISITION)
ASD (FORCE MANAGEMENT AND PERSONNEL)
ASD (PUBLIC AFFAIRS)
ASD (COMMAND, CONTROL COMMUNICATIONS AND INTELLIGENCE)
ASD (PRODUCTION AND LOGISTICS)
ASD (LEGISLATIVE AFFAIRS)
ASD (RESERVE AFFAIRS)
DIR SMALL AND DISADVANTAGED BUSINESS UTILIZATION
DIR PROGRAM INTEGRATION
GENERAL COUNSEL
DEFENSE ADVISOR U.S. MISSION NATO
DUSD (INDUSTRIAL AND INTERNATIONAL TECHNOLOGY)
ATSD (INTELLIGENCE OVERSIGHT)
DIR ADMINISTRATION AND MANAGEMENT
DIR DEFENSE RESEARCH AND ENGINEERING
DIR OPERATIONAL TEST AND EVALUATION
DEPUTY DIR STRATEGIC AND THEATER NUCLEAR FORCES
ASST TO SECDEF (ATOMIC ENERGY)
DEPUTY DIR TACTICAL WARFARE PROGRAMS
DEPUTY DIR. TEST AND EVALUATION
DEPUTY DIR RESEARCH AND ADVANCED TECHNOLOGY

Exhibit E-1
Office of the Secretary
of Defense

E1.6 Defense Agencies

E1.6.1 Defense Nuclear Agency (DNA). DNA provides support for OSD, JCS, the Military Departments and other DOD Components, and other Federal Agencies on matters concerning nuclear weapons, nuclear weapons system acquisitions, nuclear weapons effects on weapon systems and forces, and other matters.

RDA-related DNA responsibilities include:

- Managing DOD nuclear weapons effects research and nuclear weapons effects test programs.
- Conducting research through Exploratory Development and/or proof of principle to develop technology and techniques to improve the security and survivability of nuclear weapon systems.
- Providing advice and assistance to DOD Components and Government Agencies.

Ref.: DOD Directive 5105.31

E1.6.2 Defense Communications Agency (DCA). The mission of the DCA is to (1) ensure that the Defense Communications System (DCS) will be so planned, engineered, established, improved, and operated as to effectively, efficiently, and economically meet the long-haul, point-to-point telecommunications requirements of the Department of Defense to provide communications (a) from the President to and from the Secretary of Defense, the Joint Chiefs of Staff, and other governmental agencies, (b) from the Secretary of Defense and Joint Chiefs of Staff to and between the military departments and the unified and specified commands, (c) from the military departments to and between their major commanders and subordinate fixed headquarters, and (d) from the unified and specified commands to and between their component and subordinate commands; (2) obtain the maximum economy and efficiency in the allocation and management of Department of Defense communications resources; (3) provide for systems engineering and technical supervision of technical support for the National Military Command System and of assigned related systems.

Ref.: DOD Directive 5105.19 (OPNAV 5410.12)

E1.6.3 Defense Contract Audit Agency (DCAA). The purpose of DCAA is to perform all necessary contract audit for the Department of Defense and to provide accounting and financial advisory services regarding contracts and subcontracts to all components of the Department of Defense who are responsible for procurement and contract administration. These services are provided in connection with the negotiation, administration, and settlement of contracts and subcontracts. The agency also provides contract audit service to other government agencies under appropriate arrangements.

DCAA consists of an agency headquarters office and six regional offices. The regional offices manage over 300 field audit offices located throughout the United States and overseas. These field audit offices are called branch, resident, and procurement liaison offices. The agency headquarters exercises worldwide direction and control of the agency. The regional offices and their respective field audit offices are responsible for carrying out the contract audit program within their respective regions.

Ref.: DOD Directive 5105.36

E1.6.4 Defense Intelligence Agency (DIA). The mission of the DIA is to satisfy, or to ensure the satisfaction of, the foreign intelligence requirements of the Secretary of Defense, the Joint Chiefs

of Staff, DOD components and other authorized recipients, and to provide the military intelligence contribution to national intelligence. In carrying out this mission, the Director, DIA, advises the Secretary of Defense on intelligence matters; participates in the DAB process by providing threat descriptions in support of systems acquisitions; acts as management authority for certain intelligence information systems; maintains a strong DOD scientific and technical intelligence program; and establishes, conducts or recommends RDA programs to carry out intelligence responsibilities. The Director, DIA, assigns tasks and issues instructions or guidance, through the Secretary of Defense, to DOD components as necessary to carry out functions assigned.

Ref.: DOD Directive 5105.21

E1.6.5 Defense Logistics Agency (DLA). The DLA mission is to function as an integral element of the DOD military logistics system to provide worldwide logistic support to the Military Departments, the Unified and Specified Commands, as well as other DOD Components and other customers.

Among DLA's many functions, it operates technical report data banks, oversees operation of contractor operated DOD Information Analysis Centers; and provides scientific and technical information to DOD components. (See Appendix D.)

Ref.: DOD Directive 5105.22

E1.6.6 National Security Agency (NSA). The National Security Agency has two primary missions—a security mission and an intelligence information mission. The responsibilities of the Director, National Security Agency include: (1) prescribing certain security principles, doctrines, and procedures for the U.S. Government; (2) organizing, operating, and managing certain activities and facilities for the production of intelligence information; (3) organizing and coordinating the research and engineering activities of the U.S. Government which are in support of the Agency's assigned functions; and (4) regulating certain communications in support of Agency missions.

Ref.: DOD Directive 5100.23

E1.6.7 Defense Mapping Agency (DMA). DMA provides support on matters of mapping, charting, and geodesy (MC&G) for the Military Departments, the Organization of the Joint Chiefs of Staff, the Unified and Specified Commands, and Defense Agencies.

RDA-related DMA services and functions include:

- Providing advice and assistance on MC&G matters.
- Ensuring responsible support to MC&G requirements.
- Establishing DOD MC&G RDT&E requirements.

Ref.: DOD Directive 5105.40

E2 OFFICE OF THE SECRETARY OF THE NAVY

Ref.: SECNAV Instructions 5000.1, 5430.7, 5430.67

E2.1 The Under Secretary of the Navy (USN). As the principal staff assistant and advisor to the Secretary of the Navy for acquisition matters, and as the Navy Acquisition Executive the USN shall:

- Exercise the power and discharge the responsibilities established by DOD Directive 5000.1, and Department of Defense policy for service acquisition executives.
- Exercise all delegable powers and responsibilities in the area of acquisition that are assigned to the Secretary of the Navy by law and regulation.
- Be designated under Title 10, United States Code, Section 5014(c), as the single office or entity responsible for acquisition within the Office of the Secretary of the Navy.
- Assure that the concepts, policies, and applicable instructions are compiled with and effectively administered throughout the Department of the Navy.
- Chair the DON POM Strategy Board (DPSB), as delegated, to ensure proper correlation between approved acquisition programs and the PPBS process. The DPSB shall advise the Secretary of the Navy on the POM and budget submissions to OSD and any adverse funding impact on approved acquisition programs.
- Approve selection of PMs for ACAT I programs and chair NPDM reviews for all ACAT I programs.

Ref.: SECNAV Instruction 5000.1

E2.2 Assistant Secretary of the Navy (Research, Engineering, and Systems) (ASN(R,E&S)).

Ref.: SECNAV Instruction 5430.95

E2.2.1 Duties and responsibilities. The Assistant Secretary of the Navy (Research, Engineering, and Systems) is responsible for all matters related to research, engineering, test, and evaluation efforts within the Department of the Navy, including management of the appropriation RDT&E,N; oceanography; ocean engineering and closely related matters; the technical aspects of production and maintenance or alteration of material; and Navy acquisition programs up to the point at which the decision is made to transition to fullscale production, including policy and administration of affairs related thereto with the exception of the acquisition of naval ships funded by the appropriation SCN.

E2.2.2 Relationships. In the performance of the above responsibilities the ASN(R,E&S) is responsible for liaison with the Under Secretary of Defense (Acquisition) and with Assistant Secretaries of Defense as appropriate. The ASN(R,E&S) consults with the Chief of Naval Operations and the Commandant of the Marine Corps on the planning, programming, status, and execution of RDT&E programs. The ASN(R,E&S) maintains active liaison with the Assistant Secretary of the Army for Research, Development, and Acquisition and the Assistant Secretary of the Air Force for Acquisition.

The ASN(R,E&S) is also responsible for supervision of the Office of Naval Research.

E2.2.3 Organization. There are three directorates within the Office of the ASN(R,E&S). These directorates are headed by the officials listed in the titles of the following subparagraphs.

E2.2.3.1 Principal Deputy Assistant Secretary of the Navy (PDASN). Composed predominantly of civilians, responsibilities of this directorate include oversight and direction of policy, business, and technical matters related to RDA programs under cognizance of ASN(R,E&S). In addition, this directorate brings to ASN(R,E&S), and other elements of the Secretariat, CNO, and CMC, those issues which may require alternative technical or business advocacy.

E2.2.3.2 Director, Research, Development, Test and Evaluation, (DRDT&E). Composed predominantly of uniformed Navy personnel, DRDT&E insures that research, Development and Acquisition programs support the military requirements of the Navy. Under his OPNAV title of Director, Research and Development Requirements, Test and Evaluation (DR&DR,T&E), he also serves as principal advisor to CNO in support of CNO's RDA responsibilities (see E3.12).

E2.2.3.3 Commanding General, Marine Corps Research, Development and Acquisition Command. Composed predominantly of uniformed Marine Corps Personnel, responsibilities include management of Marine Corps land warfare Research, Development and Acquisition programs under the cognizance of ASN(R,E&S). For the parallel duties of CG,MCRDAC, in the Marine Corps see E6.1. The CG,MCRDAC also serves as the Program Executive Officer (PEO) for the Marine Corps, and, when acting in this capacity, reports directly to the USN.

Ref.: SECNAV Instruction 5430.95

E2.3 Assistant Secretary of the Navy (Shipbuilding and Logistics) (ASN(S&L)). ASN(S&L) is responsible for:

- all aspects of design, development, production, and support for ships. Serve as or delegate PDA for ACAT II and III shipbuilding programs from Program Initiation through Milestone V.
- physical integration of shipboard components subsystems, and combat systems for all ships.
- business and contractual policy; fiscal management of the procurement, Military Construction (MILCON), and Operations and Maintenance Navy (O&MN) appropriations; and logistics and life cycle support of all acquisition programs.
- performing the function of Service Procurement Executive as defined in Title 41 United States Code 414, Executive Order 12352, and SECNAVINST 4200.29. ASN(S&L) will ensure programs that enter production are reliable and maintainable and can be produced and supported at affordable rates. ASN(S&L) will be responsible for management and support of all programs beginning at Milestone III or Milestone IIIB Full Rate Production (FRP).
- review all acquisition plans and strategies and any significant changes thereto as required by Part 7 of the Navy Acquisition Regulations Supplement (NARSUP). Jointly approve, with ASN (R,E&S), acquisition plans and strategies with RDT&E and procurement funding. Approve acquisition plans and strategies involving only procurement funding.
- monitor compliance with DOD Directive 5000.1, DOD Instruction 5000.2, and SECNAV Instruction 5000.1.
- ACAT III programs not involving shipbuilding: serve as or delegate PDA at Milestone IIIB (FRP) and subsequent milestone decision points, obtain ASN(R,E&S) concurrence on Milestone IIIB (FRP) decisions prior to PDA approval, and concur with Milestone IIIA Low Rate Initial Production (LRIP) decisions prior to ASN(R,E&S) PDA approval.

Ref.: SECNAV Instructions 5000.1, 5430.96

E2.4 Office of Program Appraisal (OPA). The Office of Program Appraisal provides the Secretary of the Navy with a small appraisal staff to assist in assuring that existing and proposed Navy

and Marine Corps programs provide the optimum means of achieving Department of the Navy objectives. The office conducts or coordinates studies, evaluates the responsiveness of the programming system to the needs of the Secretary, and provides recommendations as required.

Ref.: SECNAV Instruction 5430.60

E3 OFFICE OF THE CHIEF OF NAVAL OPERATIONS (OPNAV)

The Chief of Naval Operations (CNO) takes precedence over all other officers of the naval service in the performance of his duties within the Department of the Navy. CNO is the Navy member of the Joint Chiefs of Staff and the principal official of the Office of the Chief of Naval Operations (OPNAV) which is responsible, under law, to furnish professional advice and assistance to the Secretary, the Under Secretary, and the Assistant Secretaries of the Navy, and to the Chief of Naval Operations (see Exhibit E-2).

Subject to the authority, direction, and control of the Secretary of the Navy, the Chief of Naval Operations shall:

- preside over the Office of the Chief of Naval Operations;
- transmit the plans and recommendations of the Office of the Chief of Naval Operations to the Secretary and advise the Secretary with regard to such plans and recommendations;
- after approval of the plans or recommendations of the Office of the Chief of Naval Operations by the Secretary, act as the agent of the Secretary in carrying them into effect;
- exercise supervision, consistent with the authority assigned to commanders of unified or specified combatant commands, over such of the members and organizations of the Navy and the Marine Corps as the Secretary determines;
- perform the duties prescribed for him under Public Law 99-433 and other provisions of law; and
- perform such other military duties, not otherwise assigned by law, as are assigned to him by the President, the Secretary of Defense, or the Secretary of the Navy.

Ref.: OPNAV Instruction 5430.48, OPNAV Organization Manual

E3.1 Deputy Chief of Naval Operations (Manpower, Personnel, and Training)/Chief of Naval Personnel (DCNO (MPT)) (OP-01). The mission of the DCNO(MPT) is to implement the responsibilities of the CNO for the management of planning and programming of MPT resources, budgeting for military personnel, and appraisal of the Navy's total force manpower, personnel, and training (MPT) programs; to develop systems for requirements determination of total MPT resources and allocation of military personnel; to serve as principal advisor on MPT matters and exercise centralized coordination and control of professional standards criteria and human resource management.

In carrying out the above responsibilities the DCNO(MPT) exercises joint responsibility with other sponsors for ensuring validity and feasibility of requirements for new equipment and weapon systems. In addition, the DCNO(MPT) determines RDT&E military requirements and monitors efforts in support of total force MPT management. (Note: the term "total force" as used here encompasses active duty and reserve military, civilians, and contractors.)

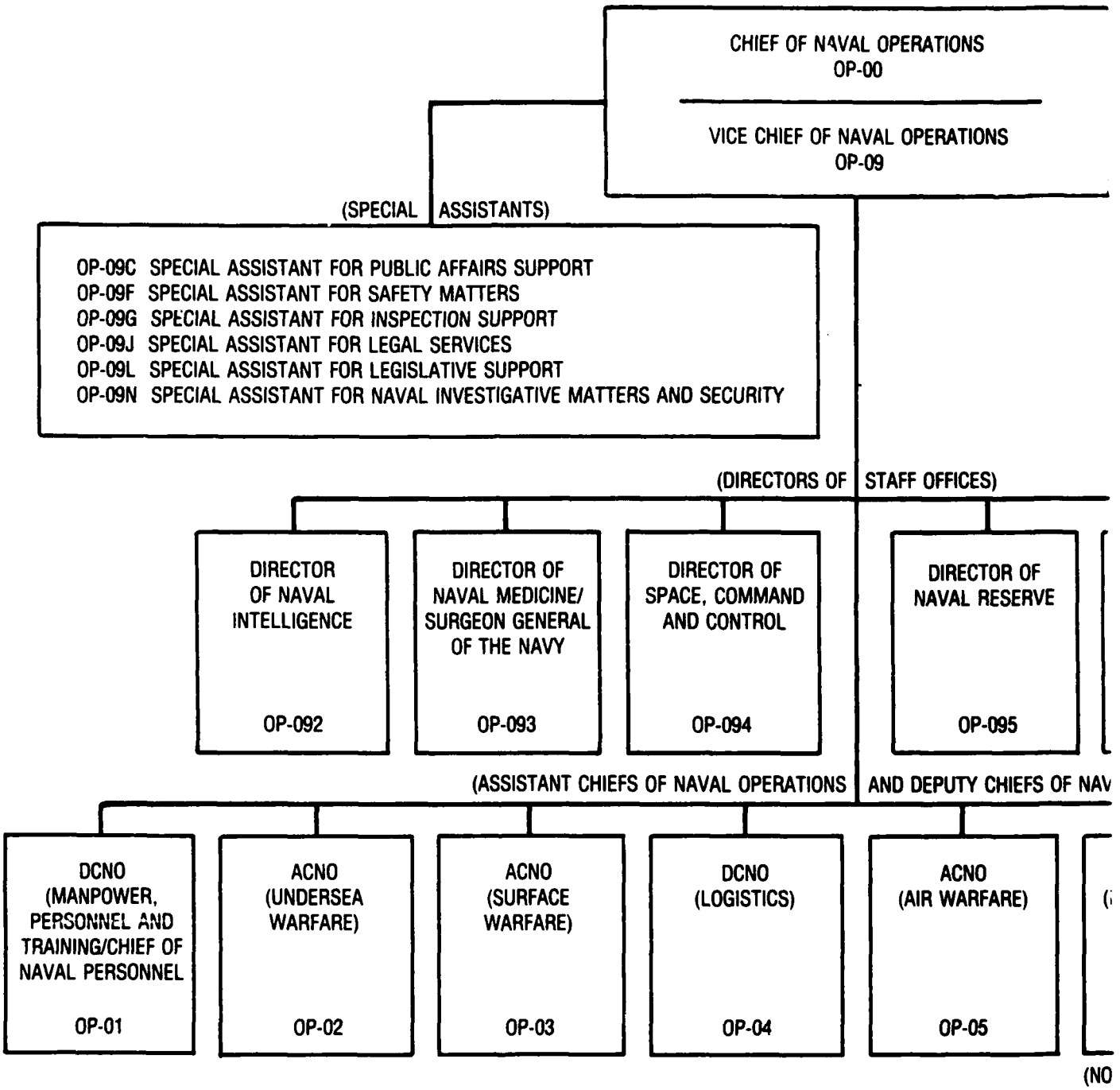
E3.2 Assistant Chief of Naval Operations (Undersea Warfare) (OP-02). The ACNO (Undersea Warfare) implements the responsibilities of the Chief of Naval Operations with respect to the determination of shipboard and related support requirements, and major characteristics of programs pertaining to submarines, deep submergence systems, and undersea surveillence matters, and in such planning, preparation, and execution as are incident thereto; acts as the CNO's principal advisor on submarine, deep submergence systems, and undersea surveillance matters; fulfills responsibilities in respect to readiness, training, and preparation for war; exercises centralized direction of all strategic submarine force planning, programming, and appraising in order to ensure integrated and effective Navy strategic submarine concepts and force levels; acts as representative in these matters involving relationships with other governmental agencies; and, in coordination with the DCNO (Naval Warfare) (OP-07), develops overall submarine force levels and requirements.

E3.3 Assistant Chief of Naval Operations (Surface Warfare) (OP-03). The ACNO (Surface Warfare) implements the responsibilities of the Chief of Naval Operations with respect to the determination of shipboard requirements and major characteristics of surface ships (less carriers and submarine support ships) and surface warfare programs, including those in the Naval Reserve; fulfills responsibilities with respect to operational readiness, training and preparation for war of surface ships (less carriers and submarine support ships); acts as principal advisor on surface warfare matters involving relationships with other governmental agencies; exercises for the CNO centralized formulation, coordination, supervision and execution of the Navy shipbuilding and conversion programs for all surface ships (less carriers and submarine support ships); directs programming and budgeting for all ship programs, including those of the Naval Reserve Force, and ensures that the programs are fully supported by timely planning and appraisal; formulates the characteristics of all naval surface ships (less carriers and submarine support ships) in order to fulfill and anticipate the requirements of naval operations; acts as Chairman of the Ship Characteristics and Improvement Board (SCIB); manages specific programs which the CNO may direct; and, in coordination with the DCNO (Naval Warfare) (OP-07), develops overall force levels and requirements related to surface warfare (less carriers and submarines).

E3.4 Deputy Chief of Naval Operations (Logistics) (OP-04). The mission of the DCNO (Logistics) is to plan, determine, and provide for the logistic support needs of the Operating Forces of the Navy, except for those areas elsewhere assigned; and to serve as the principal advisor and executive to the Chief of Naval Operations on the conduct of the logistics affairs of the Department of the Navy.

E3.5 Assistant Chief of Naval Operations (Air Warfare) (OP-05). The ACNO (Air Warfare) implements the responsibilities of the Chief of Naval Operations with respect to naval aviation programs, including the Naval Air Reserves; determines the shipboard and related support requirements for aircraft carriers and specified aviation type ships; acts as the principal advisor on naval aviation matters, including air warfare, and as the representative in naval air operational matters involving relationships with other government and civil agencies; and, in coordination with the DCNO, (Naval Warfare) (OP-07) develops overall naval aviation force levels and requirements.

E3.6 Deputy Chief of Naval Operations (Plans, Policy, and Operations) (OP-06). The DCNO (Plans, Policy and Operations) serves as the principal advisor and OPNAV staff executive to CNO for JCS matters and implements CNO responsibilities for the development and dissemination of strategic plans and policies; serves as principal advisor to SECNAV and CNO on strategic planning, nuclear weapons systems,



NOTE 1: DESIGNATED AS PRINCIPAL STAFF ASSISTANT FOR JCS MATTERS
NOTE 2: DESIGNATED AS PRINCIPAL STAFF ASSISTANT FOR OTHER THAN JCS MATTERS

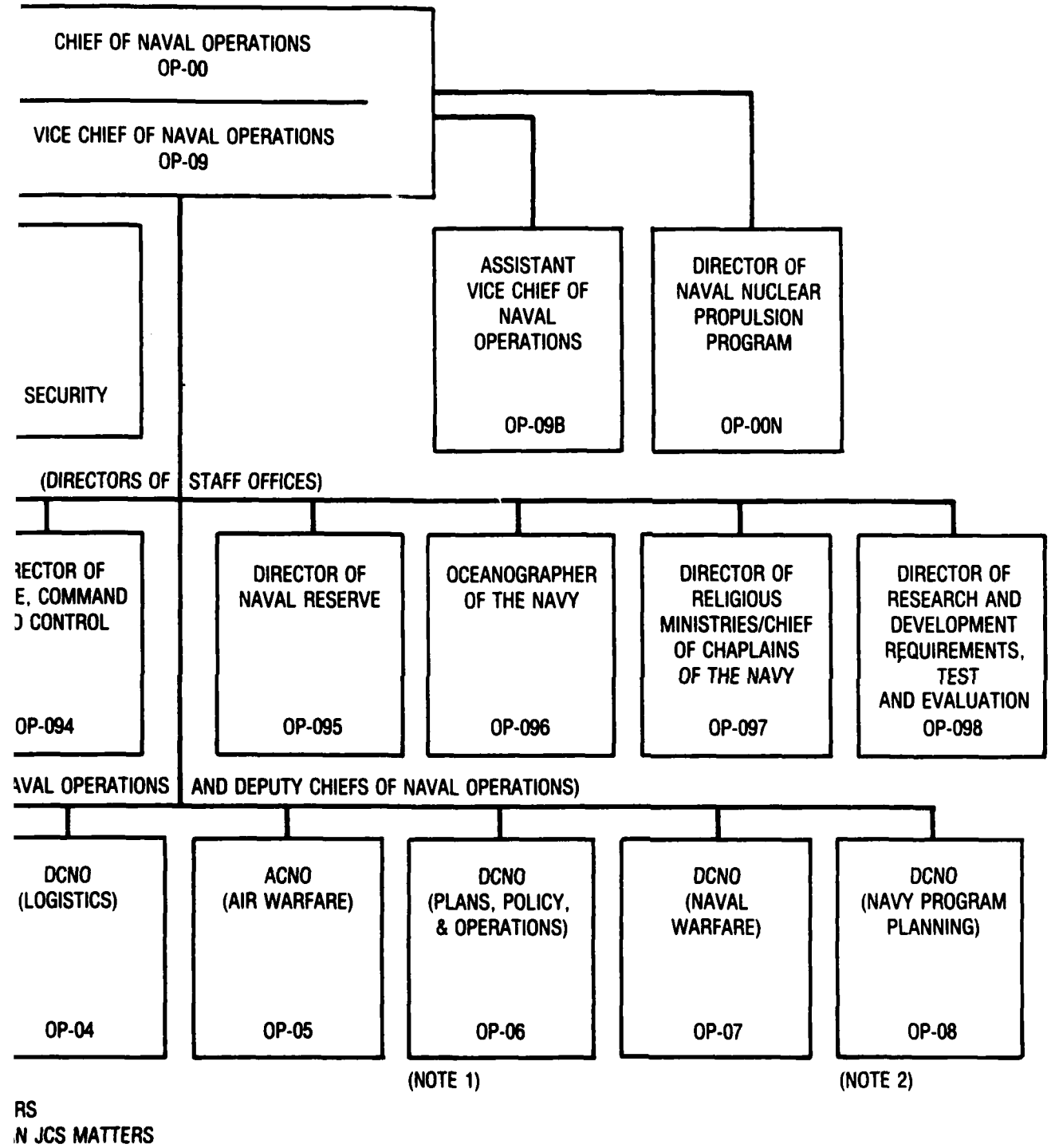

CHIEF OF NAVAL OPERATIONS
OP-00
VICE CHIEF OF NAVAL OPERATIONS
OP-09
ASSISTANT VICE CHIEF OF NAVAL OPERATIONS
OP-09B
DIRECTOR OF NAVAL NUCLEAR PROPULSION PROGRAM
OP-00N
SECURITY
(DIRECTORS OF STAFF OFFICES)
RECTOR OF
E, COMMAND
D CONTROL
OP-094
DIRECTOR OF NAVAL RESERVE
OP-095
OCEANOGRAPHER OF THE NAVY
OP-096
DIRECTOR OF RELIGIOUS MINISTRIES/CHIEF OF CHAPLAINS OF THE NAVY
OP-097
DIRECTOR OF RESEARCH AND DEVELOPMENT REQUIREMENTS, TEST AND EVALUATION
OP-098
AVAL OPERATIONS AND DEPUTY CHIEFS OF NAVAL OPERATIONS)
DCNO (LOGISTICS)
OP-04
ACNO (AIR WARFARE)
OP-05
DCNO (PLANS, POLICY, & OPERATIONS)
OP-06
DCNO (NAVAL WARFARE)
OP-07
DCNO (NAVY PROGRAM PLANNING)
OP-08
(NOTE 1)
(NOTE 2)
RS
N JCS MATTERS

Exhibit E-2
Office of the Chief of
Naval Operations (OPNAV)

National Security Council affairs, and international politico-military matters; serves as principal advisor to the CNO on technology transfer, security assistance, foreign disclosure, and international program policy issues; and maintains the current operational status of Navy forces.

DCNO (Plans, Policy, and Operations) plays a major role in the development of the structure of long-range Navy capability objectives which are realized through development of required technological capabilities.

E3.7 DCNO (Naval Warfare) (OP-07). The DCNO (Naval Warfare) exercises centralized coordination of planning and requirements for fleet readiness, modernization, and force levels associated with the conduct of tactical warfare by general purpose naval forces. Included are responsibilities for assessment, integration, and coordination of tactical warfare programs at the battle and amphibious force level for general tactical development and training and for special management of selected programs.

E3.8 DCNO (Navy Program Planning) (OP-08). The DCNO (Navy Program Planning) exercises centralized supervision and coordination of the Navy Program Planning and study effort, in order to ensure the integration of planning, programming, budgeting, and appraisal within the Office of the Chief of Naval Operations and the management echelons subordinate to the Chief of Naval Operations.

As the CNO's principal staff executive for other than JCS matters, the DCNO (Navy Program Planning) is responsible for reviewing and evaluating programs in relation to the total Navy program and for recommending to the CNO or VCNO changes where needed. In addition, OP-08 directs the budget process, including supervision of related financial management matters.

E3.8.1 General Planning and Programming Division (OP-80). Under the direction of the DCNO, (Navy Program Planning), OP-80 develops and operates the integrated program planning system for the Chief of Naval Operations and implements the responsibilities of the DCNO (Navy Program Planning) with regard to Navy programs and related plans.

E3.8.2 Program Resources Appraisal Division (OP-81). The mission of OP-81 is to evaluate the relative effectiveness of alternatives in programs and proposals and thereby assist in the decision-making process; to assess all major weapons and weapon systems at each milestone during the acquisition process; to manage the CNO Study and Analysis Program (CSTAP), to coordinate it with other Navy Department study efforts, and to review and evaluate study results; to implement OP-08 responsibilities for conducting scientific, analytical, and technical studies through the medium of CNA; to review and validate analytical models and methodologies used in program planning; and to support CNO with respect to the extended planning objectives of the Navy, including those pertaining to the future of seapower and other maritime-related matters involving the security and well-being of the United States.

E3.9 Director of Naval Medicine/Surgeon General of the Navy (OP-093). The Director Naval Medicine provides, within OPNAV, centralized and coordinated guidance, direction, and oversight on all health related programs.

E3.10 Director of Space, Command and Control (OP-094). The mission of OP-094 is to exercise centralized coordination over policy, planning, and integrating of requirements for Navy C^2, including C^2 and communications; space exploitation (except those requirements under the aegis of the Director, CIA), and space defense matters; reconnaissance; ocean surveillance (less Submarine Ocean Systems Underwater Surveillance (SOSUS)); C^3 and COMSEC; to implement the responsibilities of the CNO with respect to determination of characteristics, development, appraisal, and coordination of program execution for C^2 systems (including satellite communications, surveillance, navigation,

and environmental sensing systems); to act as principal advisor to the CNO on C^2 matters; to ensure optimum use of Navy information systems; to act as the CNO's representative to other services and government agencies for matters involving COMSEC, communications, information systems, space matters, Worldwide Military Command and Control System (WWMCCS), and Navy Electromagnetic Interference (EMI).

E3.11 Oceanographer of the Navy (OP-096). The mission of the Oceanographer of the Navy is to plan, coordinate, and implement the responsibilities of the CNO with regard to naval oceanography (including oceanography, meteorology, mapping, charting, goedesy, astrometry, and precise time and time interval); to assist the ASN(R,E&S) with respect to oceanography and related plans, programs, and policy matters, and to serve as the spokesman for naval oceanographic matters. OP-096 acts as resource sponsor for the Naval Oceanography Command and Naval Observatory and as program sponsor for Naval Oceanography programs. As Oceanographer of the Navy, OP-096 acts for SECNAV and CNO in interagency and international matters involving Naval Oceanography.

E3.12 Director of Research and Development Requirements, Test and Evaluation (DR&DR,T&E) (OP-098). The Director, R&DR,T&E implements CNO responsibilities to formulate and prioritize operational military requirements; conduct operational test and evaluation; and provide advice and support to SECNAV and offices within the Office of the Secretary of the Navy upon request regarding international research and development and armaments cooperation matters.

In carrying out these responsibilities in support of the CNO, Director, R&DR,T&E establishes policies and procedures which govern the Research and Development Requirements, Test and Evaluation processes, interfacing as necessary with the Navy Secretarial and OSD staffs and with the Systems Commands and R&D activities; in particular, provides the interface between the operational forces and OPNAV program sponsors with the RDA communities and assists the CNO in the execution and administration of related plans and programs; manages the OPNAV R&D process, including R&D requirements, program initiation, program definition and structure, testing and documentation, and transition at Milestones II and III; acts as CNO's military representative with other services and higher authorities regarding military RDT&E and warfighting requirements; coordinates FLTCINC inputs regarding military R&D requirements; and acts as OPNAV focal point for T&E matters.

In addition, Director, R&DR,T&E implements policy in the development of T&E plans, recommends changes based on T&E results, and serves as Navy focal point for resolving T&E issues with OSD; acts as Resource Sponsor for RDT&E facilities (laboratories, centers, ranges, etc.) as well as other selected programs as directed, and makes recommendations for improvement and modernization, security, MILCON, and manpower requirements.

Director, R&DR,T&E also serves as Senior National Representative in international cooperative RDT&E with allied navies concerning naval military requirements; and serves as the OPNAV Command Assist Official for COMOPTEVFOR.

Under the title of Director, RDT&E (see E2.1.3.2), Director, R&DR,T&E also provides support for RDT&E and acquisition management functions of SECNAV.

E3.13 Activities Reporting to CNO.

E3.13.1 Naval Systems Commands. (See E4.)

E3.13.2 Naval Medical Command. (See E8.)

E3.13.3 Naval Oceanography Command. Located at Bay St. Louis, Mississippi, the Naval Oceanography Command is responsible for the management of assigned oceanography; mapping, charting, and geodetic; and meteorological

activities and efforts under the Naval Oceanographic Program and provides technical guidance in such matters throughout the Department of the Navy.

Ref.: OPNAV Instruction 5450.165

E4 NAVAL SYSTEMS COMMANDS

E4.1 Material Support Responsibilities of Systems Commanders. Each Systems Command provides for and meets those material support needs of the Department of the Navy that are within the assigned "material support" responsibility of such command. This general responsibility includes specific responsibility for the research, design, development, logistics planning, test, technical evaluation, acquisition, procurement, contracting, production, construction, manufacture, inspection, fitting out, supply, maintenance, alteration, conversion, repair, overhaul, modification, advance base outfitting, safeguarding, distribution, and disposal of naval material for which the command is assigned responsibility. In addition, individual Systems Commands are tasked to perform control, coordination, or service functions as designated Lead Systems Commands for particular programs or functions.

Representative material support responsibilities are listed in the following sections.

E4.2 Naval Air Systems Command. (See Exhibit E-3.)

- Navy and Marine Corps aircraft systems and components (including fuels and lubricants)
- Air-launched weapon systems and components (excluding torpedoes and mines)
- Other airborne and airlaunched systems and components such as electronics, underwater sound, catapults, aircraft/missile range and evaluation instrumentation, mine countermeasures, targets, pyrotechnics, photographic and meteorological equipment, and training and support systems for the foregoing.

E4.3 Naval Facilities Engineering Command.

- Shore facilities and fixed surface and subsurface ocean structures
- Floating cranes, amphibious pontoon equipment, fleet moorings, and lift docks
- Materials and equipment for advanced base functional components
- Tools, equipment, and techniques for construction and maintenance of fixed surface and subsurface ocean structures
- Materials and appliances for defense ashore against chemical, biological, and radiological warfare.

E4.4 Naval Sea Systems Command. (See Exhibit E-4.)

- Ships, submersibles, other sea platforms, and craft
- Shipboard combat systems, including sensors, tactical data systems, surveillance and fire control radars, sonars, computers, guns, launchers, ammunition, guided missiles, mines, and torpedoes
- Shipborne components, including nuclear and non-nuclear propulsion, electrical generating equipment, auxiliary power generating and distribution systems, interior communications, navigation equipment, deck machinery, weapons and cargo handling, stowage, and damage control systems
- Diving and salvaging equipment
- Explosive ordnance disposal and explosive safety
- Ship systems integration.

E4.5 Naval Supply Systems Command.

- Serves as lead SYSCOM for logistics research and development
- Weapon system program support
- Materials-handling equipment not otherwise assigned
- Special clothing not otherwise assigned
- Automation of Navy technical data
- Naval material for which responsibility is not otherwise assigned.

E4.6 Space and Naval Warfare Systems Command. (See Exhibit E-5.)

- Command/control/communications (C^3) (platform to platform)
- Underseas and space surveillance (includes shore communications)
- Marine Corps expeditionary and amphibious electronics
- Multiplatform electronic systems not otherwise assigned
- Intelligence and intelligence-collection systems
- Space systems
- Cryptographic and cryptologic equipment.

In addition, SPAWAR has DON-wide responsibility for force warfighting architecture and requirements integration among the total naval battle force; to provide similar material support for the Marine Corps; and to provide management of DON R&D Centers.

E5 DEFENSE SYSTEMS MANAGEMENT COLLEGE (DSMC)

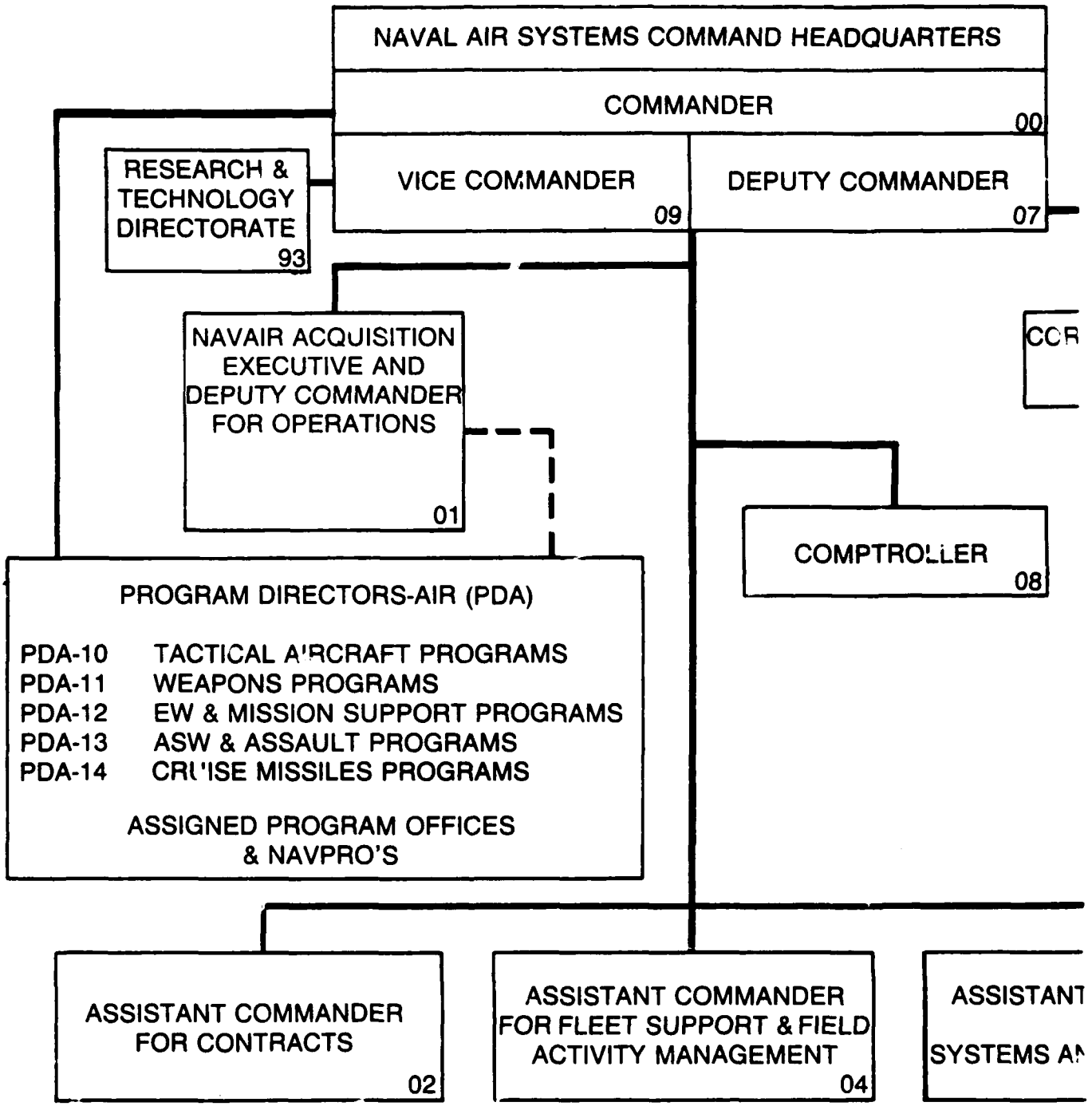
DSMC is a joint Military Service/Office of the Secretary of Defense professional military institution operating under the direction of a Policy Guidance Council chaired by the Under Secretary of Defense (Acquisition). The major course of study at DSMC serves as the capstone for the professional education of DOD Component personnel in program management and defense system acquisition management.

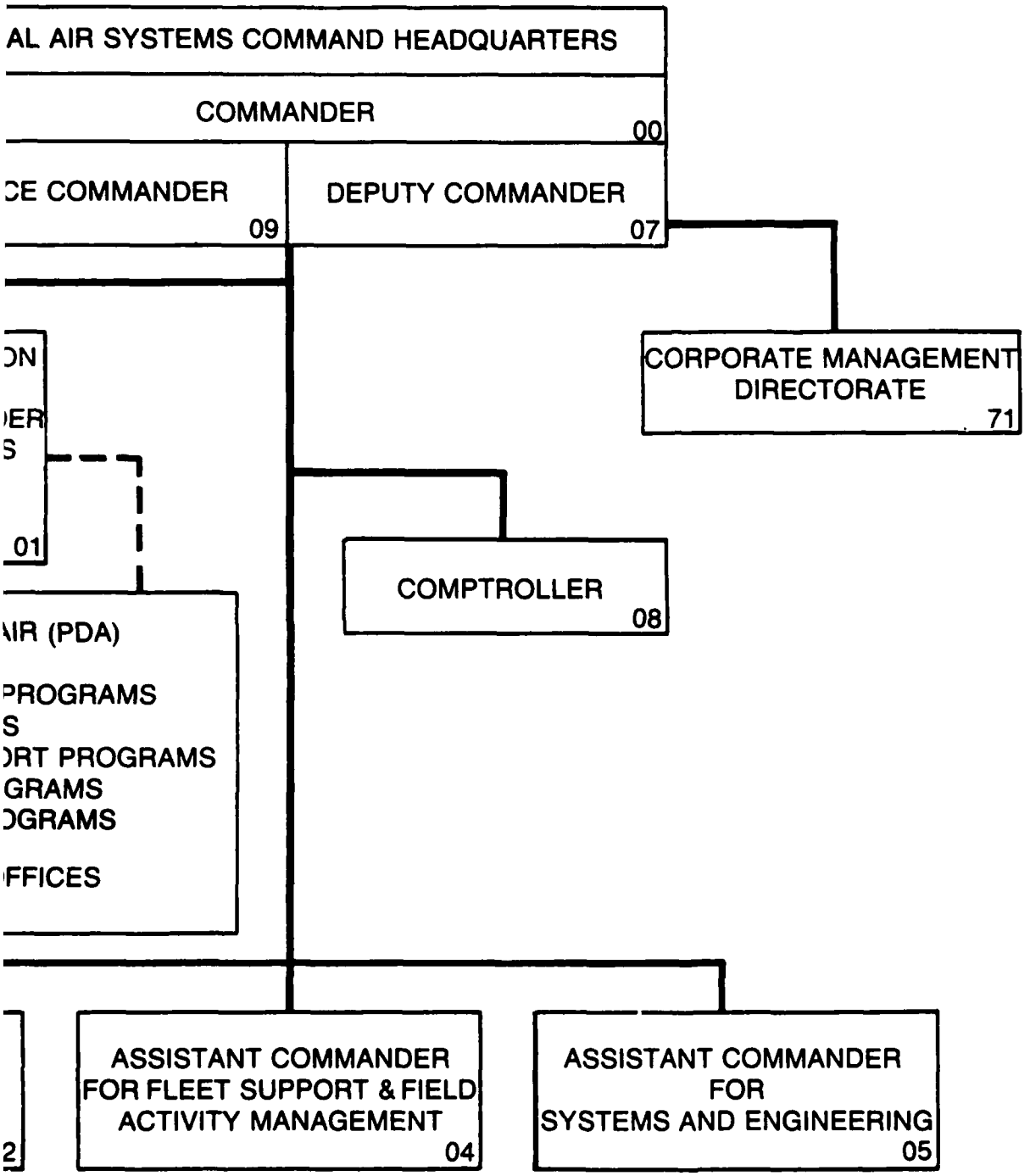
The mission of the DSMC is to: (1) conduct advanced courses of study that will prepare selected military officers and civilian personnel for assignments in program management career fields, and coping with various facets of defense system acquisition management; (2) conduct research or special studies in defense program management and defense system acquisition management concepts and methods; (3) assemble and disseminate information concerning new policies, methods, and practices in program management and defense system acquisition management.

The courses offered by the DSMC are intended to introduce the student to the world of systems acquisition and prepare him or her to function effectively within it. The content of each course and sub-course is continuously monitored and altered when necessary to reflect changing real-world conditions. Additionally, new short courses developed from time to time answer the needs of a specific management group, or respond to requests from various government agencies. To meet the need for regional courses, DSMC has established regional centers at Huntsville, Los Angeles, St. Louis, and Boston.

DSMC courses are conducted by a civilian and military faculty, whose efforts are complemented by guest lecturers from government, industry, and the academic communities. The College's non-attribution policy encourages guest lecturers to take part in open, candid discussions with students. This enhances the real-world flavor of the DSMC experience. For specified information about the courses and course schedules, call the Registrar at commercial (703) 664-4777 or AUTOVON 354-4777.

The DSMC has produced a series of guidebooks that cover various facets of the acquisition management business: program


NAVAL AIR SYSTEMS COMMAND HEADQUARTERS
COMMANDER
00
RESEARCH & TECHNOLOGY DIRECTORATE
93
VICE COMMANDER
09
DEPUTY COMMANDER
07
NAVAIR ACQUISITION EXECUTIVE AND DEPUTY COMMANDER FOR OPERATIONS
01
CCR
COMPTROLLER
08
PROGRAM DIRECTORS-AIR (PDA)
PDA-10 TACTICAL AIRCRAFT PROGRAMS
PDA-11 WEAPONS PROGRAMS
PDA-12 EW & MISSION SUPPORT PROGRAMS
PDA-13 ASW & ASSAULT PROGRAMS
PDA-14 CRUISE MISSILES PROGRAMS
ASSIGNED PROGRAM OFFICES & NAVPRO'S
ASSISTANT COMMANDER FOR CONTRACTS
02
ASSISTANT COMMANDER FOR FLEET SUPPORT & FIELD ACTIVITY MANAGEMENT
04
ASSISTANT
SYSTEMS A


AL AIR SYSTEMS COMMAND HEADQUARTERS
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CE COMMANDER
09
DEPUTY COMMANDER
07
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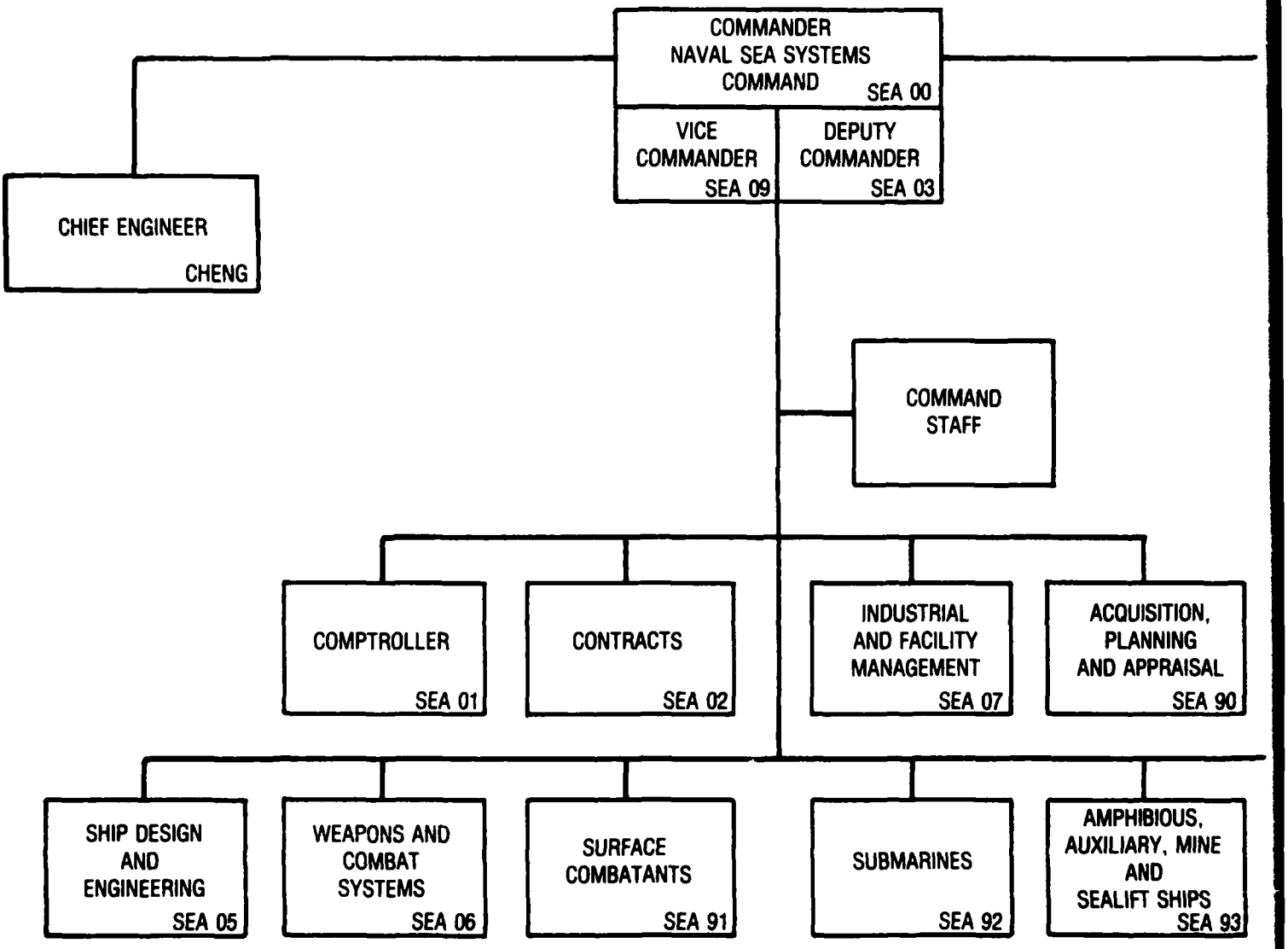
Exhibit E-3
Naval Air Systems
Command Headquarters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AND APPRAISAL
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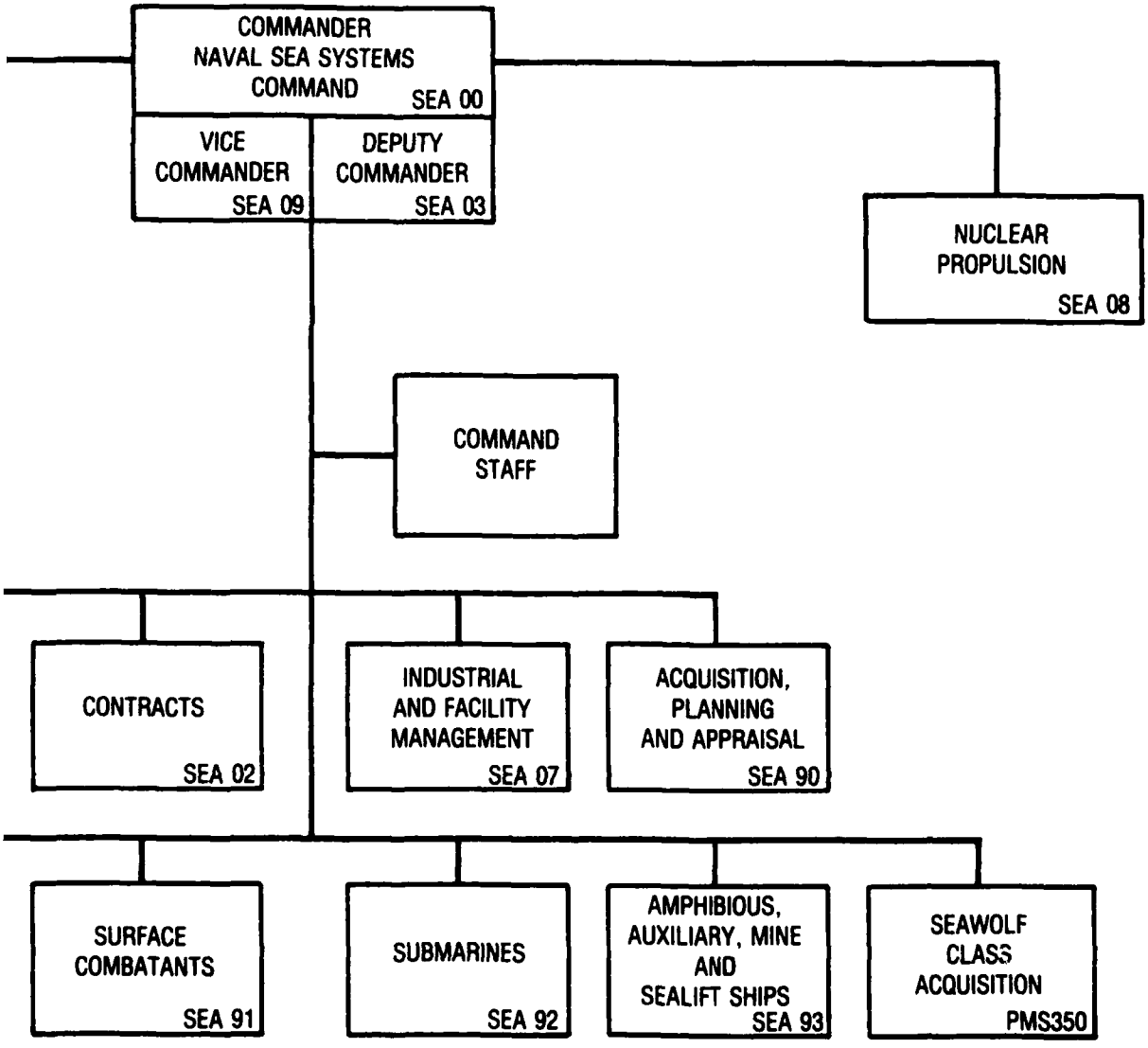
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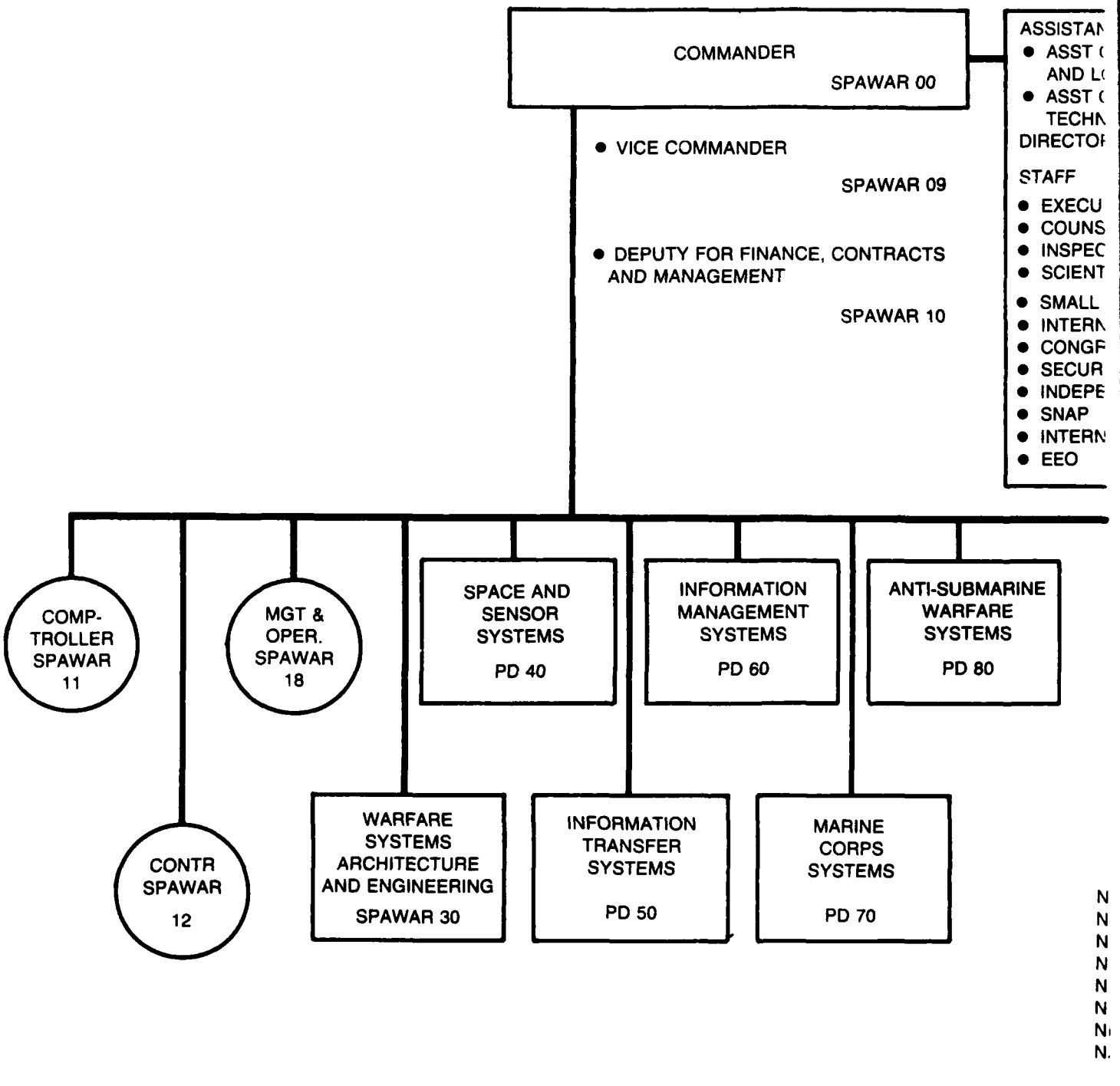
Exhibit E-4
Naval Sea Systems
Command Headquarters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• DEPUTY FOR FINANCE, CONTRACTS AND MANAGEMENT
SPAWAR 10
COMP-TROLLER SPAWAR 11
MGT & OPER. SPAWAR 18
SPACE AND SENSOR SYSTEMS
PD 40
INFORMATION MANAGEMENT SYSTEMS
PD 60
ANTI-SUBMARINE WARFARE SYSTEMS
PD 80
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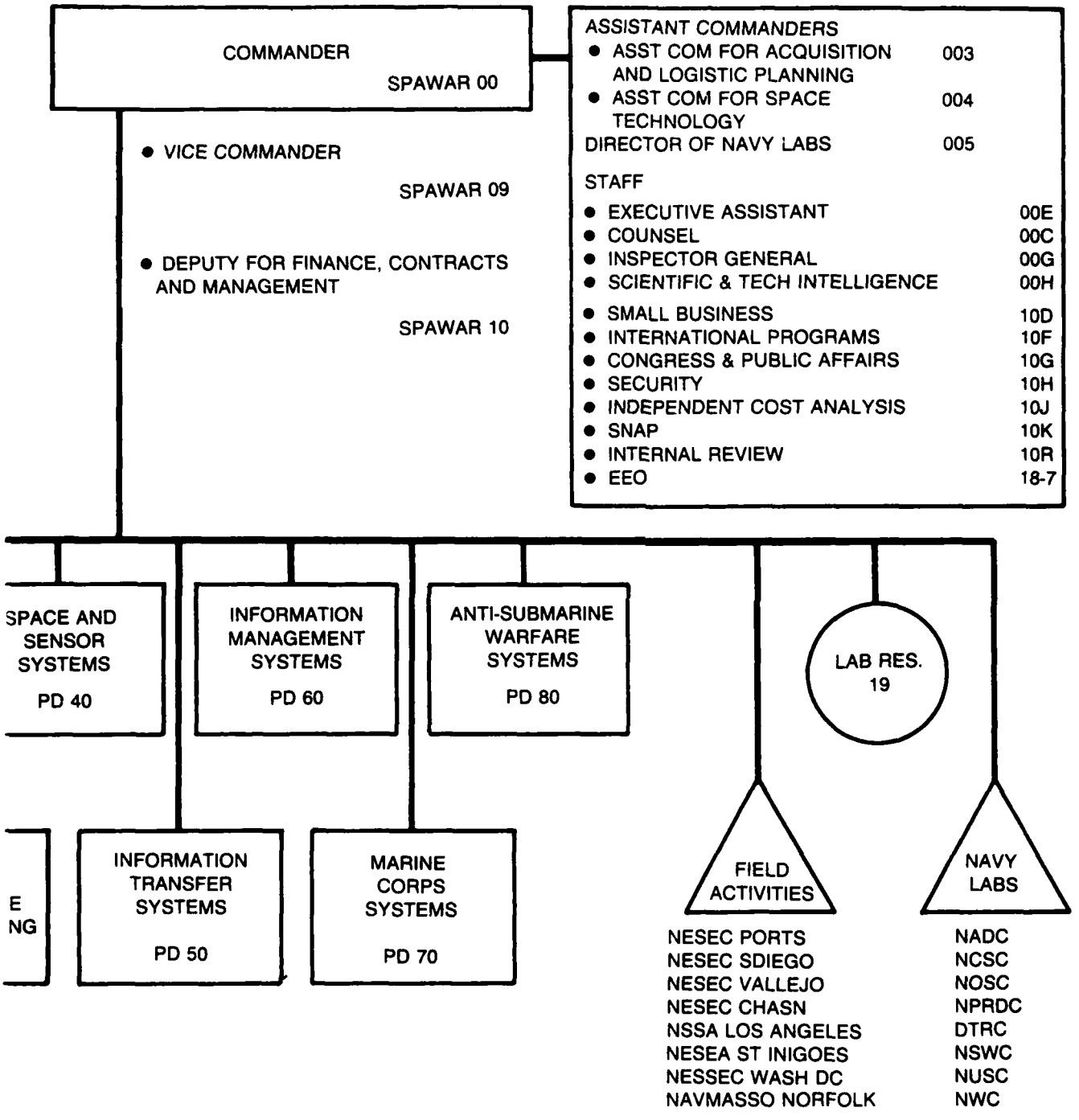
WARFARE SYSTEMS ARCHITECTURE AND ENGINEERING
SPAWAR 30
INFORMATION TRANSFER SYSTEMS
PD 50
MARINE CORPS SYSTEMS
PD 70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• ASST COM FOR SPACE TECHNOLOGY 004
DIRECTOR OF NAVY LABS 005
STAFF
• EXECUTIVE ASSISTANT 00E
• COUNSEL 00C
• INSPECTOR GENERAL 00G
• SCIENTIFIC & TECH INTELLIGENCE 00H
• SMALL BUSINESS 10D
• INTERNATIONAL PROGRAMS 10F
• CONGRESS & PUBLIC AFFAIRS 10G
• SECURITY 10H
• INDEPENDENT COST ANALYSIS 10J
• SNAP 10K
• INTERNAL REVIEW 10R
• EEO 18-7
• VICE COMMANDER
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PD 50
MARINE CORPS SYSTEMS
PD 70
FIELD ACTIVITIES
NESEC PORTS
NESEC SDIEGO
NESEC VALLEJO
NESEC CHASN
NSSA LOS ANGELES
NESEA ST INIGOES
NESSEC WASH DC
NAVMASSO NORFOLK
NAVY LABS
NADC
NCSC
NOSC
NPRDC
DTRC
NSWC
NUSC
NWC

Exhibit E-5
Space and Naval
Warfare Systems
Command Headquarters

management, technical management, business and financial management, and special topics. These guidebooks are available for use throughout the acquisition community. For specific information about the guidebooks, call the Director of Publications at commercial (703) 664-5082 or AUTOVON 354- 5082.

Ref.: DOD Directive 5160.55

E6 MARINE CORPS ORGANIZATION FOR RDA

The Marine Corps is responsible for the development of equipment intended for use by landing forces in amphibious operations. The two Marine Corps organizations primarily concerned with acquisition matters are the Marine Corps Research, Development and Acquisition Command (MCRDAC), located at Quantico and in the Washington, D.C., area, and the Marine Corps Combat Development Command (MCCDC) at Quantico, Virginia. Elements of the Marine Corps Headquarters organization support RDA activities. In addition, individual personnel assigned to other DOD activities as Marine Corps Liaison Officers or Marine Corps Representatives and those occupying Marine Corps-sponsored billets in such activities are considered to be elements of the Marine Corps acquisition establishment.

Ref.: MCO P5000.10

E6.1 Commanding General, Marine Corps Research, Development, and Acquisition Command. The Commanding General, Marine Corps Research, Development and Acquisition Command (CG,MCRDAC) is tasked to conduct, supervise and/or monitor all Marine Corps related research, development and acquisition functions. He plans and manages Marine Corps acquisition programs through all stages, from basic research through procurement and initial operational capability.

The CG,MCRDAC, serves as the Program Executive Officer (PEO) for the Marine Corps and is a principal of the Marine Corps Program Decision Meeting (MCPDM) (see E9.7) serving as a member of ACAT IC and II MCPDMs. He is chairman for ACAT III MCPDMs through milestone IIIA and Decision Authority for ACAT IV MCPDMs. Within the Marine Corps, he has overall responsibility for the review, coordination, and monitoring of all RDT&E and procurement activity.

Other functions include ensuring oversight and conduct of developmental test and evaluation of Marine Corps systems; developing and promulgating Marine Corps acquisition policy; implementing DOD, DON, and USMC financial management policy in support of acquisition programs; and acting as appropriation sponsor for RDT&E,N and PMC.

The CG,MCRDAC, also functions as Director of a staff element under ASN(R,E&S) providing management and oversight for Marine Corps acquisition matters under ASN(R,E&S) cognizance and functioning as principal advisor to ASN(R,E&S) on Marine Corps matters.

E6.2 Commanding General, Marine Corps Combat Development Command.

The Commanding General, Marine Corps Combat Development Command (CG,MCCDC) has been designated the field representative of the Commandant for development, in coordination with the other services, of those phases of amphibious operations that pertain to the doctrines, tactics and techniques used by landing forces. He serves as the Warfighting Proponent for the Commanding Generals, FMFLANT and FMFPAC, and in this capacity is responsible for developing operational requirements.

Representative functions performed by CG,MCCDC include: identifying required study areas and executing approved studies in support of

Marine Corps mid- and long-range planning; developing, assessing and promulgating concepts, plans and doctrine; acting as the Marine Corps focal point for war gaming; developing and implementing policy and programs for Marine Corps training and education; and preparing, coordinating and reviewing operational requirements documentation.

E6.3 HQMC Organization for RDA.

E6.3.1 Deputy Chief of Staff for Aviation. The Deputy Chief of Staff for Aviation (DC/S Avn) is a principal member of the MCPDM. The DC/S Avn holds the position of Assistant Deputy Chief of Naval Operations (Marine Aviation), which enables him to function as an OPNAV sponsor for Navy programs involving Marine aviation.

E6.3.2 Deputy Chief of Staff for Manpower. The Deputy Chief of Staff for Manpower (DC/S Mpr) is responsible for military (Marine and Navy) and civilian manpower required to support the Marine Corps. The DC/S Mpr directs and supervises all aspects of manpower matters, including personnel research, manpower analysis and the development of manpower information systems. He is a MCPDM principal.

E6.3.3 Deputy Chief of Staff for Installation and Logistics. The Deputy Chief of Staff for Installation and Logistics (DC/S I&L) exercises primary cognizance over all matters pertaining to installations and logistics support. The DC/S I&L is a principal member of the MCPDM.

E6.3.4 Deputy Chief of Staff for Requirements and Programs. The Deputy Chief of Staff for Requirements and Programs (DC/S R&P) is responsible for coordinating Headquarters Marine Corps actions within the framework of the PPBS to provide the overall program requirements of the Fleet Marine Force, the Supporting Establishment, and the Organized Marine Corps Reserve. The DC/S R&P ensures consistency, continuity, and compatibility of all approved requirements within available resources, and ensures HQMC staff application of appropriate analytical disciplines in requirements validation, program development, and program review. The DC/S R&P is a principal member of the MCPDM.

E6.3.5 Director, Command and Control, Communications, and Computers. The Director, Command and Control, Communications, and Computers Division (DirC^4). DirC^4 provides for planning, directing and coordinating staff activities relating to Marine Corps command and control, telecommunications and automated data systems and advises the CMC on JCS matters related to those activities. The DirC^4 is a principal member of the MCPDM.

E6.3.6 Director, Marine Corps Operational Test and Evaluation Activity. The Marine Corps Operational Test and Evaluation Activity (MCOTEA) is a separate and independent operational testing activity. The Director, MCOTEA reports to the Commandant and supports the systems acquisition process by conducting operational tests and evaluations. The Director, MCOTEA is a principal member of the MCPDM.

E6.4 Marine Corps RDT&E Liaison Organization. RDT&E liaison functions for the Marine Corps are performed by a far-reaching network of Marines who are assigned to duty at or within the R&D organizations of DOD and the other Services; to joint-Service project/program offices; to industrial contractor's activities; and to FMF units in the field. Some of these personnel are clearly identified as Marine Corps Representatives/Liaison Officers/Project Officers, but many others occupy billets within the structure of the command to which they are assigned and are identified only by an appropriate billet title.

E6.5 Fleet Marine Forces (FMF). The Fleet Marine Forces figure prominently in the Marine Corps organization for RDA by articulating operational requirements in coordination with CG,

MCCDC, and providing a tailored vehicle for troop test and evaluation of material development in an operational environment.

E7 OFFICE OF THE CHIEF OF NAVAL RESEARCH (OCNR)

Ref.: SECNAV Instructions 5430.20, 5430.67; OCNR Instruction 5430.1, OCNR Organizational Manual

The mission of the Office of the Chief of Naval Research (OCNR) is to plan, foster, and encourage scientific research in recognition of its paramount role in the preservation of national security, and to provide for both research and exploratory development needs of DON, including program planning and execution of research and of Exploratory Development programs; to provide technical advice to the CNO and the Secretary of the Navy in areas of Research and Exploratory Development; and to perform such other functions and tasks as may be directed.

The Chief of Naval Research (CNR) heads the OCNR, and is a principal advisor to ASN(R,E&S). The CNR is appointed by the President by and with the advice and consent of the Senate. The CNR is responsible to SECNAV through ASN(R,E&S).

To preserve the intent of the law which established ONR and achieve optimum integration of resources for basic research and exploratory development, all headquarters management functions have been incorporated into one organization, the OCNR. The OCNR consists of two lead offices: The ONR and the Office of Naval Technology (ONT). The lead offices are each headed by a civilian director: the Director, Office of Naval Research and the Director, Office of Naval Technology. The organization of OCNR is depicted in Exhibit E-6. The functions of OCNR:

- Provide leadership, management, and direction to the DON research and exploratory development programs and other RDT&E programs assigned to and conducted by OCNR
- Develop and formulate viable and responsive naval research and technology requirements based on current and projected Navy and Marine Corps long-range objectives and considerations of national security as expressed in such documents as Science and Technology Objectives, Warfare Plans, the CNO Program Analysis Memorandum process, etc., and provide a naval interface for joint service and joint agency scientific studies
- Conduct active liaison with the CNO and Navy and Marine Corps Headquarters and developmental activities to explore their areas of interest, ensure OCNR responsiveness to operational needs, and acquaint operational and developmental personnel with the significance of new research and technological results
- Coordinate naval research and promote cooperative research efforts within the Department of the Navy, with other elements of the Department of Defense, National Science Foundation, National Aeronautics and Space Administration, Department of Energy, and other government research groups
- Encourage, stimulate and maintain a vigorous Research Reserve Program to provide for mobilization and contingency response, performed in consonance with the OCNR mission, and interact with the active Navy in the solution of current problems
- Serve as the executive agent for the ASN(R,E&S) in the support and administration of the Naval Research Advisory Committee

- Provide, through the Office of the Chief of Naval Research, overall policy and direction to the patent program of the Navy
- Provide budgeting, accounting, and related reporting and data processing services for the ASN(R,E&S) required for management and control of the RDT&E,N Appropriation and for the CNO and the Commandant of the Marine Corps to fulfill their responsibilities in the planning, programming, and budgeting of the RDT&E Program
- Act as the DON focal point for worldwide research information.

E7.1 Office of Naval Research (ONR). ONR was established by public law in 1946 to plan, foster and encourage scientific research in recognition of its paramount importance as related to maintenance of future naval power and preservation of national security. The functions of ONR:

- Conduct research in augmentation of and in conjunction with the research and development conducted by other DON activities
- Coordinate the Naval Research Program
- Conduct a contract management program with educational institutions in support of all Federal agencies
- Administer the Navy's corporate research laboratories (NRL (Naval Research Laboratory), NORDA (Naval Ocean Research and Development Activity), NEPRF (Naval Environmental Prediction Research Facility), and INO (Institute for Naval Oceanography)).

E7.2 Office of Naval Technology (ONT). ONT was established in October 1980 to implement the management process for the planning and execution of the DON Exploratory Development Program. The functions of ONT:

- Manage the DON Exploratory Development (6.2) Program, assessing, planning, programming, budgeting, directing, and monitoring the 6.2 program
- Manage the DON's oversight activities in regard to the industrial Independent Research and Development Program.

OCNRINST 3910.3

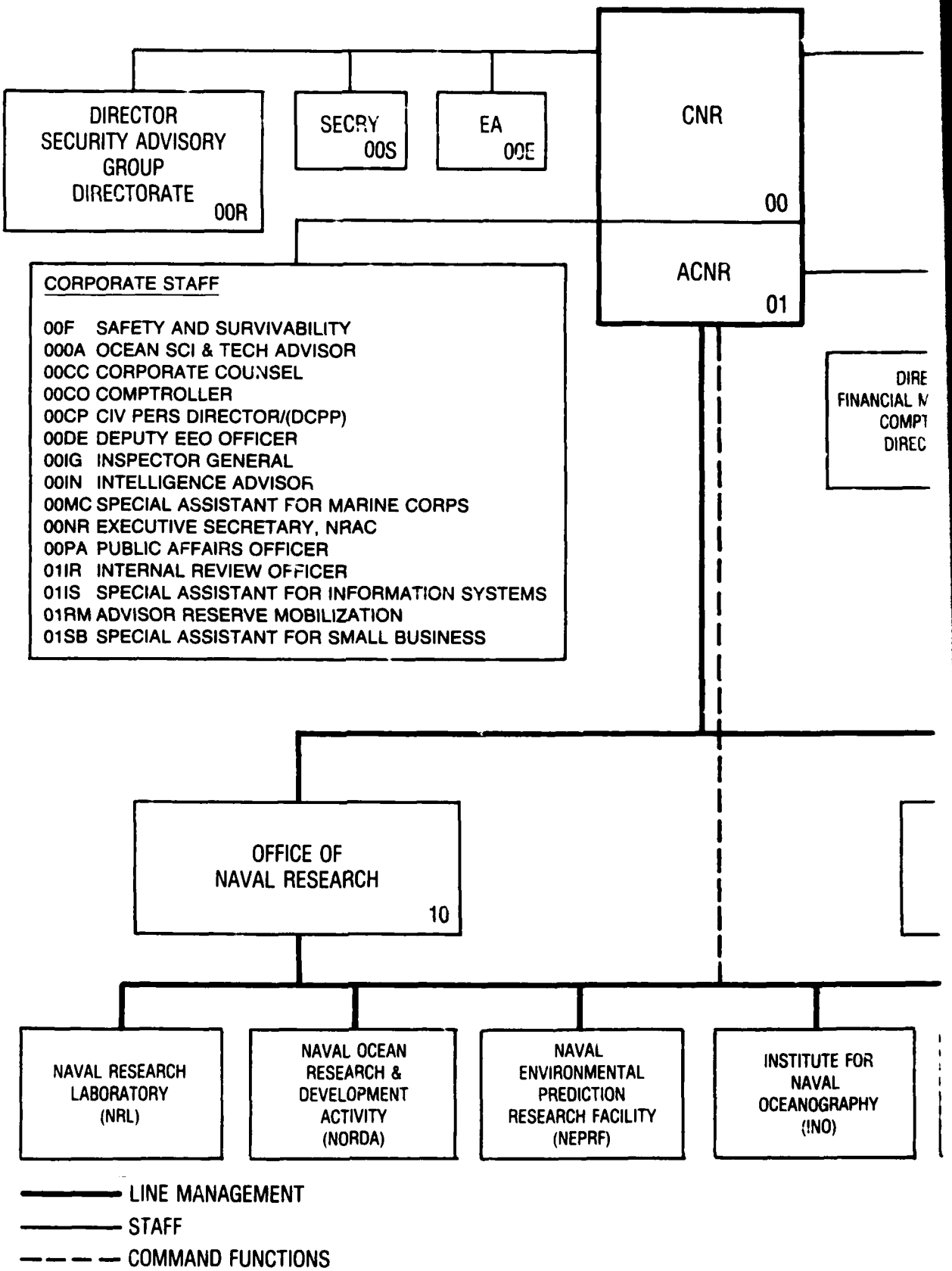
E8 NAVAL MEDICAL COMMAND (NAVMEDCOM)

R&D affairs within NAVMEDCOM are the responsibility of the Deputy Commander for Readiness and Support (MEDCOM-02), as assisted by the Assistant for Research and Development (MEDCOM-02D). Navy medical R&D is carried out under the direction of the Commanding Officer, Naval Medical Research and Development Command, Bethesda, Maryland.

NAVMEDCOMINSTS 5430.1, 5450.14

E8.1 Commanding Officer, Naval Medical Research and Development Command. The Commanding Officer, Naval Medical Research and Development Command manages and coordinates the Navy Medical Department Research, Development, Test, and Evaluation Program concerning the health, safety, and performance effectiveness of Navy and Marine Corps personnel.

In carrying out the above mission, the Commanding Officer, Naval Medical Research and Development Command commands the Navy Medical Department R&D laboratories; directs, plans, programs, budgets, and documents Navy Medical Department RDT&E efforts in response to Navy and Marine Corps RDT&E requirements;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CORPORATE STAFF
00F SAFETY AND SURVIVABILITY
000A OCEAN SCI & TECH ADVISOR
00CC CORPORATE COUNSEL
00CO COMPTROLLER
00CP CIV PERS DIRECTOR/(DCPP)
00DE DEPUTY EEO OFFICER
00IG INSPECTOR GENERAL
00IN INTELLIGENCE ADVISOR
00MC SPECIAL ASSISTANT FOR MARINE CORPS
00NR EXECUTIVE SECRETARY, NRAC
00PA PUBLIC AFFAIRS OFFICER
01IR INTERNAL REVIEW OFFICER
01IS SPECIAL ASSISTANT FOR INFORMATION SYSTEMS
01RM ADVISOR RESERVE MOBILIZATION
01SB SPECIAL ASSISTANT FOR SMALL BUSINESS
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NAVAL OCEAN
RESEARCH &
DEVELOPMENT
ACTIVITY
(NORDA)
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INSTITUTE FOR
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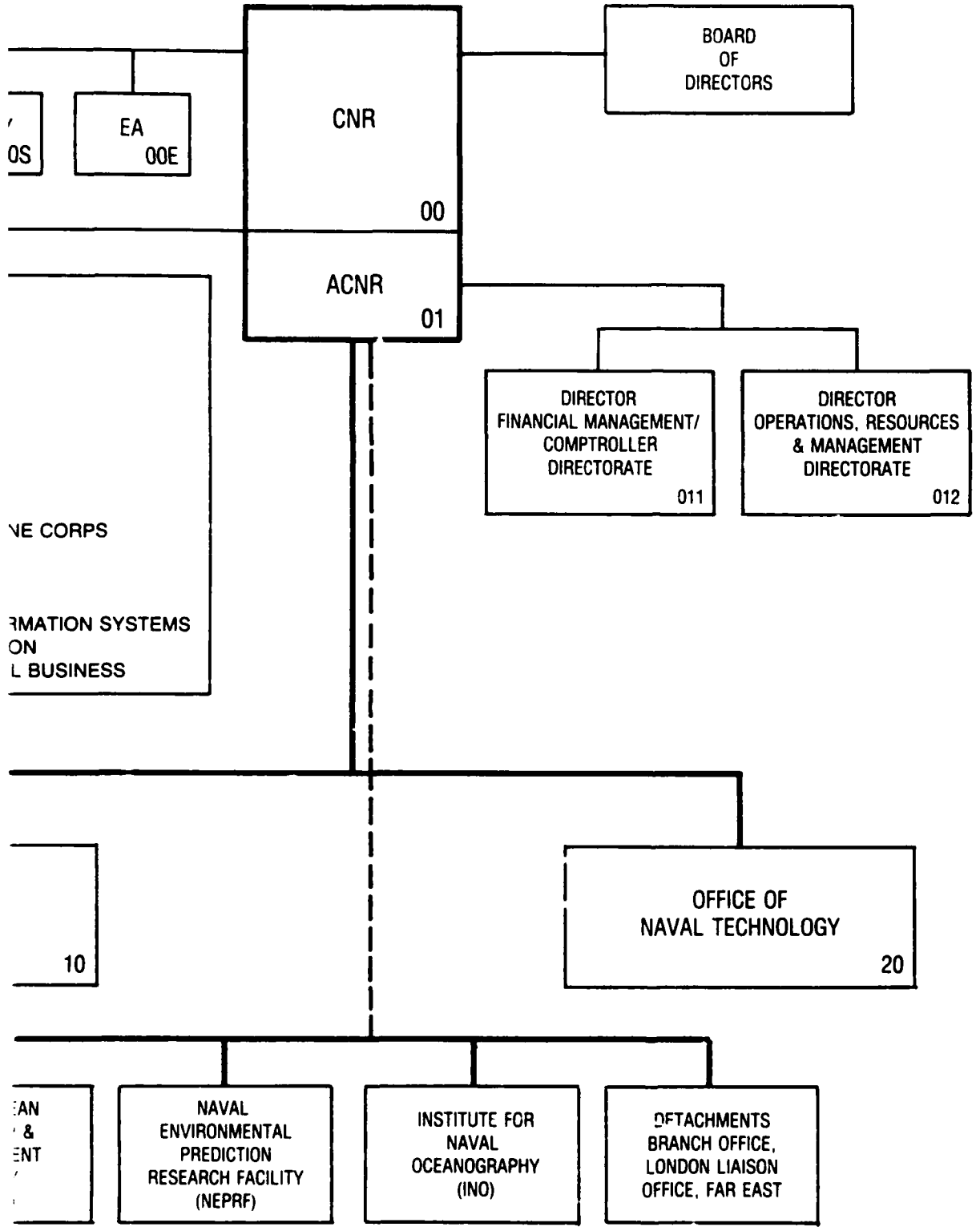
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OFFICE, FAR EAST

Exhibit E-6
Office of the Chief of Naval Research (OCNR)

determines requirements for and recommends procurement, training, assignment and distribution of R&D personnel; performs RDT&E staff functions for the Commander NAVMEDCOM; provides professional medical and dental guidance in the planning and conduct of Navy and Marine Corps weapon systems, life support systems, and personnel protection; and coordinates Navy medical research efforts with the Navy Commands and Offices, other government agencies, civilian organizations, and foreign governments.

E9 BOARDS AND OTHER GROUPS

E9.1 Defense Science Board (DSB). The Defense Science Board, composed of members appointed from civilian life by the Secretary of Defense upon the recommendation of the Under Secretary of Defense for Acquisition, advises the Secretary of Defense, through the Under Secretary for Acquisition, on scientific and technical matters of interest to the Department of Defense.

Ref.: DOD Directive 5129.22

E9.2 Defense Acquisition Board (DAB). The DAB is the primary forum used by DON and other DOD Components to resolve issues, provide and obtain guidance, and make recommendations to the Defense Acquisition Executive (DAE) on matters pertaining to the DOD Acquisition System in support of the oversight responsibilities and functions of USD(A) as DAE. The DAB replaced the JRMB which replaced the DSARC. Functions of the DAB include:

- Making recommendations to the DAE on acquisition policy.
- Making recommendations to the DAE on major programs designated as DAB programs.
- Promoting coordination, cooperation, and mutual understanding of matters related to the DOD Acquisition System.
- Making recommendations to streamline and improve the efficiency and effectiveness of the DOD Acquisition System.

DAB permanent members are: USD(A), Vice Chairman JCS, NAE and counterparts for the Army and Air Force, DOD Comptroller, ASD (Production and Logistics), DDR&E, ASD(PA&E), and the Chairs of DAB Acquisition Committees as appropriate.

Ad hoc members may be invited to participate in DAB activities if the Chair determines that their presence is required because of specific issues being considered.

Ref.: DOD Directive 5000.49

E9.2.1 DAB Acquisition Committees. The DAB is supported by 10 acquisition committees that provide assistance in program review and policy formulation. The missions and membership of each committee can be found in their respective charters. The appropriate DAB Acquisition Committee reviews DAB programs prior to a DAB meeting. These sessions are to identify, and where possible, reach consensus on issues; determine issues to be brought before the DAB; and to formulate recommendations for DAB consideration.

The 10 acquisition committees are as follows: Science and Technology; Nuclear and Chemical Weapons; Strategic Systems; Command, Control, Communications, and Intelligence; Test and Evaluation; Production and Logistics; Installation Support and Military Construction; International Programs; Policy and Initiative; and Conventional Systems.

Ref.: DOD Directive 5000.1, DODINST 5000.2

E9.3 Joint Services Automatic Testing-Executive Board (JSAT-EB). The JSAT-EB was established to review the Services' development, selection, acquisition, and logistics policies as they relate to automatic testing; to establish a comprehensive program to improve that process, to include developing and implementing a long-range, definitive action program on automatic testing; and to oversee and advise the Automatic Testing Technology Standardization (ATTS) Program. Objectives of the JSAT-EB include:

- Reduce proliferation of automatic test equipment (ATE) and dependence on off-line ATE.
- Improve management of ATE development and acquisition, and institutionalize and integrate improvements into the weapon system management process.
- Improve communication and exchange of information among the Services and industry in the areas of management, acquisition, testing technology, and training.
- Assure development, transition, and application of advancing testing technology to testing problems.
- Enhance standardization of the Services' automatic testing programs, including development of appropriate standards and specifications.

Ref.: OPNAV Instruction 3960.13; MCO 4081.1

E9.4 Naval Research Advisory Committee (NRAC). As the Navy Department's senior research advisory group, the Committee advises the Secretary of the Navy, the CNO, the Commandant of the Marine Corps, and the CNR with respect to research and its utilization by the Navy, and on questions of policy on Navy-wide problems in science. It particularly advises on trends and potentialities of research relating to naval operations and administration of departmental research and development programs.

The fifteen members of the Committee are persons in civilian life who are preeminent in the fields of science, research, and development work. They are appointed by the Secretary of the Navy and serve for such term or terms as SECNAV may specify. One member must be from the field of medicine.

An Executive Committee, reporting to ASN(R,E&S), is responsible for identification and formulation of proposed NRAC efforts. The Executive Committee consists of the Director R&DR,T&E, CNR, CG,MCRDAC, and two ASN(R,E&S) staff officers: the Principal Deputy ASN(R,E&S) and the Director Acquisition Management, International Programs, and Congressional Support.

Ref.: SECNAV Instruction 5420.79

E9.5 CNO Executive Board (CEB). The CEB's mission is to facilitate CNO decision-making by providing considered advice from senior advisors and deputies on issues of major importance.

The CEB consists of three permanent members: CNO, VCNO, and DCNO (Navy Program Planning). The Commandant of the Marine Corps is an associate member who may attend any sessions he considers of interest to his service. Ad hoc membership of the CEB includes other key principals whose advice is considered relevant to the issue under discussions.

Special panels of the CEB include the Ship Characteristics and Improvement Board (SCIB), Air Characteristics Improvement Board (ACIB), Advanced Technology Panel (ATP), Program Review Committee (PRC), Program Development

Review Committee (PDRC), Warfare Requirements Board (WRB), and Acquisition Review Council (ARC).

Ref.: OPNAV Instruction 5420.2

E9.5.1 Ship Characteristics and Improvement Board (SCIB). The SCIB assists the CNO in meeting those responsibilities pertaining to ship acquisition and improvement by coordinating the formulation of Navy shipbuilding and conversion programs and staffs all aspects of ship acquisition and improvement in order to provide recommendations to the CNO. The SCIB is responsible for coordination of the planning, programming, budgeting, and support necessary for the efficient and cost effective execution of those responsibilities.

Permanent members are OP-03 (Chairman), OP-02, OP-04, OP-05, OP-07, OP-08, SPAWAR 00, and NAVSEA 00.

E9.5.1.1 Surface Ship Survivability Group (SSSG). The SSSG, a sub-panel of the SCIB, formulates, coordinates, and promulgates CNO policies, plans, and programs to achieve the highest possible state of operational readiness and warfighting sustainability through improved (1) surface ship survivability (SSS), submarine survivability when applicable, (3) chemical, biological, and radiological defense (CBR-D), and (4) arctic cold-weather (A-CW) preparations. The SSSG also provides fiscal and acquisition continuity in the development and justification of POM and budget submissions for SSS, SBR-D, and A-CW projects.

Permanent members are OP- 03 (Chairman), OP-02, OP-04, OP-05, OP-07, OP-08, SPAWAR 00, and NAVSEA 00.

E9.5.2 Air Characteristics Improvement Board (ACIB). The ACIB assists the CNO in meeting those responsibilities pertaining to aircraft acquisition and improvement by coordinating the formulation of Engineering Change Proposals (ECP's), future requirements, modifications, cost control, and all other matters pertaining to aircraft, aircraft systems, and air launched weapons. The SCIB also staffs all aspects of aircraft acquisition and improvement including ILS and Navy Training Plan issues in order to provide recommendations to the CNO. The ACIB is responsible for coordination of the planning, programming, budgeting, and support necessary for efficient and cost effective execution of those responsibilities.

Permanent members are OP-05 (Chairman), OP-04, OP-09F, OP-098, NAVAIR-01, NAVAIR-09, CMC (AP), and representatives from OP-07, OP-80, OP-81, ASN(S&L), and ASN(R,E&S).

E9.5.3 Advanced Technology Panel (ATP). The ATP advises the CNO on issues identified by highly sensitive intelligence, future warfighting capabilities available through advanced technology, and innovative strategic thinking.

Permanent members are VCNO (Chairman), Assistant Commandant Marine Corps, OP-02, OP-03, OP-05, OP-06, OP-07, OP-08, OP-09X, OP-092, OP-094, OP-098, ASN(R,E&S), and NSA-(A-GROUP).

E9.5.4 Program Review Committee (PRC). The PRC reviews warfare appraisals and other POM development reviews not scheduled for presentation at CEB. The PRC makes POM recommendations to the CNO.

Permanent members are OP-08 (Chairman), OP-01, OP-02, OP-03, OP-04, OP-05, OP-06, OP-07, OP-092, OP-093, OP-094, OP-095, OP-096, OP-098, NAVSEA 00, NAVAIR 00, SPAWAR 00, NAVFAC 00, NAVSUP 00, OP-80, OP-81, OP-82, DC/S R&P Marine Corps, OPA, NCD, and Secretariat (Principal Deputies).

E9.5.5 Program Development Review Committee (PDRC). The PDRC reviews and coordinates each major step in the POM development process, reviews all warfare appraisals, SPPs, and other POM development

presentations and issues prior to review by the PRC and CEB.

Permanent members are OP- 80 (Chairman), OP-12, OP-02B, OP-03B, OP-04B, OP-05B, OP-60, OP-07B, OP-09B, OP-092, OP-931, OP-094B, OP-095B, OP-096, OP-098B, NAVFAC-09, NVASEA-09, NAVSUP-09, SPAWAR-09, NAVAIR-09, OP-81, OP-82, DC/S R&P Marine Corps, OPA, ONR, and Secretariat (Principal Deputies).

E9.5.6 Warfare Requirements Board (WRB). The WRB advises the CNO on warfare requirements, including mission development of top level warfare requirements, evaluation of warfighting effectiveness of proposed or existing warfare systems, force levels, and major cross-platform warfare matters.

Permanent members are OP-07 (Chairman), OP-02, OP-03, OP-04, OP-05, OP-06, OP-08, OP-092, OP-094, OP-098, and Deputy Fleet CINCs.

E9.5.7 Acquisition Review Council (ARC). The ARC conducts reviews of acquisition programs to resolve major issues such as operational requirements, testing, and funding issues prior to review at a Navy Program Decision Meeting (NPDM).

Permanent members are OP-08 (Chairman), OP-01, OP-04, OP-07, OP-098, OP-80, OP-81, OP-82, NCA, and DC/S R&P Marine Corps.

E9.6 Defense Resources Board (DRB). The primary role of the DRB is to help SECDEF manage the entire PPBS process.

DRB members are DEPSECDEF (Chairman); Chairman, JCS; secretaries of the Army, Navy, and Air Force; USD(P); USD(A); ASD(P&L); ASD(C^3I); DOD Comptroller; ASD(FM&P); ASD(International Security Affairs); ASD(International Security Policy); General Counsel; DOT&E; ASD(PA&E); Director (Strategic Defense Initiative Organization); and Associate Director OMB for National Security and International Affairs. The Service Chiefs are normally invited and usually attend meetings.

E9.7 Navy and Marine Corps Program Decision Meetings (NPDM/MCPDM). The NPDM/MCPDM is the DON forum for acquisition program milestone decisions and for program reviews when the Program Decision Authority (PDA) so directs.

NPDM/MCPDM participants for ACAT I and II programs include the NAE, and representatives from OASN(R,E&S) or OASN(S&L), Office of the General Counsel, OP-08, ASN (Financial Management), lead laboratory, Program Manager (program briefer), and NPDM/MCPDM Executive Secretary.

Participants for programs limited to either the Navy (NPDM) or Marine Corps (MCPDM) include:

- *NPDM*—CNO, OP-07, OP-04, PEO, COMOPTEVFOR, and OPNAV Sponsor.
- *MCPDM*—CMC; CG,MCRDAC; the Deputy Chiefs of Staff; the Fiscal Director; Commanding General, MCCDC; and the Director, C^4I Division. The Chairman may designate other principals to sit with the MCPDM when the system under consideration involves matters in their areas of cognizance.

For lower ACAT programs, the members listed above designate appropriate representatives.

Ref.: SECNAV Instruction 5420.188

E9.8 Acquisition Review Board (ARB). The ARB, normally convened by a SYSCOM, reviews acquisition programs, provides advice and guidance to acquisition managers, and recommends alternative courses of action. For ACAT IV programs, the SYSCOM ARB is the single decision forum. ARB activities are intended to

complement the review processes established by higher headquarters for major programs and selectively provide SYSCOM-level review for acquisition programs of all categories.

E9.9 Board for Naval Studies-National Academy of Sciences. With appropriate attention to the influence of domestic economy, national objectives, social imperatives, and anticipated military requirements, the Board for Naval Studies of the National Academy of Sciences conducts and reports upon surveys and studies in the field of scientific research and development applicable to the operation and function of the Navy. Each particular project undertaken by the Board within his mission is precisely defined and mutually agreed to by the Board and the Director, RDT&E (OP-098) acting for the Assistant Secretary of the Navy (R,E&S).

E9.10 DON Program Strategy Board (DPSB). The DPSB, chaired by SECNAV, develops strategies, resolves issues, and reviews programs at the top level of DON management. Members are SECNAV, UNDERSECNAV, CNO, CMC, OP-08, OP-90, OPA, DC/S(R&P), Marine Corps, ASN(R,E&S), ASN(M&RA), and ASN(FM).

POM 92-1

Appendix F
NAVY SYSTEMS ACQUISITION PROCESS OUTLINES

The flow charts on the following pages provide an overview of the major steps in the DON's process for acquisition of systems. Variations in the process for each acquisition category are displayed. The flow charts summarize the information presented in Section 2.5 of this Guide.

The flow charts identify officials and special groups, planning and control documents, and the process and time of review and approval. Governing directives and other sources of in-depth information are listed in "Selected References" below.

A listing of the flow charts follows:

SELECTED REFERENCES ON THE SYSTEMS ACQUISITION PROCESS

Department of the Navy Programming Manual provides in-depth information on the PPBS process in general and the POM process in particular.

DOD Instruction 7045.7, "Implementation of the Planning, Programming, and Budgeting System (PPBS)," provides official guidance on the POM process.

DOD Directive 5000.1, "Major and Non-Major Defense Acquisition Programs," established fundamental overall policy for systems development and acquisition. The management principles in the directive are applicable to all programs.

DOD Directive 5000.2, "Defense Acquisition Program Procedures."

DOD Directive 5000.3, "Test and Evaluation."

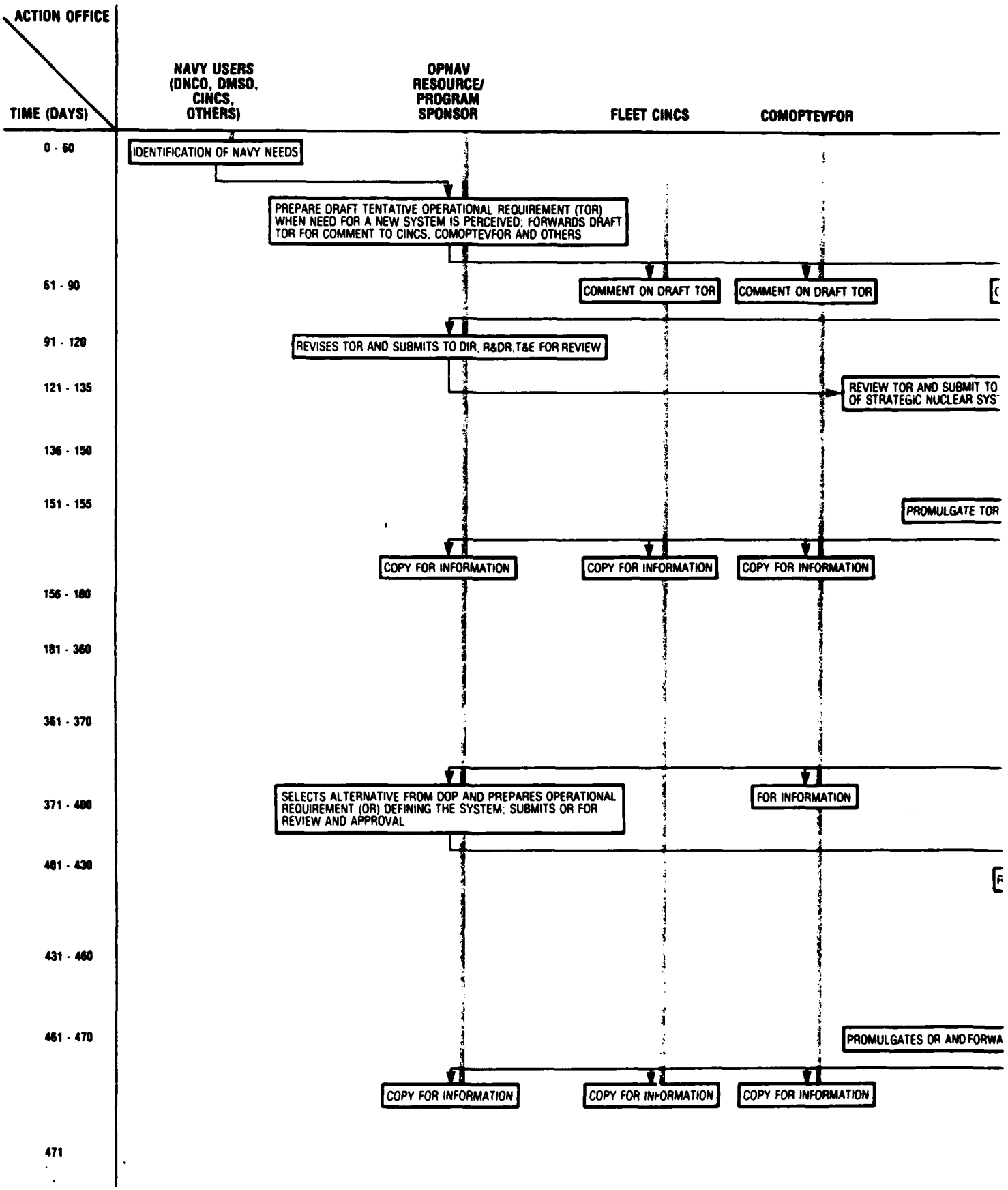
SECNAV Instruction 5000.1, "Major and Non-Major Acquisition Program."

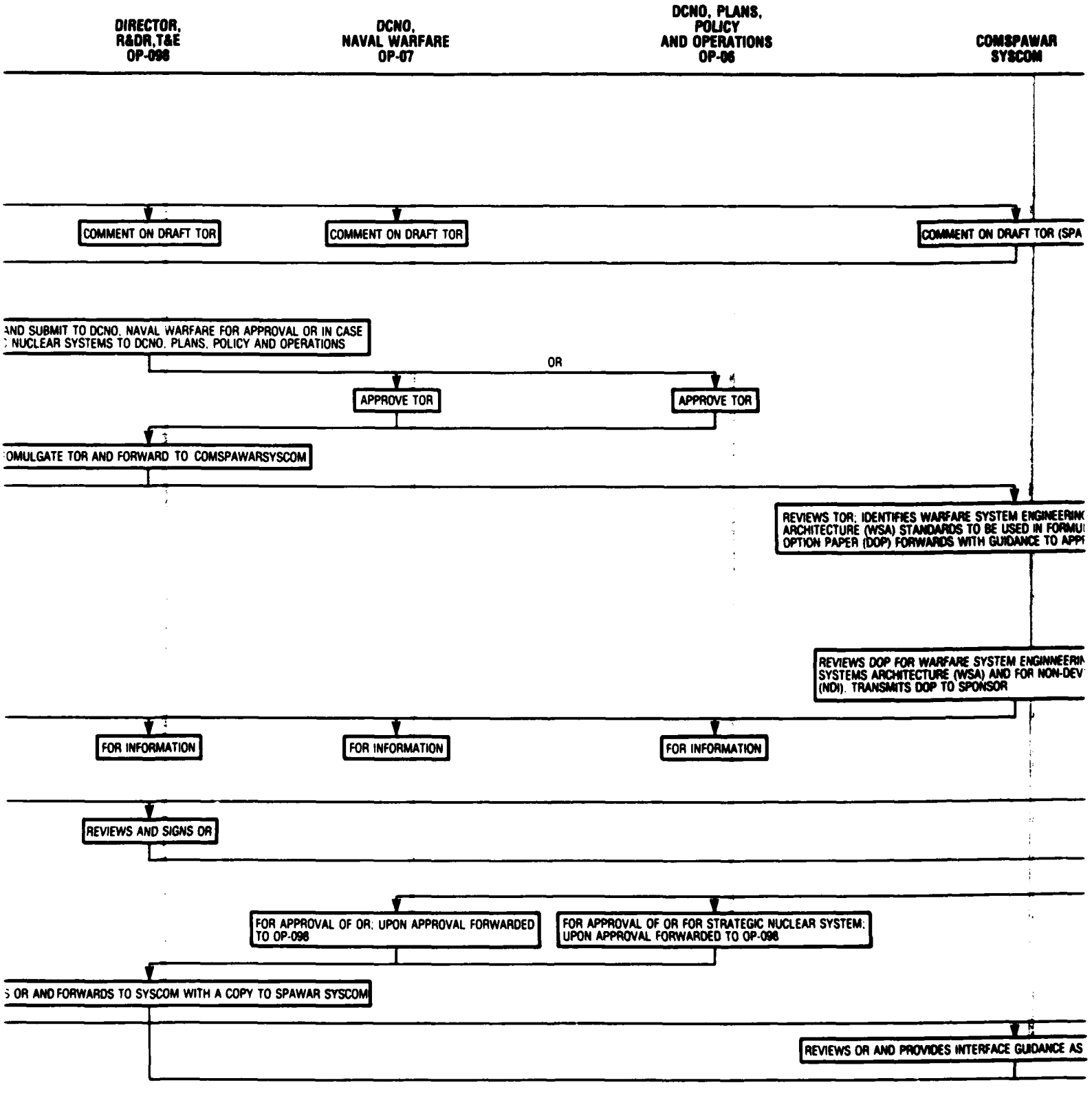
SECNAV Instruction 5000.2, "Major and Non-Major Acquisition Program Procedures."

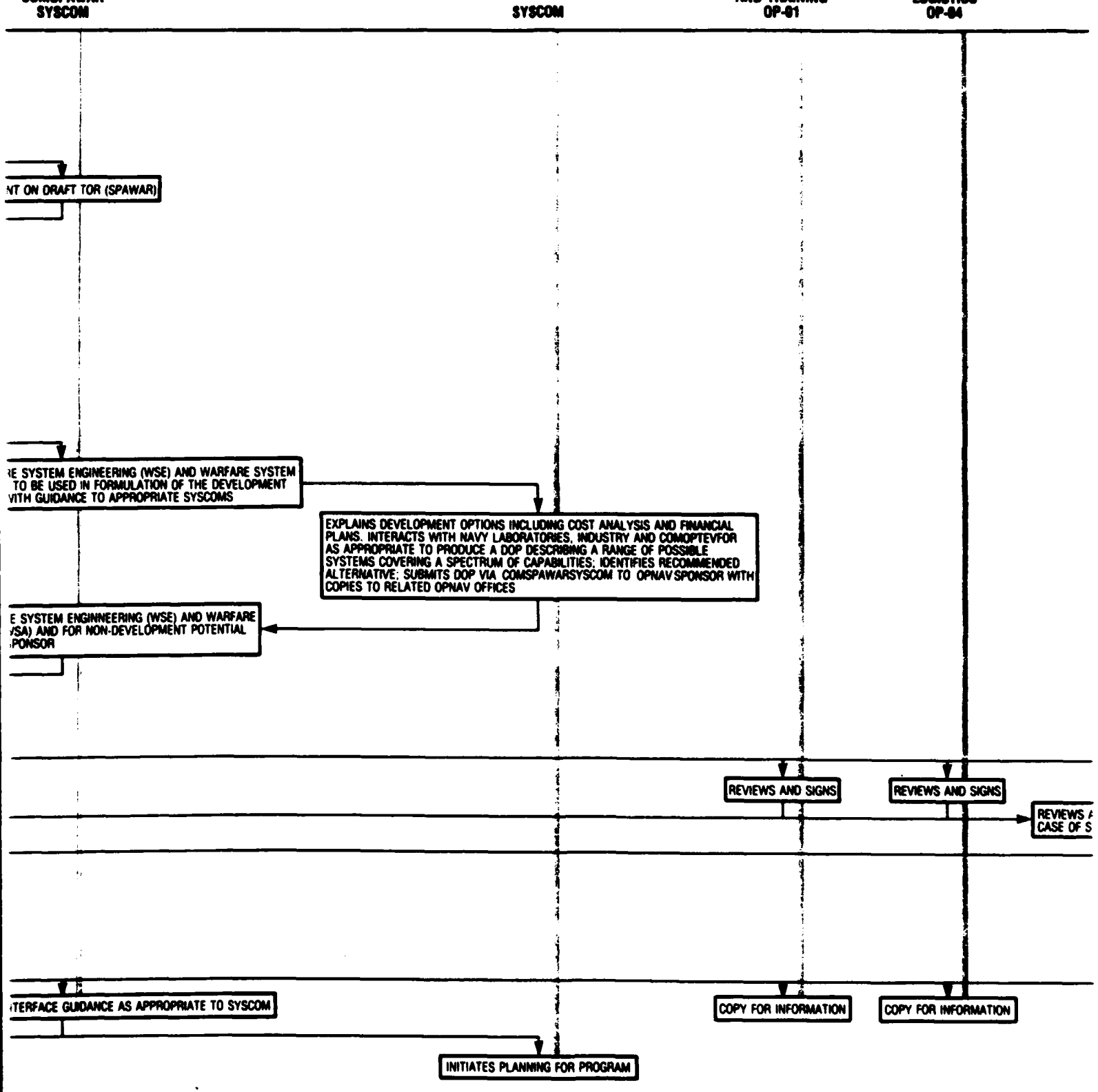
SECNAV Instruction 5420.188, "Navy and Marine Corps Decision Meetings (NPDM/MCPDM).

OPNAV Instruction 5000.42, "Research, Development and Acquisition Procedures."

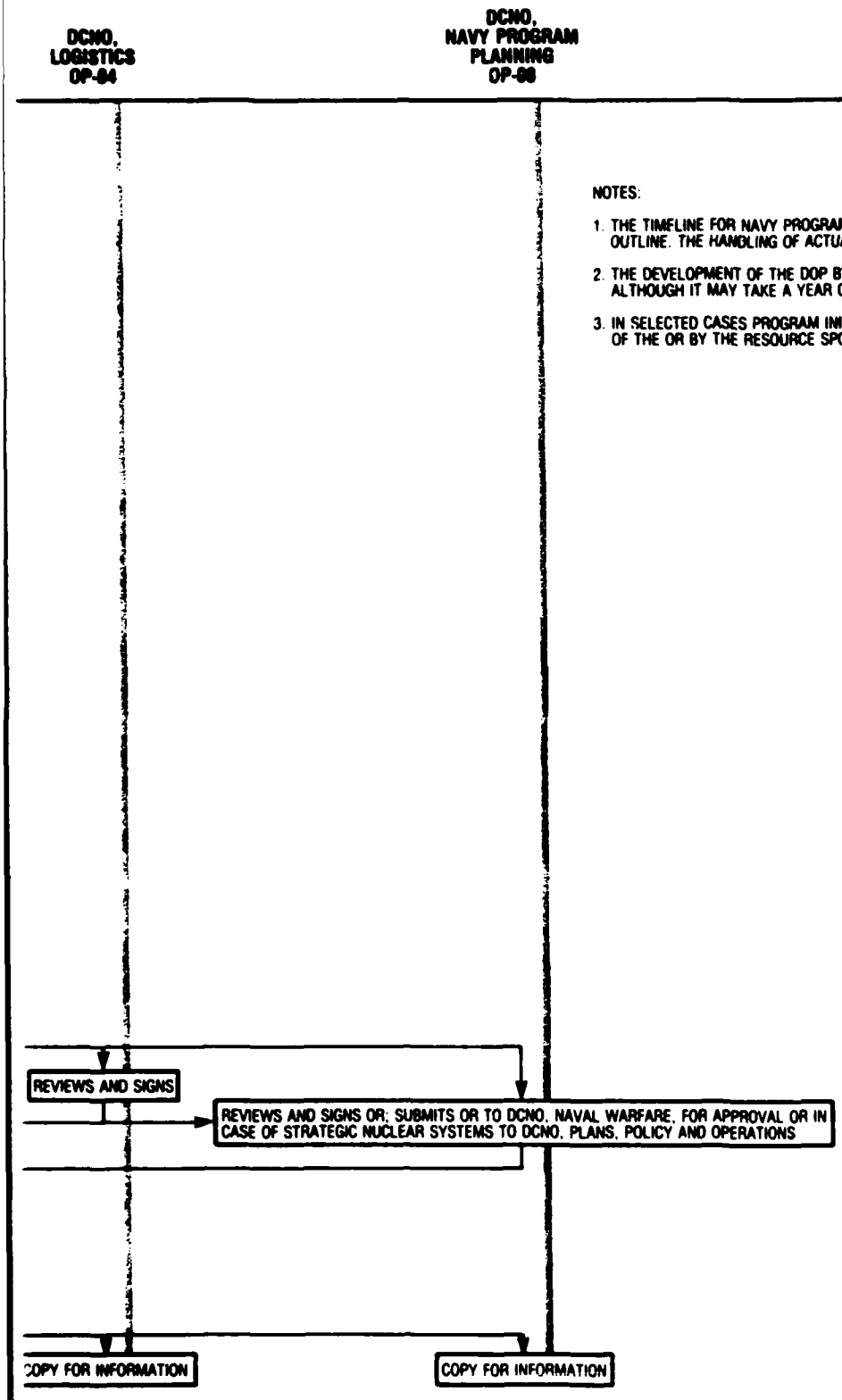
For specific information on aspects of the process, consult the directives referenced following the various portions of Section 2.5.


ACTION OFFICE
TIME (DAYS)
NAVY USERS (DNCO, DMSO, CINCS, OTHERS)
OPNAV RESOURCE/ PROGRAM SPONSOR
FLEET CINCS
COMOPTEVFOR
0 - 60
IDENTIFICATION OF NAVY NEEDS
PREPARE DRAFT TENTATIVE OPERATIONAL REQUIREMENT (TOR) WHEN NEED FOR A NEW SYSTEM IS PERCEIVED; FORWARDS DRAFT TOR FOR COMMENT TO CINCS, COMOPTEVFOR AND OTHERS
61 - 90
COMMENT ON DRAFT TOR
COMMENT ON DRAFT TOR
91 - 120
REVISES TOR AND SUBMITS TO DIR, R&DR,T&E FOR REVIEW
121 - 135
REVIEW TOR AND SUBMIT TO
OF STRATEGIC NUCLEAR SYS
136 - 150
151 - 155
PROMULGATE TOR
COPY FOR INFORMATION
COPY FOR INFORMATION
COPY FOR INFORMATION
156 - 180
181 - 360
361 - 370
371 - 400
SELECTS ALTERNATIVE FROM DOP AND PREPARES OPERATIONAL REQUIREMENT (OR) DEFINING THE SYSTEM; SUBMITS OR FOR REVIEW AND APPROVAL
FOR INFORMATION
401 - 430
431 - 460
461 - 470
PROMULGATES OR AND FORWA
COPY FOR INFORMATION
COPY FOR INFORMATION
COPY FOR INFORMATION
471


DIRECTOR, R&DR,T&E OP-098
DCNO, NAVAL WARFARE OP-07
DCNO, PLANS, POLICY AND OPERATIONS OP-06
COMSPAWAR SYSCOM
COMMENT ON DRAFT TOR
COMMENT ON DRAFT TOR
COMMENT ON DRAFT TOR (SPA
ND SUBMIT TO DCNO, NAVAL WARFARE FOR APPROVAL OR IN CASE
NUCLEAR SYSTEMS TO DCNO, PLANS, POLICY AND OPERATIONS
OR
APPROVE TOR
APPROVE TOR
OMULGATE TOR AND FORWARD TO COMSPAWARSYSCOM
REVIEWS TOR; IDENTIFIES WARFARE SYSTEM ENGINEERIN
ARCHITECTURE (WSA) STANDARDS TO BE USED IN FORMU
OPTION PAPER (DOP) FORWARDS WITH GUIDANCE TO APP
REVIEWS DOP FOR WARFARE SYSTEM ENGINNEERIN
SYSTEMS ARCHITECTURE (WSA) AND FOR NON-DEV
(NDI). TRANSMITS DOP TO SPONSOR
FOR INFORMATION
FOR INFORMATION
FOR INFORMATION
REVIEWS AND SIGNS OR
FOR APPROVAL OF OR; UPON APPROVAL FORWARDED TO OP-098
FOR APPROVAL OF OR FOR STRATEGIC NUCLEAR SYSTEM; UPON APPROVAL FORWARDED TO OP-098
S OR AND FORWARDS TO SYSCOM WITH A COPY TO SPAWAR SYSCOM
REVIEWS OR AND PROVIDES INTERFACE GUIDANCE AS


COMSPAWAR SYSCOM
SYSCOM
DCNO, MANPOWER, PERSONNEL AND TRAINING OP-01
DCNO, LOGISTICS OP-04
NT ON DRAFT TOR (SPAWAR)
E SYSTEM ENGINEERING (WSE) AND WARFARE SYSTEM TO BE USED IN FORMULATION OF THE DEVELOPMENT VITH GUIDANCE TO APPROPRIATE SYSCOMS
EXPLAINS DEVELOPMENT OPTIONS INCLUDING COST ANALYSIS AND FINANCIAL PLANS. INTERACTS WITH NAVY LABORATORIES, INDUSTRY AND COMOPTEVFOR AS APPROPRIATE TO PRODUCE A DOP DESCRIBING A RANGE OF POSSIBLE SYSTEMS COVERING A SPECTRUM OF CAPABILITIES; IDENTIFIES RECOMMENDED ALTERNATIVE; SUBMITS DOP VIA COMSPAWARSYSCOM TO OPNAV SPONSOR WITH COPIES TO RELATED OPNAV OFFICES
E SYSTEM ENGINNEERING (WSE) AND WARFARE /SA) AND FOR NON-DEVELOPMENT POTENTIAL PONSOR
REVIEWS AND SIGNS
REVIEWS AND SIGNS
REVIEWS A CASE OF S
TERFACE GUIDANCE AS APPROPRIATE TO SYSCOM
COPY FOR INFORMATION
COPY FOR INFORMATION
INITIATES PLANNING FOR PROGRAM

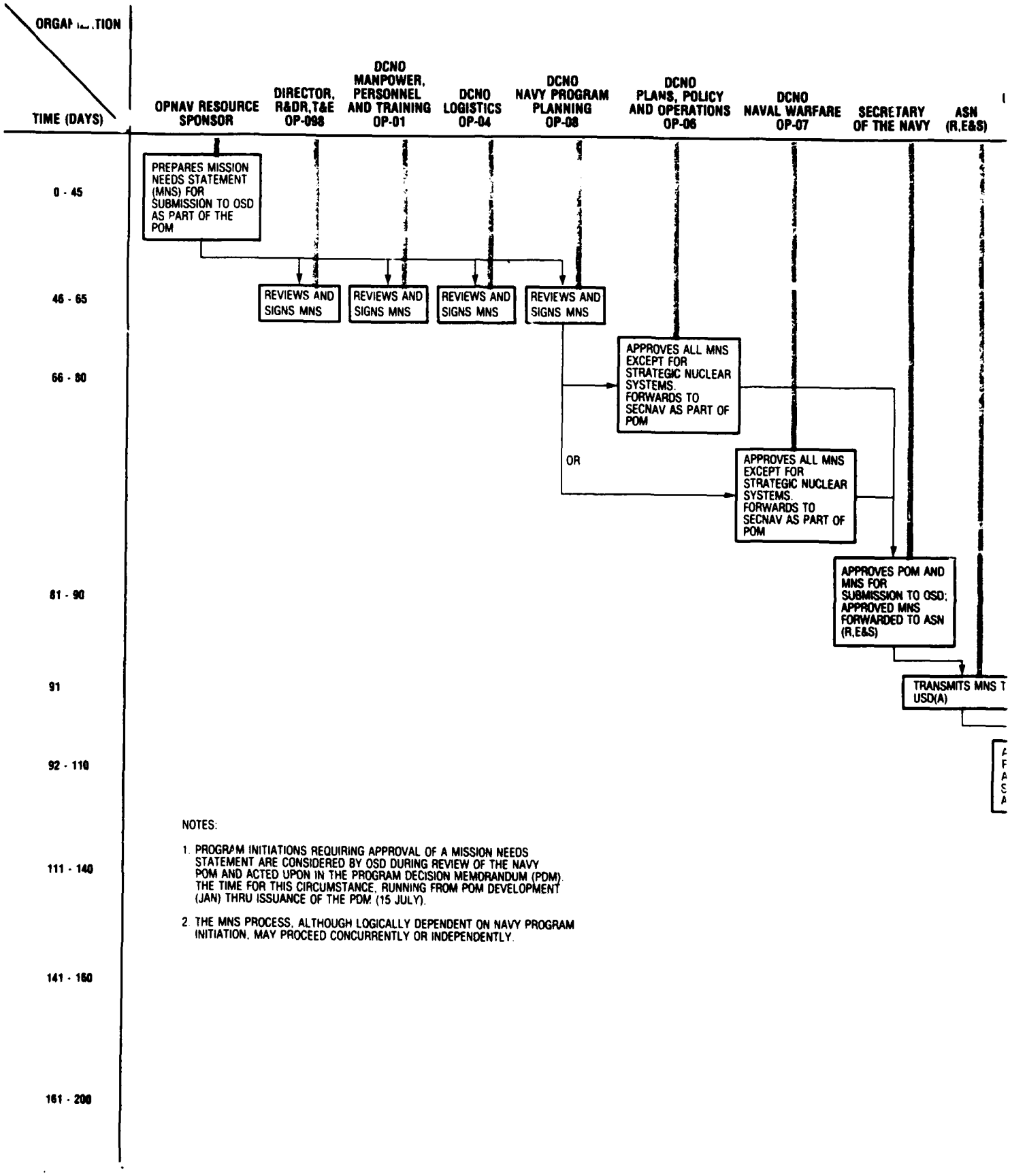
F-3 C



NOTES:

1. THE TIMELINE FOR NAVY PROGRAM INITIATED PRESENTED HERE IS A NATIONAL OUTLINE. THE HANDLING OF ACTUAL PROGRAMS MAY VARY WIDELY FROM THIS SCHEME.
2. THE DEVELOPMENT OF THE DOP BY THE SYSCOM IS ESTIMATED TO TAKE SIX MONTHS ALTHOUGH IT MAY TAKE A YEAR OR MORE AND IN OTHER CASES IS BYPASSED.
3. IN SELECTED CASES PROGRAM INITIATION MAY COMMENCE WITH THE PREPARATION OF THE OR BY THE RESOURCE SPONSOR BYPASSING BOTH THE TOR AND DOP STEPS.

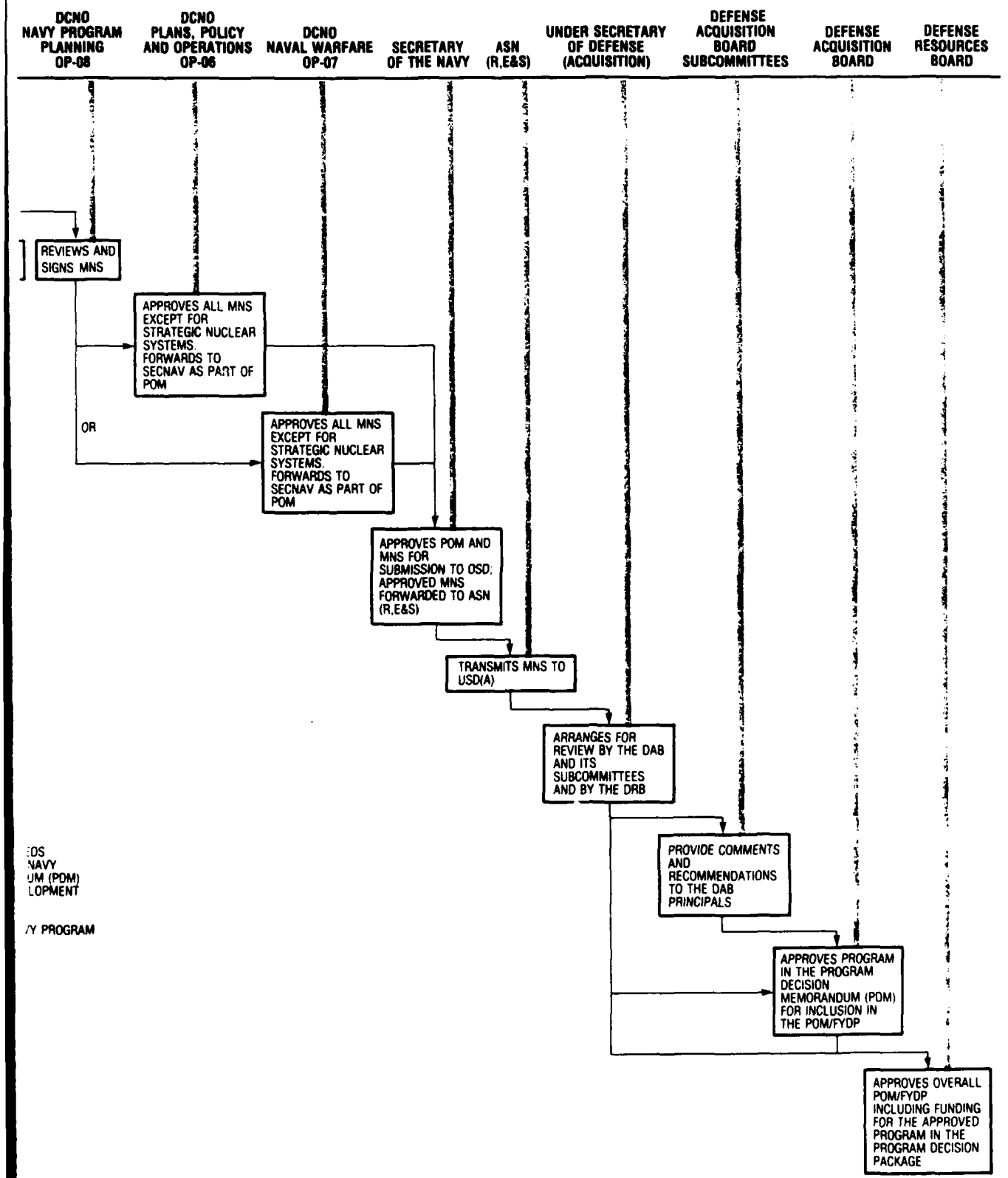
Exhibit F-1
ACQUISITION PROCESS OUTLINE
NAVY PROGRAM INITIATION



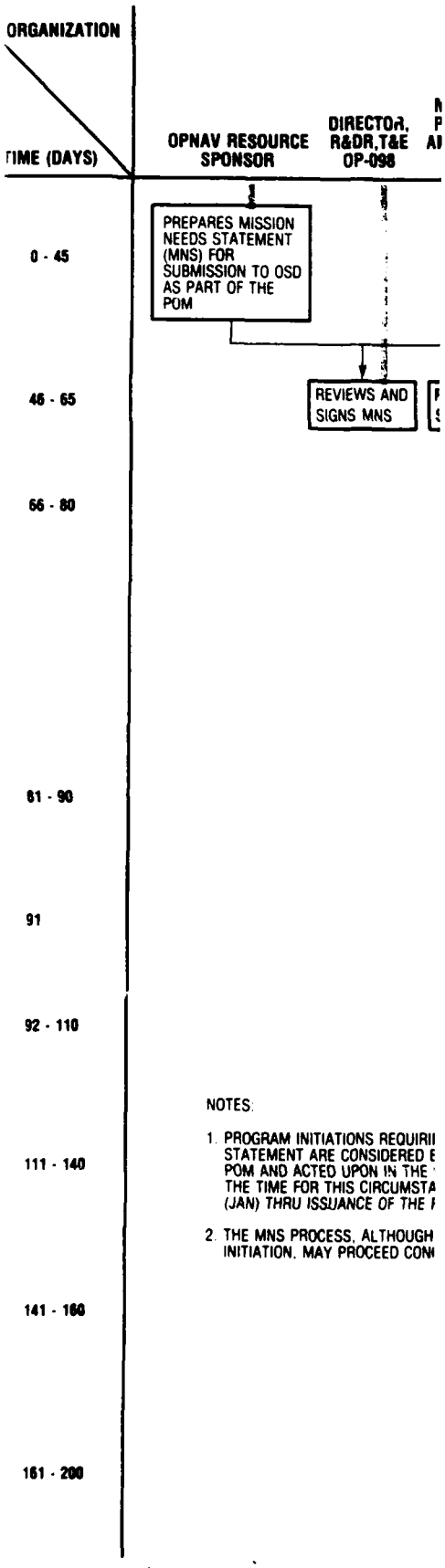
NOTES:

1. PROGRAM INITIATIONS REQUIRING APPROVAL OF A MISSION NEEDS STATEMENT ARE CONSIDERED BY OSD DURING REVIEW OF THE NAVY POM AND ACTED UPON IN THE PROGRAM DECISION MEMORANDUM (PDM). THE TIME FOR THIS CIRCUMSTANCE, RUNNING FROM POM DEVELOPMENT (JAN) THRU ISSUANCE OF THE PDM (15 JULY).

2. THE MNS PROCESS, ALTHOUGH LOGICALLY DEPENDENT ON NAVY PROGRAM INITIATION, MAY PROCEED CONCURRENTLY OR INDEPENDENTLY.


DCNO NAVY PROGRAM PLANNING OP-08
DCNO PLANS, POLICY AND OPERATIONS OP-06
DCNO NAVAL WARFARE OP-07
SECRETARY OF THE NAVY
ASN (R,E&S)
UNDER SECRETARY OF DEFENSE (ACQUISITION)
DEFENSE ACQUISITION BOARD SUBCOMMITTEES
DEFENSE ACQUISITION BOARD
DEFENSE RESOURCES BOARD
REVIEWS AND SIGNS MNS
APPROVES ALL MNS EXCEPT FOR STRATEGIC NUCLEAR SYSTEMS. FORWARDS TO SECNAV AS PART OF POM
OR
APPROVES ALL MNS EXCEPT FOR STRATEGIC NUCLEAR SYSTEMS. FORWARDS TO SECNAV AS PART OF POM
APPROVES POM AND MNS FOR SUBMISSION TO OSD; APPROVED MNS FORWARDED TO ASN (R,E&S)
TRANSMITS MNS TO USD(A)
ARRANGES FOR REVIEW BY THE DAB AND ITS SUBCOMMITTEES AND BY THE DRB
PROVIDE COMMENTS AND RECOMMENDATIONS TO THE DAB PRINCIPALS
APPROVES PROGRAM IN THE PROGRAM DECISION MEMORANDUM (PDM) FOR INCLUSION IN THE POM/FYDP
APPROVES OVERALL POM/FYDP INCLUDING FUNDING FOR THE APPROVED PROGRAM IN THE PROGRAM DECISION PACKAGE
:DS
NAVY
UM (PDM)
LOPMENT
/Y PROGRAM

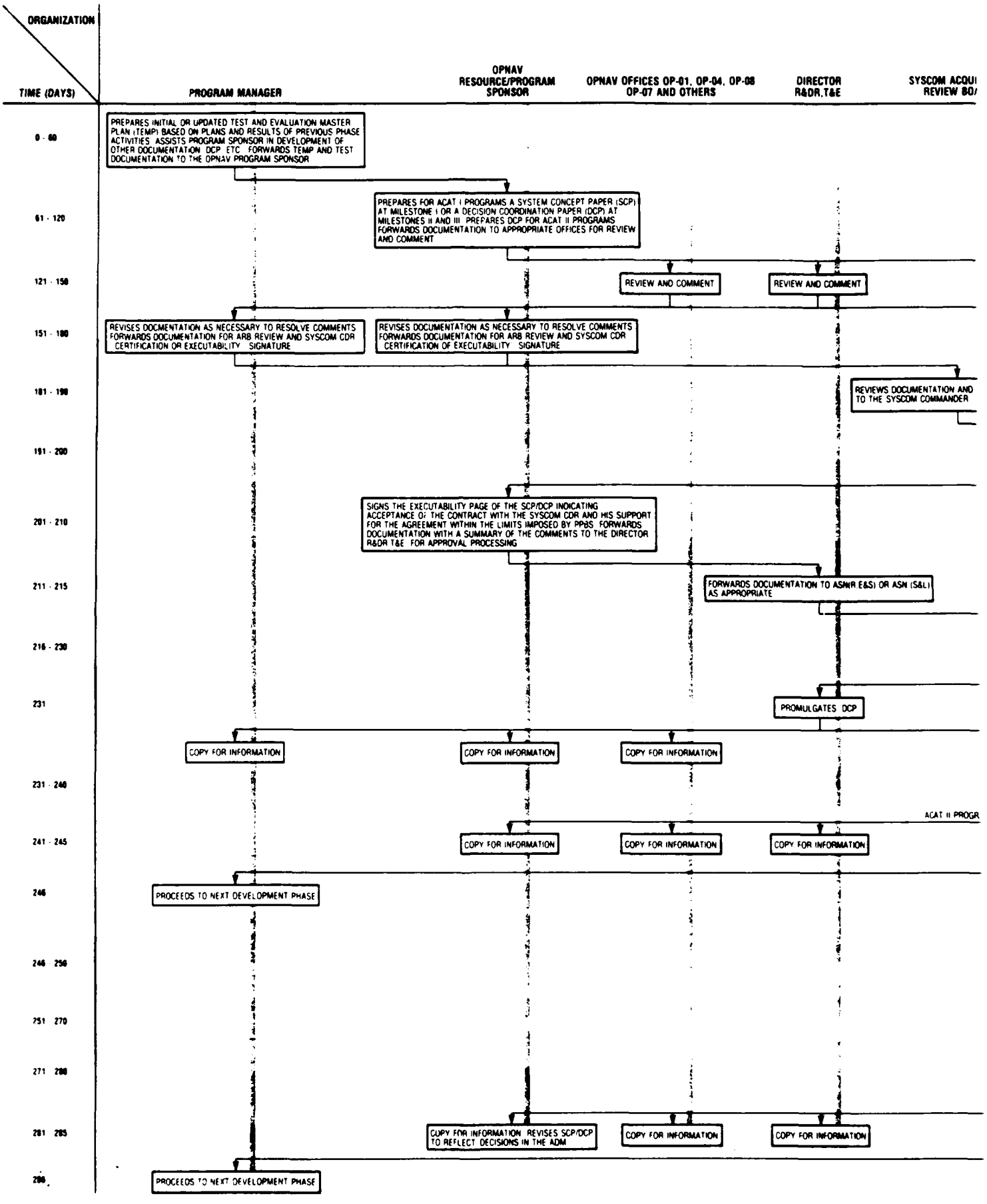
F-5 B

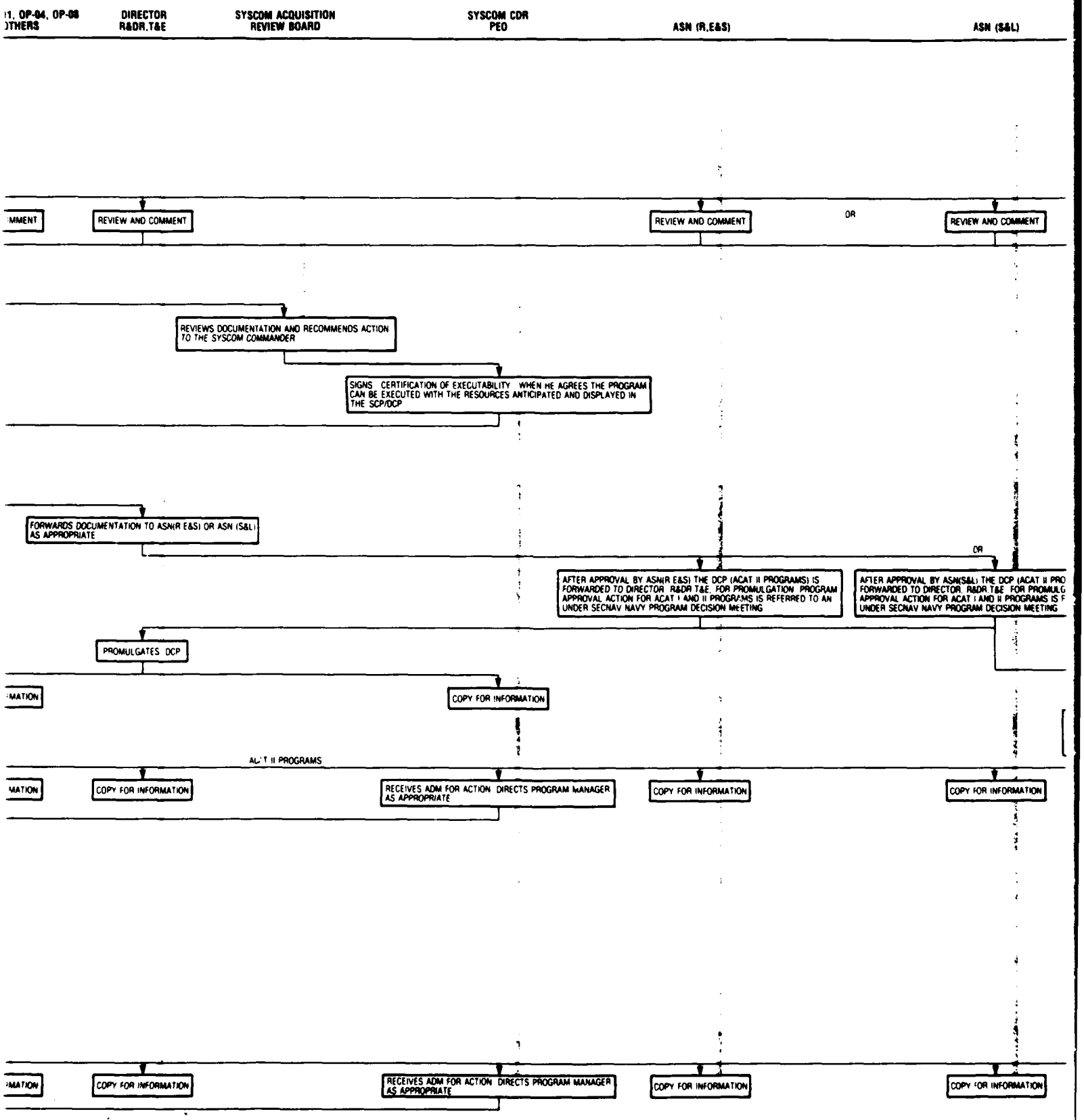


NOTES:

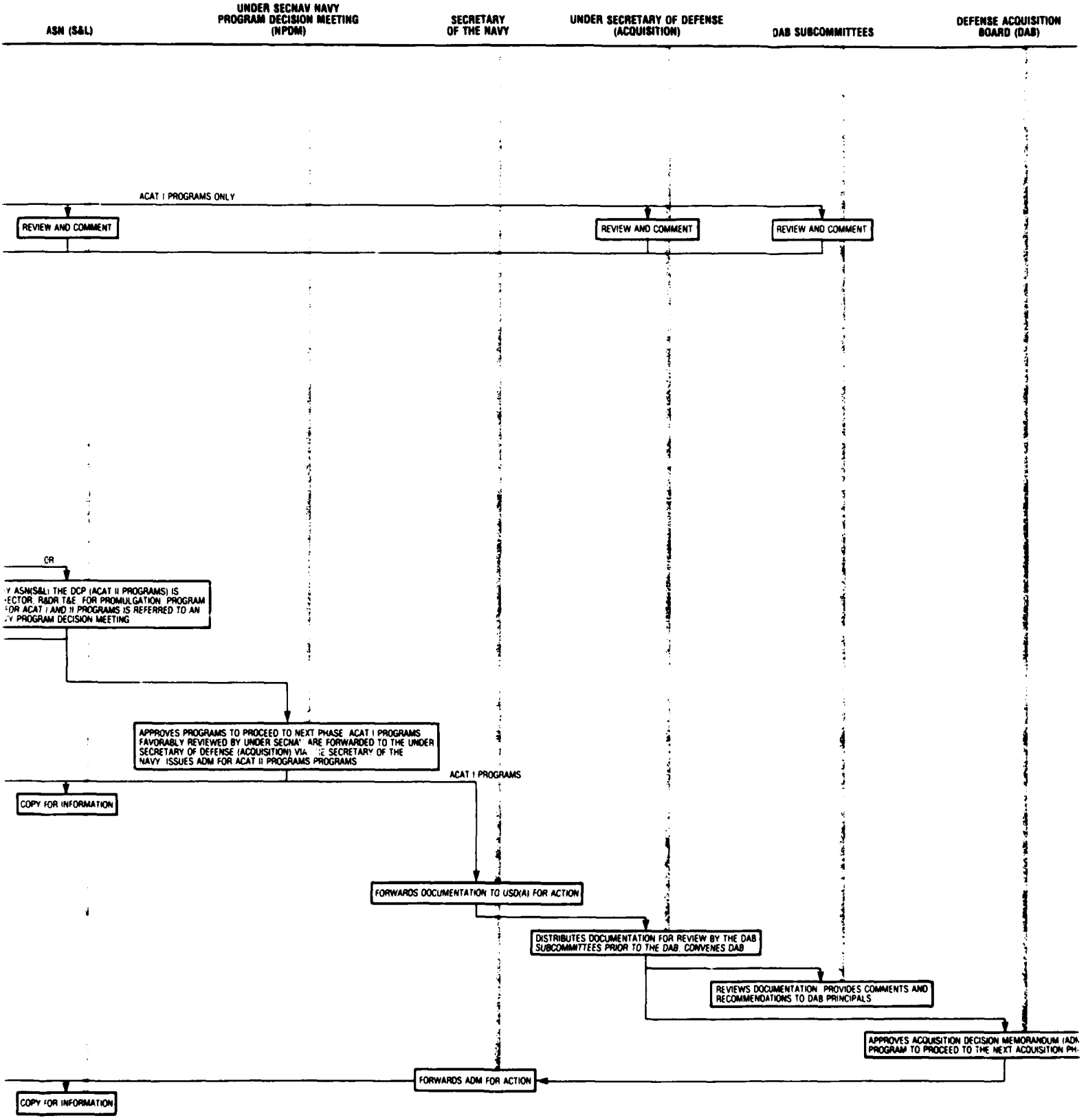
1. PROGRAM INITIATIONS REQUIRI STATEMENT ARE CONSIDERED E POM AND ACTED UPON IN THE THE TIME FOR THIS CIRCUMSTA (JAN) THRU ISSUANCE OF THE F
2. THE MNS PROCESS, ALTHOUGH INITIATION, MAY PROCEED CONI

Exhibit F-2
ACQUISITION PROCESS OUTLINE
OSD APPROVAL OF NAVY PROGRAM INITIATION ACAT I PROGRAMS

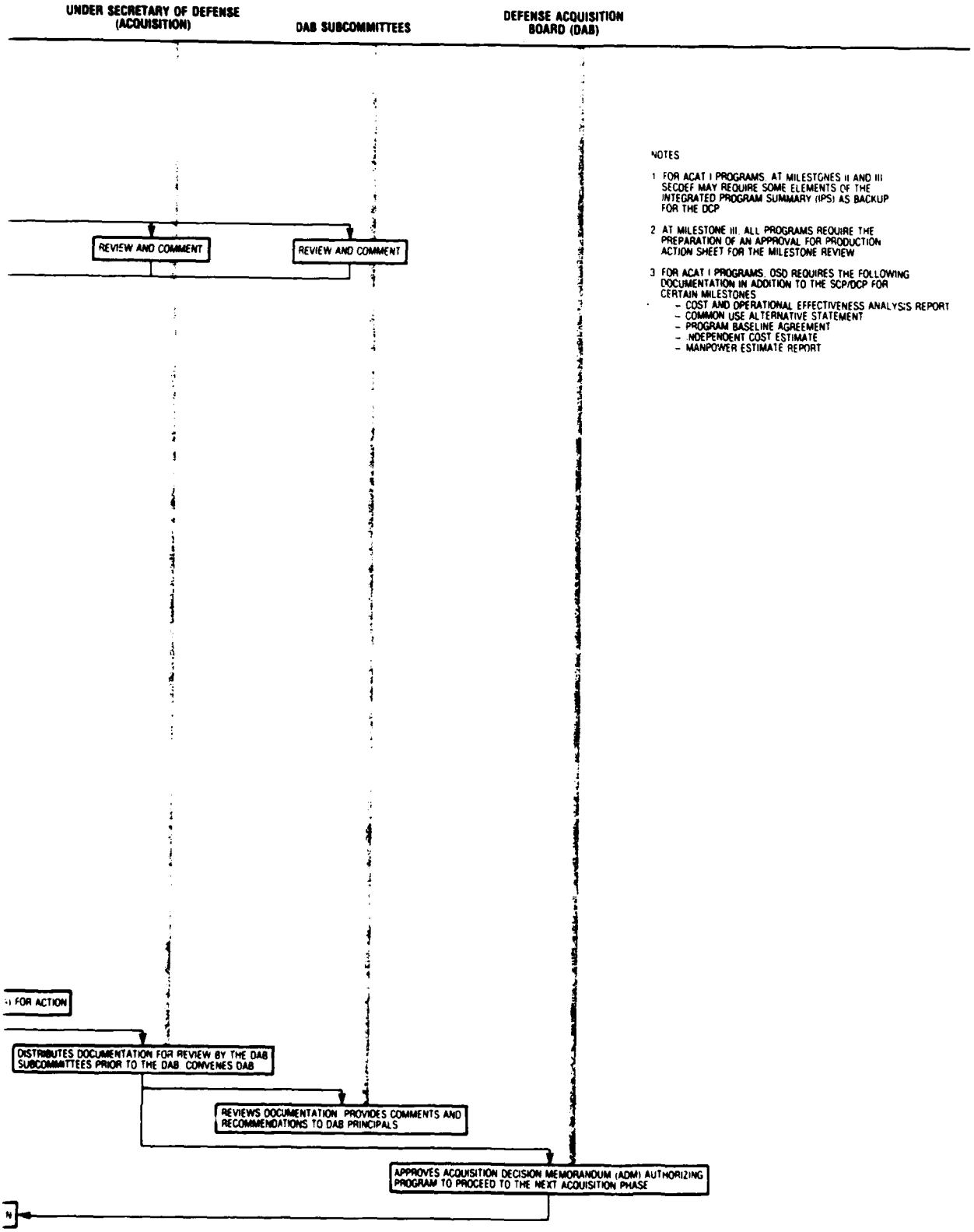

ORGANIZATION
TIME (DAYS)
PROGRAM MANAGER
OPNAV RESOURCE/PROGRAM SPONSOR
OPNAV OFFICES OP-01, OP-04, OP-08 OP-07 AND OTHERS
DIRECTOR R&DR,T&E
SYSCOM ACQUI REVIEW BO/
0 - 60
PREPARES INITIAL OR UPDATED TEST AND EVALUATION MASTER PLAN (TEMP) BASED ON PLANS AND RESULTS OF PREVIOUS PHASE ACTIVITIES ASSISTS PROGRAM SPONSOR IN DEVELOPMENT OF OTHER DOCUMENTATION DCP ETC FORWARDS TEMP AND TEST DOCUMENTATION TO THE OPNAV PROGRAM SPONSOR
61 - 120
PREPARES FOR ACAT I PROGRAMS A SYSTEM CONCEPT PAPER (SCP) AT MILESTONE I OR A DECISION COORDINATION PAPER (DCP) AT MILESTONES II AND III PREPARES DCP FOR ACAT II PROGRAMS FORWARDS DOCUMENTATION TO APPROPRIATE OFFICES FOR REVIEW AND COMMENT
121 - 150
REVIEW AND COMMENT
REVIEW AND COMMENT
151 - 180
REVISES DOCMENTATION AS NECESSARY TO RESOLVE COMMENTS FORWARDS DOCUMENTATION FOR ARB REVIEW AND SYSCOM CDR CERTIFICATION OR EXECUTABILITY SIGNATURE
REVISES DOCUMENTATION AS NECESSARY TO RESOLVE COMMENTS FORWARDS DOCUMENTATION FOR ARB REVIEW AND SYSCOM CDR CERTIFICATION OF EXECUTABILITY SIGNATURE
181 - 190
REVIEWS DOCUMENTATION AND TO THE SYSCOM COMMANDER
191 - 200
201 - 210
SIGNS THE EXECUTABILITY PAGE OF THE SCP/DCP INDICATING ACCEPTANCE OF THE CONTRACT WITH THE SYSCOM CDR AND HIS SUPPORT FOR THE AGREEMENT WITHIN THE LIMITS IMPOSED BY PPBS FORWARDS DOCUMENTATION WITH A SUMMARY OF THE COMMENTS TO THE DIRECTOR R&DR T&E FOR APPROVAL PROCESSING
211 - 215
FORWARDS DOCUMENTATION TO ASN(R E&S) OR ASN (S&L) AS APPROPRIATE
216 - 230
231
PROMULGATES DCP
COPY FOR INFORMATION
COPY FOR INFORMATION
COPY FOR INFORMATION
231 - 240
ACAT II PROGR
241 - 245
COPY FOR INFORMATION
COPY FOR INFORMATION
COPY FOR INFORMATION
246
PROCEEDS TO NEXT DEVELOPMENT PHASE
246 - 250
251 - 270
271 - 280
281 - 285
COPY FOR INFORMATION REVISES SCP/DCP TO REFLECT DECISIONS IN THE ADM
COPY FOR INFORMATION
COPY FOR INFORMATION
286
PROCEEDS TO NEXT DEVELOPMENT PHASE


)1, OP-04, OP-08
)THERS
DIRECTOR R&DR,T&E
SYSCOM ACQUISITION REVIEW BOARD
SYSCOM CDR PEO
ASN (R,E&S)
ASN (S&L)
:MMENT
REVIEW AND COMMENT
REVIEW AND COMMENT
OR
REVIEW AND COMMENT
REVIEWS DOCUMENTATION AND RECOMMENDS ACTION TO THE SYSCOM COMMANDER
SIGNS CERTIFICATION OF EXECUTABILITY WHEN HE AGREES THE PROGRAM CAN BE EXECUTED WITH THE RESOURCES ANTICIPATED AND DISPLAYED IN THE SCP/DCP
FORWARDS DOCUMENTATION TO ASN(R E&S) OR ASN (S&L) AS APPROPRIATE
OR
AFTER APPROVAL BY ASN(R E&S) THE DCP (ACAT II PROGRAMS) IS FORWARDED TO DIRECTOR R&DR T&E FOR PROMULGATION PROGRAM APPROVAL ACTION FOR ACAT I AND II PROGRAMS IS REFERRED TO AN UNDER SECNAV NAVY PROGRAM DECISION MEETING
AFTER APPROVAL BY ASN(S&L) THE DCP (ACAT II PRO FORWARDED TO DIRECTOR R&DR T&E FOR PROMULG APPROVAL ACTION FOR ACAT I AND II PROGRAMS IS F UNDER SECNAV NAVY PROGRAM DECISION MEETING
PROMULGATES DCP
:MATION
COPY FOR INFORMATION
ACAT II PROGRAMS
MATION
COPY FOR INFORMATION
RECEIVES ADM FOR ACTION DIRECTS PROGRAM MANAGER AS APPROPRIATE
COPY FOR INFORMATION
COPY FOR INFORMATION
:MATION
COPY FOR INFORMATION
RECEIVES ADM FOR ACTION DIRECTS PROGRAM MANAGER AS APPROPRIATE
COPY FOR INFORMATION
COPY FOR INFORMATION

F-7 B

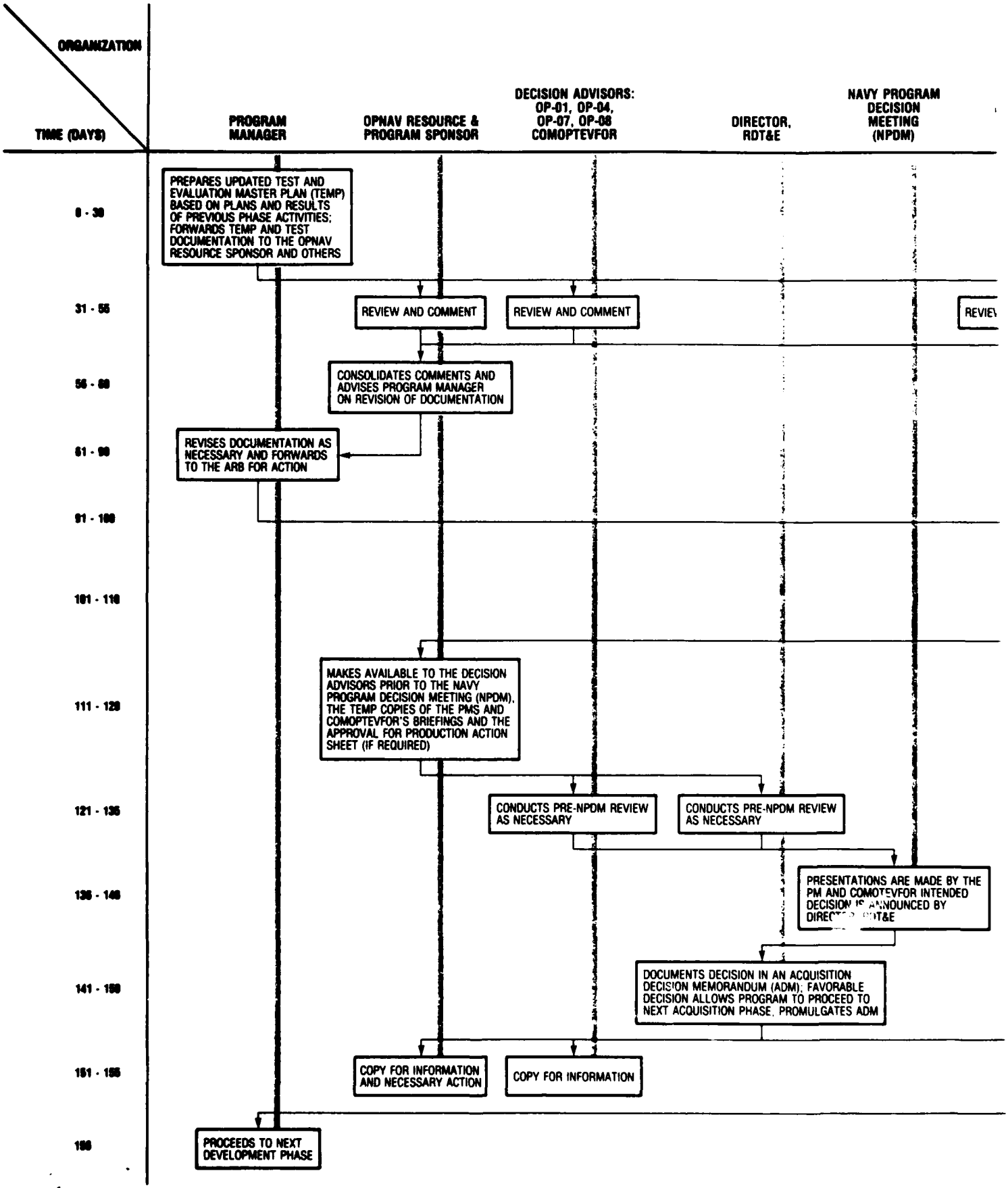

ASN (S&L)
UNDER SECNAV NAVY PROGRAM DECISION MEETING (NPDM)
SECRETARY OF THE NAVY
UNDER SECRETARY OF DEFENSE (ACQUISITION)
DAB SUBCOMMITTEES
DEFENSE ACQUISITION BOARD (DAB)
ACAT I PROGRAMS ONLY
REVIEW AND COMMENT
REVIEW AND COMMENT
REVIEW AND COMMENT
CR
Y ASN(S&L) THE DCP (ACAT II PROGRAMS) IS
ECTOR, R&DR T&E FOR PROMULGATION PROGRAM
OR ACAT I AND II PROGRAMS IS REFERRED TO AN
Y PROGRAM DECISION MEETING
APPROVES PROGRAMS TO PROCEED TO NEXT PHASE ACAT I PROGRAMS FAVORABLY REVIEWED BY UNDER SECNA ARE FORWARDED TO THE UNDER SECRETARY OF DEFENSE (ACQUISITION) VIA E SECRETARY OF THE NAVY ISSUES ADM FOR ACAT II PROGRAMS PROGRAMS
ACAT I PROGRAMS
COPY FOR INFORMATION
FORWARDS DOCUMENTATION TO USD(A) FOR ACTION
DISTRIBUTES DOCUMENTATION FOR REVIEW BY THE DAB SUBCOMMITTEES PRIOR TO THE DAB CONVENES DAB
REVIEWS DOCUMENTATION PROVIDES COMMENTS AND RECOMMENDATIONS TO DAB PRINCIPALS
APPROVES ACQUISITION DECISION MEMORANDUM (ADM PROGRAM TO PROCEED TO THE NEXT ACQUISITION PH
FORWARDS ADM FOR ACTION
COPY FOR INFORMATION

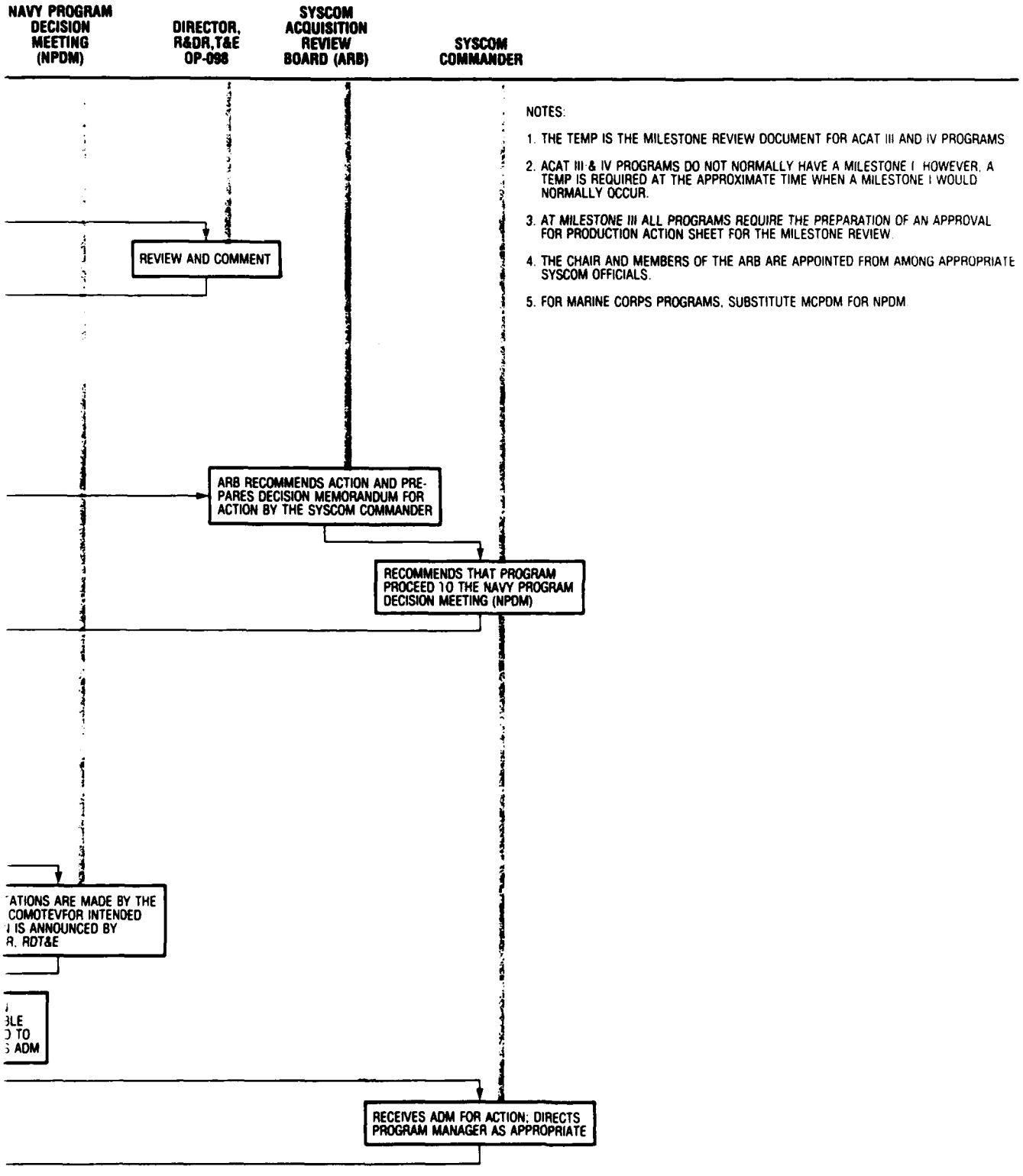
F-7 C


UNDER SECRETARY OF DEFENSE (ACQUISITION)
DAB SUBCOMMITTEES
DEFENSE ACQUISITION BOARD (DAB)
REVIEW AND COMMENT
REVIEW AND COMMENT
NOTES
1 FOR ACAT I PROGRAMS, AT MILESTONES II AND III SECDEF MAY REQUIRE SOME ELEMENTS OF THE INTEGRATED PROGRAM SUMMARY (IPS) AS BACKUP FOR THE DCP
2 AT MILESTONE III, ALL PROGRAMS REQUIRE THE PREPARATION OF AN APPROVAL FOR PRODUCTION ACTION SHEET FOR THE MILESTONE REVIEW
3 FOR ACAT I PROGRAMS, OSD REQUIRES THE FOLLOWING DOCUMENTATION IN ADDITION TO THE SCP/DCP FOR CERTAIN MILESTONES
- COST AND OPERATIONAL EFFECTIVENESS ANALYSIS REPORT
- COMMON USE ALTERNATIVE STATEMENT
- PROGRAM BASELINE AGREEMENT
- INDEPENDENT COST ESTIMATE
- MANPOWER ESTIMATE REPORT
FOR ACTION
DISTRIBUTES DOCUMENTATION FOR REVIEW BY THE DAB SUBCOMMITTEES PRIOR TO THE DAB CONVENES DAB
REVIEWS DOCUMENTATION, PROVIDES COMMENTS AND RECOMMENDATIONS TO DAB PRINCIPALS
APPROVES ACQUISITION DECISION MEMORANDUM (ADM) AUTHORIZING PROGRAM TO PROCEED TO THE NEXT ACQUISITION PHASE

F-9 D

Exhibit F-3
ACQUISITION PROCESS OUTLINE
MILESTONE PROCESS FOR
ACAT I AND II PROGRAMS

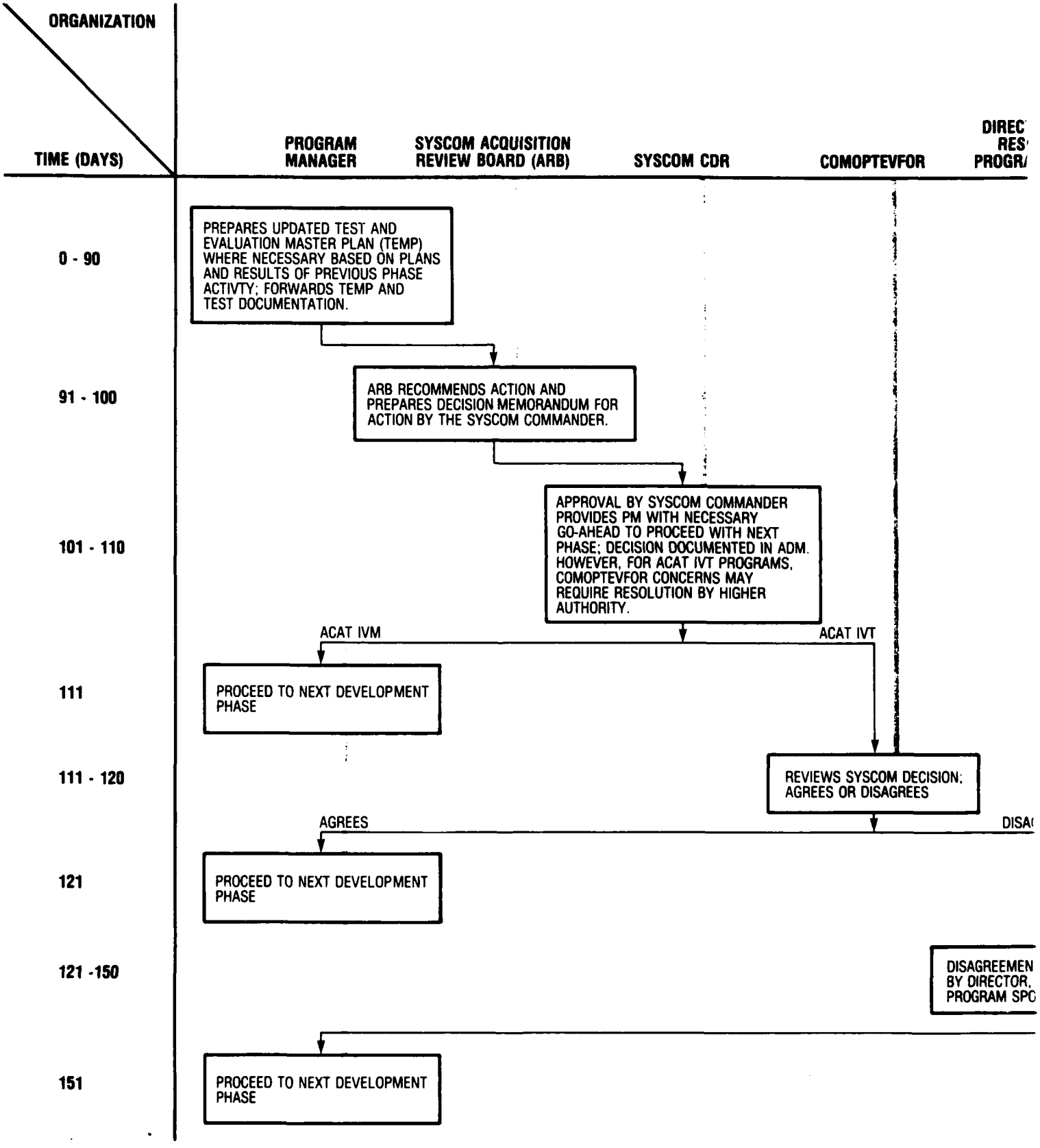

ORGANIZATION
TIME (DAYS)
PROGRAM MANAGER
OPNAV RESOURCE & PROGRAM SPONSOR
DECISION ADVISORS: OP-01, OP-04, OP-07, OP-08 COMOPTEVFOR
DIRECTOR, RDT&E
NAVY PROGRAM DECISION MEETING (NPDM)
0 - 30
31 - 55
56 - 60
61 - 90
91 - 100
101 - 110
111 - 120
121 - 135
136 - 140
141 - 150
151 - 155
156
PREPARES UPDATED TEST AND EVALUATION MASTER PLAN (TEMP) BASED ON PLANS AND RESULTS OF PREVIOUS PHASE ACTIVITIES; FORWARDS TEMP AND TEST DOCUMENTATION TO THE OPNAV RESOURCE SPONSOR AND OTHERS
REVIEW AND COMMENT
REVIEW AND COMMENT
CONSOLIDATES COMMENTS AND ADVISES PROGRAM MANAGER ON REVISION OF DOCUMENTATION
REVISES DOCUMENTATION AS NECESSARY AND FORWARDS TO THE ARB FOR ACTION
MAKES AVAILABLE TO THE DECISION ADVISORS PRIOR TO THE NAVY PROGRAM DECISION MEETING (NPDM), THE TEMP COPIES OF THE PMS AND COMOPTEVFOR'S BRIEFINGS AND THE APPROVAL FOR PRODUCTION ACTION SHEET (IF REQUIRED)
CONDUCTS PRE-NPDM REVIEW AS NECESSARY
CONDUCTS PRE-NPDM REVIEW AS NECESSARY
PRESENTATIONS ARE MADE BY THE PM AND COMOTEVFOR INTENDED DECISION IS ANNOUNCED BY DIRECTOR, RDT&E
DOCUMENTS DECISION IN AN ACQUISITION DECISION MEMORANDUM (ADM); FAVORABLE DECISION ALLOWS PROGRAM TO PROCEED TO NEXT ACQUISITION PHASE, PROMULGATES ADM
COPY FOR INFORMATION AND NECESSARY ACTION
COPY FOR INFORMATION
PROCEEDS TO NEXT DEVELOPMENT PHASE

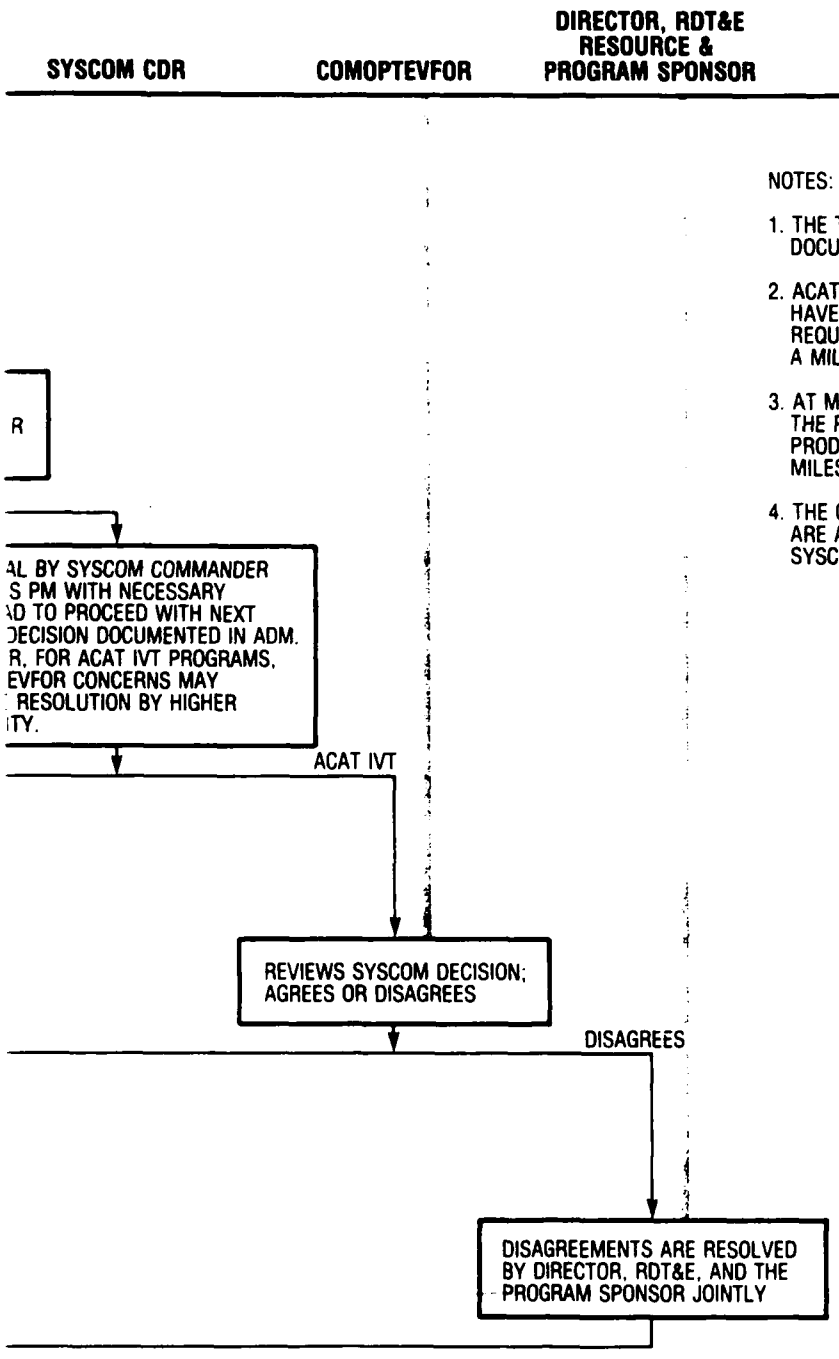


NOTES:

1. THE TEMP IS THE MILESTONE REVIEW DOCUMENT FOR ACAT III AND IV PROGRAMS
2. ACAT III & IV PROGRAMS DO NOT NORMALLY HAVE A MILESTONE I. HOWEVER, A TEMP IS REQUIRED AT THE APPROXIMATE TIME WHEN A MILESTONE I WOULD NORMALLY OCCUR.
3. AT MILESTONE III ALL PROGRAMS REQUIRE THE PREPARATION OF AN APPROVAL FOR PRODUCTION ACTION SHEET FOR THE MILESTONE REVIEW.
4. THE CHAIR AND MEMBERS OF THE ARB ARE APPOINTED FROM AMONG APPROPRIATE SYSCOM OFFICIALS.
5. FOR MARINE CORPS PROGRAMS, SUBSTITUTE MCPDM FOR NPDM.

Exhibit F-4
ACQUISITION PROCESS OUTLINE
MILESTONE PROCESS
FOR ACAT III PROGRAMS


ORGANIZATION
TIME (DAYS)
PROGRAM MANAGER
SYSCOM ACQUISITION REVIEW BOARD (ARB)
SYSCOM CDR
COMOPTEVFOR
DIREC RES PROGR
0 - 90
PREPARES UPDATED TEST AND EVALUATION MASTER PLAN (TEMP) WHERE NECESSARY BASED ON PLANS AND RESULTS OF PREVIOUS PHASE ACTIVTY; FORWARDS TEMP AND TEST DOCUMENTATION.
91 - 100
ARB RECOMMENDS ACTION AND PREPARES DECISION MEMORANDUM FOR ACTION BY THE SYSCOM COMMANDER.
101 - 110
APPROVAL BY SYSCOM COMMANDER PROVIDES PM WITH NECESSARY GO-AHEAD TO PROCEED WITH NEXT PHASE; DECISION DOCUMENTED IN ADM. HOWEVER, FOR ACAT IVT PROGRAMS, COMOPTEVFOR CONCERNS MAY REQUIRE RESOLUTION BY HIGHER AUTHORITY.
ACAT IVM
ACAT IVT
111
PROCEED TO NEXT DEVELOPMENT PHASE
111 - 120
REVIEWS SYSCOM DECISION; AGREES OR DISAGREES
AGREES
DISA
121
PROCEED TO NEXT DEVELOPMENT PHASE
121 -150
DISAGREEMEN BY DIRECTOR, PROGRAM SPO
151
PROCEED TO NEXT DEVELOPMENT PHASE



NOTES:

1. THE TEMP IS THE MILESTONE REVIEW DOCUMENT FOR ACAT III AND IV PROGRAMS.
2. ACAT III & IV PROGRAMS DO NOT NORMALLY HAVE A MILESTONE I. HOWEVER, A TEMP IS REQUIRED AT THE APPROXIMATE TIME WHEN A MILESTONE I NORMALLY OCCURS.
3. AT MILESTONE III ALL PROGRAMS REQUIRE THE PREPARATION OF AN APPROVAL FOR PRODUCTION ACTION SHEET FOR THE MILESTONE REVIEW.
4. THE CHAIR AND MEMBERS OF THE ARB ARE APPOINTED FROM AMONG APPROPRIATE SYSCOM OFFICIALS.

Exhibit F-5
ACQUISITION PROCESS OUTLINE
MILESTONE PROCESS
FOR ACAT IV PROGRAMS

Appendix G
RESEARCH AND DEVELOPMENT LABORATORIES/CENTERS

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APPENDIX G
RESEARCH AND DEVELOPMENT LABORATORIES/CENTERS

The Navy's extensive inhouse laboratory complex provides an important portion of its research and development competence. This complex is woven deeply into the Navy's heritage. For example, the Naval Underwater Systems Center evolved from the Newport Naval Torpedo Station, founded in 1869. The David Taylor Research Center's roots were the Experimental Model Basin (1899) and Engineering Experiment Station (1905). The Naval Research Laboratory, the first Navy Laboratory devoted primarily to basic research in the military sciences, was an outgrowth of recommendations of the Naval Consulting Board of World War I, headed by Thomas A. Edison.

The importance of in-house research and development laboratories in providing technical competence needed by the Government in carrying out its various activities is recognized by the Department of Defense. The DOD laboratories represent a critical and unique resource for solving the scientific and engineering problems, deficiencies, and needs of the military departments. DOD laboratories exist to achieve—in cooperation with universities and industry—a level of technological leadership that will enable the United States to develop, acquire, and maintain military capabilities needed for national security.

DOD Instruction 3201.3; SECNAVINST 3910.3

G1 ROLE OF THE IN-HOUSE RESEARCH AND DEVELOPMENT LABORATORIES/CENTERS

The present complex of the Navy's in-house laboratories employs over 17,000 scientists and engineers. This complex represents an investment of about 1.2 billion dollars in land and buildings and an annual workload of more than 4.4 billion dollars, of which 62% is for RDT&E projects. This complex performs a wide variety of essential tasks ranging from basic research to the support of specialized equipment in the Fleet and field.

The basic purpose of the Navy's in-house laboratories—and of all other Navy RDT&E effort—is to assure that the Nation has the best, most up-to-date, capable, and effective Fleet and Marine Corps forces which modern technology can provide for the resources available.

To fulfill their obligation to the Fleet and further enhance their overall value to the Navy, the laboratories must not only be on-going producers of science and technology, but they must also be thoroughly alert to the present and future operational requirements of the Fleet. To satisfy this requirement, it is mandatory that first, the laboratories understand the operational problems of the Fleet, potential threats, and the capabilities and limitations of its personnel and its organization; and, secondly, the activities be so placed and so used that they have an important voice in systems decisions and planning.

Over the years the Navy has succeeded in building up laboratories of high quality and demonstrable effectiveness. Moreover, the Navy has been fortunate in recruiting and retaining within these laboratories first-rate scientists and engineers who have developed extensive knowledge and understanding of naval problems. In trying out new ideas, laboratory scientists have often joined the operating forces to work side by side with military personnel. Many laboratory projects which have led to improved weapons and operating equipment were inspired and made practical by such close contact with Fleet units.

G2 MANAGEMENT OF NAVY IN-HOUSE R&D LABORATORIES/CENTERS

It is the policy of the Navy to develop and maintain Navy research and development laboratories of acknowledged excellence in those fields of science and technology pertinent to its needs in order to:

- Develop and prosecute scientific and technical laboratory programs having as their prime objective the improvement of Navy and Marine Corps capabilities, equipments, and systems.
- Maintain a sufficient base of scientific and engineering talent, experienced in Navy and Marine Corps matters, to preclude the possibility of "technological surprise" due to unforeseen applications of science and technology by potential enemies.
- Enable the Navy to enter the marketplace in the acquisition of new weapons and weapon systems as sophisticated buyers, with technical experience and expertise in the disciplines relevant to the development of such systems.
- Maintain a technical memory of past technical problems and their solutions to assist in the support of deployed equipment and its improvement while in service.
- Have continuously available the capability to exploit new technical opportunities on a quickreaction basis, often under tight security controls, for the solution of Navy and Marine Corps problems.

ASN(R,E&S) is responsible for all matters related to RDT&E within the DON.

G3 OCNR LABORATORIES

G3.1 Naval Research Laboratory (NRL).

Location: Washington, D.C. 20375-5000
Telephone
Commercial: 202-767-3200
AUTOVON: 297-3200

Mission: To conduct a broadly based multidisciplinary program of scientific research and advanced technological development directed toward new and improved materials, equipment, techniques, systems, and related operational procedures for the Navy.

G3.2 Naval Ocean Research and Development Activity (NORDA).

Location: Bay St. Louis, Mississippi
Stennis Space Center, Mississippi
39529-5004
Telephone
Commercial: 601-688-4010
AUTOVON: 485-4010

Mission: To carry out a broadly based RDT&E program in ocean science and technology, with emphasis on understanding ocean processes through measurement and analysis, and the effects of the ocean environment on Navy systems and operations.

G3.3 Naval Environmental Prediction Research Facility (NEPRF).

Location: Monterey, California
93943-5006
Telephone
Commercial: 408-647-4731
AUTOVON: 878-4731

Mission: To conduct research and development directed towards providing objective local, regional, and global environmental analysis and prediction techniques; and provide planning, modeling, and evaluation services for determining the effect of environmental elements on naval weapon systems.

G4 COMSPAWAR LABORATORIES

G4.1 David Taylor Research Center (DTRC).

Location: Bethesda, Maryland 20084-5000
Annapolis, Maryland 21402-5067

Telephone
Commercial: 202-227-2828
AUTOVON: 287-2828

Mission: To be the principal Navy RDT&E Center for naval vehicles and logistics and for providing RDT&E support to the U.S. Maritime Administration and the maritime industry.

G4.2 Naval Air Development Center (NADC).

Location: Warminster, Pennsylvania 18974-5000
Telephone
Commercial: 215-441-2000
AUTOVON: 441-2000

Mission: To be the principal Navy RDT&E Center for naval aircraft systems, less aircraft-launched weapon systems.

G4.3 Naval Coastal Systems Center (NCSC).

Location: Panama City, Florida 32407-5000
Telephone
Commercial: 904-234-4011
AUTOVON: 436-4011

Mission: To be the principal Navy RDT&E Center for mine and undersea countermeasures, special warfare, amphibious warfare, diving, and other Naval missions that take place primarily in the coastal regions.

G4.4 Naval Ocean Systems Center (NOSC).

Location: San Diego, California 92152-5000
Telephone
Commercial: 619-553-1011
AUTOVON: 553-1011

Mission: To be the principal Navy RDT&E Center for command control, communications, ocean surveillance, surface- and air-launched undersea weapon systems, and submarine arctic warfare.

G4.5 Naval Weapons Center (NWC).

Location: China Lake, California 93555-6001
Telephone
Commercial: 619-939-9011
AUTOVON: 437-9011

Mission: To be the principal Navy research, development, test, and evaluation center for air warfare systems (except antisubmarine warfare systems) and missile weapon systems, and the national range/facility for parachute test and evaluation.

G4.6 Naval Space Systems Activity (NSSA).

Location: PO Box 92960
Worldway Postal Center
Los Angeles, California 90009
Telephone
Commercial: 213-643-1824
AUTOVON: 833-1824

Mission: To provide for the development of assigned space systems. To provide for the interfaces between space systems and other Navy systems. To conduct long range studies and developments for space exploitation. To represent the Director, Navy Space Project and the Commander, Space and Naval Warfare Systems Command to the Commander, Air Force Space Division (SD). To provide management and engineering functions related to joint service space developments. To coordinate with the USAF Space Division on programs of mutual interest

G4.7 Naval Surface Warfare Center (NSWC).

Location: Dahlgren, Virginia 22448-5000
Telephone
Commercial: 703-663-8531
AUTOVON: 249-1110

White Oak, Silver Spring, Maryland 20903-5000
Telephone
Commercial: 202-394-1796
AUTOVON: 290-1796

Mission: To be the principal Navy RDT&E Center for surface ship weapons systems, ordnance, mines, and strategic systems support.

G4.8 Naval Underwater Systems Center (NUSC).

Location: Newport, Rhode Island
02841-5047
New London, Connecticut 06320-5994
Telephone
Commercial: 401-841-4816
AUTOVON: 948-4816

Mission: To be the principal Navy RDT&E Center for submarine warfare and submarine weapon systems.

G5 COMNAVMEDCOM LABORATORIES

G5.1 Naval Medical Research Institute (NMRI).

Location: Naval Medical Command
National Capital Region
Bethesda, Maryland 20814-5055
Telephone
Commercial: 202-295-0021
AUTOVON: 295-0021

Detachments at Dayton, Ohio, and Lima, Peru.

Areas of Responsibility: To conduct basic and applied research and development concerned with the health, safety, and efficiency of naval personnel.

G5.2 Naval Submarine Medical Research Laboratory (NSMRL).

Location: Naval Submarine Base
Groton, Connecticut 06349-5900
Telephone
Commercial: 203-449-3264
AUTOVON: 241-3264

Areas of Responsibility: To conduct medical research and development on problems peculiar to shipboard, submarine, and diving medicine.

G5.3 Naval Medical Research Unit No. 2.

Location: Manila, Republic of the Philippines
Telephone
63-2-732-3776

Detachment in Djakarta, Indonesia
Telephone
41-45-07 (O'Sea Opr)
Mail Add.: APO San Francisco 96528

Areas of Responsibility: To perform medical research on diseases of military importance that are endemic and epidemic in the Far East.

G5.4 Naval Medical Research Unit No. 3.

Location: Cairo, Egypt
Telephone
20-2-820-727
Mail Add.: FPO New York 09527-1600

Areas of Responsibility: To perform medical research on diseases of military importance that are endemic and epidemic in the Middle East.

G5.5 Naval Health Research Center (NHRC).

Location: PO Box 85122
San Diego, California 92138-9174
Telephone
Commercial: 619-553-8400
AUTOVON: 553-8400

Areas of Responsibility: To conduct research and development on the medical and psychological aspects of health and performance of naval service personnel.

G5.6 Naval Dental Research Institute (NDRI).

Location: Naval Base
Great Lakes, Illinois 60088-5259
Telephone
Commercial: 312-688-4678
AUTOVON: 792-4678

Areas of Responsibility: To conduct research, development, test and evaluation on problems of dental and oral health in the Navy and Marine Corps population, and on problems of fleet and field dentistry.

G5.7 Naval Aerospace Medical Research Laboratory (NAMRL).

Location: Naval Air Station
Pensacola, Florida 32508-5600

Telephone
Commercial: 904-452-3286
AUTOVON: 922-3286

Areas of Responsibility: To conduct research and development, test, and evaluation in aerospace medicine and related scientific areas applicable to aerospace systems.

G5.8 Naval Biodynamics Laboratory (NBDL).

Location: PO Box 29407
New Orleans, Louisiana 70189-0407
Telephone
Commercial: 504-257-3917
AUTOVON: 485-2297

Areas of Responsibility: To conduct biomedical research on the effects of the mechanical forces encountered in ships and aircraft on naval personnel, establish human tolerance limits for these forces, and develop methods to protect personnel from such forces.

G6 COMNAVAIR LABORATORIES

G6.1 Naval Air Engineering Center (NAEC).

Location: Lakehurst, New Jersey
08733-5000
Telephone
Commercial: 201-323-2011
AUTOVON: 624-1110

Mission: To conduct programs of research, engineering, development, test and evaluation, systems integration, limited production, procurement, and fleet engineering support in: aircraft launching, recovery, and landing aid systems, and ground support equipment for aircraft and for airborne weapon systems. To provide, operate. and maintain test sites, facilities, and support services for tests of the above systems and equipment and to conduct research and development of equipment and instrumentation used in tests. To support the DOD standardization and specification program. To provide services and material and to operate and maintain aviation and other facilities in support of assigned programs and for other activities and units as designated by appropriate authority.

G6.2 Naval Air Propulsion Center (NAPC).

Location: PO Box 7176
Trenton, New Jersey 08628-0176
Telephone
Commercial: 609-896-5600
AUTOVON: 443-7011

Mission: To provide complete technical and engineering support for air breathing propulsion systems, including their accessories and components, and fuels and lubricants, to the Naval Air Systems Command and the Fleet by: managing and performing applied research and development leading to new propulsion systems; participating in the development and evaluation of new propulsion systems; conducting propulsion system tests and evaluation as necessary to ensure successful mission accomplishment and assisting in the the determination of corrective action necessary for the resolution of operational Service problems; and to perform such other functions and tasks as directed by the Commander, Naval Air Systems Command.

G6.3 Naval Training Systems Center (NTSC).

Location: Orlando, Florida 32813-7100
Telephone
Commercial: 407-380-4000
AUTOVON: 960-4000

Mission: To be the principal Navy center for RDT&E, acquisition, and logistics support of training systems, and to provide inter-service coordination and training systems support for the Army and Air Force.

G6.4 Naval Air Test Center (NATC). (See H6.3)

G6.5 Pacific Missile Test Center (PMTC). (See H6.4)

G6.6 Naval Weapons Evaluation Facility (NWEF). (See H6.5)

G7 COMNAVFAC LABORATORY

G7.1 Naval Civil Engineering Laboratory (NCEL).

Location: Port Hueneme, California 93043-5003
Telephone
Commercial: 805-982-4528
AUTOVON: 360-4528

Mission: To be the principal Navy RDT&E Center for shore and fixed-surface and subsurface ocean facilities and for the Navy and Marine Corps construction forces.

G8 COMNAVSEA LABORATORIES

G8.1 Naval Explosive Ordnance Disposal Technology Center (NEODTC).

Location: Indian Head, Maryland 20640-5070
Telephone
Commercial: 301-743-4225/4330
AUTOVON: 364-4225/4330

Mission: To conduct RDT&E in technical matters concerning the detection, location, rendering safe, and disposal of conventional and special weapons, guided missiles, underwater ordnance, improvised devices, and biological and chemical munitions, both U.S. and foreign, and provide the tools, equipment, and techniques required to discharge the Navy's single Manager responsibility to DOD and other agencies as directed by the Secretary of the Navy.

G8.2 Naval Ordnance Missile Test Station (NOMTS). (See H7.1)

G9 COMNAVSUP LABORATORY

G9.1 Navy Clothing and Textile Research Facility (NCTRF).

Location: 21 Strathmore Road
Natick, Massachusetts 01760-2490
Telephone
Commercial: 617-651-4172
AUTOVON: 256-4172

Mission: To conduct RDT&E and provide engineering support in clothing, textiles, and related fields associated with service clothing and environmental protective clothing.

G10 COMNAVMILPERSCOM LABORATORY

G10.1 Navy Personnel Research and Development Center (NPRDC).

Location: San Diego, California 92152-6800
Telephone
Commercial: 619-553-7897
AUTOVON: 553-7897

Mission: To be the principal research and development center for the Department of the Navy's planning and utilization of manpower and personnel and to pursue a coordinated technical development program in the areas of education and training.

G11 NOT-FOR-PROFIT ACTIVITIES SUPPORTING NAVAL R&D

G11.1 Marine Physical Laboratory, Scripps Institution of Oceanography.

Location: San Diego, California 92152
Telephone
Commercial: 619-225-7259
AUTOVON: 933-7259

Contractor: Scripps Institution of Oceanography, University of California.

Mission: To generate knowledge about the ocean and its boundaries and application of this knowledge to the solution of Navy undersea problems.

G11.2 Applied Research Laboratory, Pennsylvania State University.

Location: PO Box 30
State College, Pennsylvania 16801
Telephone
Commercial: 814-865-6343

Contractor: Applied Research Laboratory, Pennsylvania State University.

Mission: To (1) serve as the lead laboratory for research in the guidance and control of undersea weapons, (2) provide corporate memory and technical expertise in the area of advanced closed-cycle thermal propulsion systems for undersea weapons, and (3) provide expertise in the area of propulsion technology, hydrodynamics, and hydroacoustics for undersea vehicles and weapons.

G11.3 Applied Research Laboratories, The University of Texas at Austin.

Location: PO Box 8029, Austin, Texas 78712
Telephone
Commercial: 512-835-3200

Contractor: Applied Research Laboratories, The University of Texas at Austin.

Mission: To (1) contribute to fundamental scientific advances in acoustics and electromagnetics; (2) help with exploitation of relevant research results, and (3) conduct RDT&E and field support for solution of Navy wartime problems in acoustics and electromagnetics for surface, subsurface, and space environments.

G11.4 Applied Physics Laboratory, The University of Washington.

Location: 1013 N.E. 40th St.
Seattle, Washington 98105
Telephone
Commercial: 206-543-1310

Contractor: Applied Physics Laboratory, The University of Washington.

Mission: To conduct a university-based program of fundamental research, technology advancement, and engineering support emphasizing naval applications of ocean science, ocean acoustics, and engineering.

G11.5 Applied Physics Laboratory, Johns Hopkins University.

Location: Johns Hopkins Road
Laurel, Maryland 20707
Telephone
Commercial: 301-953-5000
FTS: 920-3370

Mission: To provide essential engineering, research, development, and test and evaluation capabilities in support of programs to improve the efficiency and assure the availability of current and future Navy strategic and tactical forces; and to conduct related scientific and technical programs on behalf of other military and civilian agencies of the government.

G11.6 Systems Research Center, Virginia Polytechnic Institute and State University.

Location: Blacksburg, Virginia 24061
Telephone
Commercial: 703-961-6144

Mission: To conduct research and development for computing support systems of interest to the Navy and to other government agencies.

G11.7 Center for Naval Analyses (CNA).

Location: 4401 Ford Avenue, Alexandria, Virginia 22302-0268
Telephone
Commercial: 703-824-2000
AUTOVON: 289-2638

Contractor: Hudson Institute

Mission: To conduct a continuing program of research, studies, and investigations which will provide information needed for DON management decisions addressing the development and application of naval capabilities, help the operating forces of the DON in improving their effectiveness, and develop operational data for use in force planning and force evaluation studies.

SELECTED REFERENCES ON RESEARCH AND DEVELOPMENT LABORATORIES/CENTERS

DOD Directive 3201.1, "Management of DOD Research and Development Laboratories," establishes policy and guidance for the management of DOD research and development (R&D) laboratories, assigns responsibilities for the management of DOD laboratories, and establishes the DOD Laboratory Management Task Force (LMTF).

DOD Directive3201.3, "DOD Research and Development Laboratories," amplifies long-term goals and objectives of DOD research and development (R&D) laboratories.

SECNAV Instruction 3910.3, "Navy Research and Development Laboratories," states policy and guidance and assigns responsibilities for the management of Navy research and development (R&D) laboratories.

NAVCOMPT Instruction 7044.5, "DOD In-House RDT&E Annual Activities Report," instructions for preparation of report.

RDT&E Center Management Briefs, three volumes containing information on the missions, facilities, programs, major accomplishments, organization, personnel, funds, and functions/ responsibilities of each of the 20-plus DON RDT&E organizations covered. (Published annually by COMSPAWARSYSCOM). Copies may be obtained by sending a request to

Commander, Space and Naval Warfare
Systems Command (SPAWAR 005)
Washington, DC 20363-5100

Department of Defense In-house RDT&E Activities. A compendium of information on DOD RDT&E field activities issued annually by the Office of the Director of Research and Laboratory Management on the staff of the Deputy Under Secretary of Defense for Research and Advanced Technology. In addition to the missions, it provides data on finances, manpower, facilities and major programs for all designated DOD RDT&E field activities. Copies may be obtained by sending a request to

Director, Research and Laboratory
Management
Office of DUSD(R&AT)
Rm. 3E114 Pentagon
Washington, DC 20301

or

Director for Research and Technology
Department of the Army
Rm. 3E474 Pentagon
Washington, DC 20310

NOTE REGARDING DIRECTIVE NUMBERS

References to directives within this Guide are by series only; e.g., 3900.14, not to the effective edition within the series; e.g., 3900.14A.

The "Master Reference List" shows the version and issue data of each directive used in preparation of this edition of the Guide.

For recent information on the effective directive within a series, consult NAVPUBNOTE 5215, "Department of the Navy Directives Issuance System: Consolidated Subject Index."

Appendix H
TEST AND EVALUATION

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Appendix H
TEST AND EVALUATION

This appendix provides information amplifying Chapter 7, "Test and Evaluation."

H1 CONGRESSIONAL INTEREST IN TEST AND EVALUATION

The importance of test and evaluation in the eyes of Congress is reflected in the following passages from Chapter 4, Title 10, United States Code:

Section 139 was originally included in the authorization act for FY 1972. Section 136(a) first appeared in the FY 1984 act.

> **139. Secretary of Defense: weapons development and procurement schedules for armed forces; reports; supplemental reports**
>
> (a) The Secretary of Defense shall submit to Congress each calendar year ... a written report regarding development and procurement schedules for each weapon system for which ... funds for procurement are requested in that budget. The report shall include data on operational testing and evaluation ...
>
> (b) The Secretary of Defense shall submit a supplemental report to Congress not less than thirty, or more than sixty, days before the award of any contract, or the exercise of any option in a contract, for the procurement of any such weapon system ...
>
> **136a. Director of Operational Test and Evaluation; appointment; powers and duties.**
>
> (a) (1) There is a Director of Operational Test and Evaluation in the Department of Defense, appointed ... by the President, by and with the advice and consent of the Senate ...
>
> .....
>
> (d) The Director reports directly, without intervening review or approval, to the Secretary of Defense ....
>
> (e) (1) The Secretary of a military department shall report promptly to the Director the results of all operational test and evaluation conducted by the military department and all studies conducted by the military department in connection with operational test and evaluation in the military department.
>
> .....
>
> (f) (2) A final decision within the Department of Defense to proceed with a major defense acquisition program ... may not be made until the Director has submitted to the Secretary of Defense the report with respect to the program required by subsection (b)(5) and the Committees on Armed Services and on Appropriations of the Senate and House of Representatives have received that report.

H2 T&E RESPONSIBILITIES OF OFFICIALS

H2.1 Deputy Director, Test and Evaluation (DDT&E). The DDT&E serves as staff assistant to the USD(A) for T&E matters within the DOD. General responsibilities include:

- Responsibility and authority for all DT&E conducted within DOD, including designating RDT&E programs as major for the purpose of DT&E oversight
- Serving as OSD focal point for review, coordination, and approval for each system's TEMP. The DOT&E and the DDT&E are the approval authorities for all major systems acquisition program TEMPs
- Review of new major defense acquisition program requirements, documents, system concept papers, decision coordinating papers, and integrated program summaries for DT&E implications, resource requirements, and for providing comments to the DAE and the DAB principals
- Monitoring and reviewing RDT&E to ensure adherence to approved policy, guidance, and standards

- Designating such observed to be present during any DT&E activities as may be required to assess test conduct or test results
- Providing, at each formal review of a system under development, the DAE and the DAB principals with a detailed assessment of T&E conducted by the DOD Components
- Providing advice and making recommendations to the Secretary of Defense and issuing guidance to and consulting with the heads of DOD Components with respect to DT&E
- Administrative processing of nominations of tests for the joint test program as defined in the joint test procedures manual. At the time of joint test approval, the DOT&E or the DDT&E, as appropriate, assumes responsibility for management and oversight
- Oversight of the Major Range and Test Facility Base (MRTFB), as defined in DOD Directive 3200.11, as well as the development of all test resources, including aerial targets and threat simulator systems
- Administration of the Foreign Weapons Evaluation Program as outlined in DOD 5000.3-M-2
- Maintaining a DOD Test and Evaluation Master Library and Data Base
- Confirming, with advice from the ATSD(AE), that nuclear survivability and hardness objectives are achieved during DT&E
- Serving as the OSD focal point for review, coordination, and approval of Live Fire Test and Evaluation (LFT&E) policy.

DODDIR 5000.3

H2.2 Director of Operational Test and Evaluation (DOT&E). The DOT&E is the principal advisor and staff assistant to SECDEF on OT&E. His responsibilities include:

- Prescribing policies, procedures, and standards for OT&E
- Providing guidance for conduct of OT&E in general and specific OT&E for major systems
- Monitoring and reviewing OT&E to ensure adherence to approved policies and standards
- Coordinating JOT&E programs with special emphasis on obtaining information pertinent to operational doctrine, tactics, and procedures
- Taking actions to ensure that OT&E for major programs properly evaluates the operational effectiveness and suitability of systems
- Reviewing and making recommendations to SECDEF on all budgetary and financial matters relating to OT&E including facilities and equipment
- Reviewing and reporting to SECDEF on the adequacy of OT&E planning, priorities, support resources, execution, evaluation, and reporting for major programs.

DODDIR 5141.2

H2.3 Director, R&DR,T&E (OP-098). The Director, R&DR,T&E (OP-098) is responsible for implementing the responsibilities of the CNO with respect to the Navy RDT&E Program insofar as T&E-related functions are concerned. He is aided in implementation of these responsibilities by the Test and Evaluation Division (OP-983).

OPNAVINST 5430.48, OPNAV Organizational Manual

H2.3.1 Test and Evaluation Division (OP-983). The Test and Evaluation Division implements the responsibilities of the Director, R&DR,T&E with respect to cognizance over planning, conduct, and reporting of all air, surface, and undersea/strategic test and evaluation. The Division:

- Acts as the sole OPNAV point of contact with the DDT&E and forwards to the DDT&E all appropriate Navy T&E documents and information
- Acts as Navy point of contact for all multi-service T&E
- Reviews operational requirements and development proposals to ensure adequate provision for T&E facilities/ resources will be made
- Reviews Decision Coordinating Papers, and changes thereto for adequacy and accuracy; and exercises Navy policy and control over T&E sections thereof
- Reviews Test and Evaluation Master Plans (TEMPs) to ensure compliance with T&E policies
- Reviews TEMPs to ensure proper planning for resources required for T&E of new weapon systems, including requirements for new or improved range capabilities and targets
- Exercises for the Director, R&DR,T&E sponsorship over all range matters including acting as program sponsor for the Navy elements of the Major Range and Test Facility Base
- Schedules all RDT&E fleet support.

H3 T&E ACTIVITIES REPORTING TO CNO

H3.1 Board of Inspection and Survey.

OPNAVINST 5420.70

H3.1.1 General responsibilities. The responsibilities of the Board of Inspection and Survey are set forth in Chapter 3, U.S. Navy Regulations, 1973. The following article cover the Board's T&E responsibilities:

> 0321. President, Board of Inspection and Survey.
>
> The President of the Board of Inspection and Survey, assisted by such other officers and such permanent and semipermanent subboards as may be designated by the Secretary of the Navy, shall:
>
> a. Conduct acceptance trials and inspections of all ships and service craft prior to acceptance for naval service.
>
> b. Conduct acceptance trials and inspections on one or more aircraft of each type or model prior to final acceptance for naval service.
>
> c. Examine at least once every three years, if practicable, each naval ship to determine its material condition and, if found unfit for continued service, report to higher authority.
>
> d. Perform such other inspections and trials of naval ships, service craft, and aircraft as may be directed by the Chief of Naval Operations.

H3.1.2 Organization. The work of the Board of Inspection and Survey is accomplished through several permanent and semipermanent groups: BIS, Washington, D.C.; Sub-BIS Aviation Board Atlantic, Norfolk, Virginia; Sub-BIS Pacific, San Diego, California; Sub-BIS Aviation Board, Patuxent River, Maryland; and semipermanent Boards at inactive ship maintenance facilities, naval districts, and various overseas locations. In addition, other sub-Boards may be convened as required by the President.

H3.2 Operational Test and Evaluation Force (OPTEVFOR).

OPNAVINST 5440.47

H3.2.1 Missions and tasks.

Mission: It is the mission of OPTEVFOR to operationally test and evaluate specific weapon systems, ships, aircraft, and equipments, including procedures and tactics, where required; and, when directed by CNO, assist development agencies in the accomplishment of necessary development test and evaluation.

Tasks:

1. Carry out assigned responsibilities as an independent test agency for required operational test and evaluation under the command of CNO and serve as principal advisor to the CNO for all Department of the Navy matters pertaining to operational test and evaluation.

2. Provide the results of operational test and evaluation to the Defense Acquisition Board (DAB) production decision review(s) and to other reviews as directed by CNO.

3. Conduct operational tests on weapon systems including ships and aircraft.

4. Evaluate the operational effectiveness, suitability, and capability of tested weapon systems to meet the stated needs and performance criteria, reporting the results to CNO.

5. Develop tactics and procedures for the employment of specific weapon systems as directed by the CNO.

6. Assist the various development agencies in the conduct of developmental test and evaluation including the coordination, scheduling, and conduct of Fleet services. Report results of such assists, including assessment of operational suitability and ability to meet specified needs, to the development agency and CNO.

7. Review the T&E planning for new weapon systems, reporting to the CNO on the adequacy of the plan to address and resolve critical issues.

8. Monitor and report on such other tests and evaluation efforts as are directed by the CNO.

H3.2.2 OPTEVFOR organization. The Operational Test and Evaluation Force, with headquarters at Norfolk, Virginia, is a fleet force under:

- The Chief of Naval Operations for technical control and program guidance in the field of development, test, and evaluation.
- The Commander in Chief U.S. Atlantic Fleet for administrative support.
- CINCLANTFLT/CINCPACFLT for all operational matters under the purview of CINCLANT/CINCPAC.

At the Headquarters, the OPTEVFOR staff is organized along the lines which give primary consideration to types of warfare and to project administration rather than along the lines of a standard Navy staff. Under this type of organization, evaluation of equipments or systems is carried out within staff divisions manned by personnel with experience peculiar to the type of warfare for which their division is named.

For Pacific area operations, a separate staff under Deputy COMOPTEVFORPAC is located at the Naval Air Station, North Island, San Diego, California. The qualifications of personnel assigned to this staff division are such as to permit supervision of all types of projects assigned to Commander Operational Test and Evaluation Force for prosecution in the Pacific Fleet area. The function of the Deputy COMOPTEVFORPAC is to act as the representative of the Force Commander for OPTEVFOR matters in the Pacific Fleet and, when directed, with West Coast agencies. In that capacity he maintains liaison with

the Commander in Chief, U.S. Pacific Fleet; Pacific Fleet type, functional, and support commanders; and, when directed, heads of Pacific shore activities engaged in developmental work, including civilian contractors. He exercises staff cognizance as directed over OPTEVFOR projects being prosecuted in the Pacific Fleet area in that he administers, coordinates, supervises, or prosecutes projects, and prepares proposed project plans and reports as required. When requested by CINCPACFLT he renders assistance for Pacific Fleet assist projects. Ships assigned to the Deputy Commander for operational control remain under the administrative control of their type commander or district commandant.

H3.2.3 OPTEVFOR subordinate commands. The Operational Test and Evaluation Force comprises the following subordinate commands:

H3.2.3.1 Air Test and Evaluation Squadron One (VX-1).

Location: Naval Air Station
Patuxent River, Maryland 20670
Telephone
Commercial: 301-863-3607
AUTOVON: 356-3607

The function of Air Test and Evaluation Squadron One, located at NATC, Patuxent River, Maryland, is to test and/or evaluate airborne antisubmarine weapon systems, support systems, components, and equipment, and to develop tactics for their use. Tests are conducted using land and carrier-based, fixed and rotary-wing aircraft.

H3.2.3.2. Air Test and Evaluation Squadron Four (VX- 4).

Location: Point Mugu, California 93042
Telephone
Commercial: 809-982-7518
AUTOVON: 351-7518

The function of Air Test and Evaluation Squadron Four, located at Point Mugu, California, is to test and/or evaluate all-weather fighter weapon systems and air-launched guided missile weapon systems including associated equipment and aircraft, as directed by Commander, Operational Test and Evaluation Force. Tests and evaluations are carried out with aircraft assigned to the squadron for that purpose and with the assistance of Pacific Fleet units assigned by the Commander in Chief, U.S. Pacific Fleet, when required for specific projects. The squadron works in close cooperation with the Pacific Missile Test Center, Point Mugu. (See H6.4.)

H3.2.3.3. Air Test and Evaluation Squadron Five (VX- 5).

Location: Naval Weapons Center
China Lake, California 93555
Telephone
Commercial: 714-939-5274
AUTOVON: 437-5274

The function of Air Test and Evaluation Squadron Five is to develop airborne attack weapon systems and support systems and to evaluate aircraft tactics, techniques, and procedures for the delivery of airborne special weapons. This evaluation is carried out by operational tests with aircraft assigned to the squadron for that purpose and with the assistance of Pacific Fleet units assigned by Commander in Chief, U.S. Pacific Fleet, when required for specific projects. The squadron works in close cooperation with the Naval Weapons Center at China Lake.

H3.2.3.4 OPTEVFOR Detachment, Sunnyvale, CA.

Location: Naval Air Station
Moffet Field, California 94034
Telephone
Commercial: 406-742-4155
AUTOVON: 359-3110, ext. 24155

The function of OPTEVFOR Detachment Sunnyvale is to pursue projects primarily in the field of command, control, communications, and intelligence as assigned by COMOPTEVFOR.

H3.3 Atlantic Fleet Weapons Training Facility.

Location: Roosevelt Roads, Puerto Rico
Mail: FPO Miami, Florida 34051
Tel: Comm. (809) 863-2000

Detachments:

Three-Dimensional Underwater Range
St. Croix, Virgin Islands

Drone Control Site
Roosevelt Roads, Puerto Rico

Drone Control Site
St. Thomas, Virgin Islands

Drone Control Site
St. Croix, Virgin Islands

Air Impact and Close Air Support Range
Vieques Island

Mission: To operate, maintain, and develop weapons range facilities and services in direct support of the training of fleet forces and other activities and for the development, test, and evaluation of weapon systems.

H4 T&E ACTIVITIES REPORTING TO COMMANDANT MARINE CORPS

H4.1 Marine Corps Research, Development, and Acquisition Command (MCRDAC).

Location: Quantico, Virginia 22134
Telephone
Commercial: 703-640-2411
AUTOVON: 278-2411

Mission: The CG, MCRDAC is responsible to ensure that all Development Test and Evaluation (DT&E) and designated operational testing of Marine Corps systems is effectively planned, conducted, and reported and to provide assistance to the Marine Corps Operational Test and Evaluation Activity (MCOTEA).

H4.2 Marine Corps Operational Testing and Evaluation Activity (MCOTEA).

Location: Quantico, Virginia
Telephone
Commercial: 703-640-3141
AUTOVON: 278-3141

Mission: To support the material acquisition process by managing the Marine Corps OT&E program, to include planning and management responsibility for all OT&E, to conduct operational testing of all major systems and designated nonmajor systems, and to perform such other functions as may be directed by the Commandant of the Marine Corps.

MCO 3960.2

H5 T&E CAPABILITIES OF IN-HOUSE LABORATORIES AND RANGES

All the in-house laboratories and centers have some T&E capabilities as related to their mission. (See Appendix G for information on the in-house laboratories and centers.) The following three ranges encompass major air, ground, or sea areas and are major elements of the Navy T&E base.

H5.1 Atlantic Undersea Test and Evaluation Center (AUTEC).

Parent Laboratory: Naval Underwater Systems Center (G4.8)

Location: West Palm Beach, Florida and Andros Island, Bahamas

Mission: To provide a deep water test and evaluation facility for making underwater acoustic measurements; testing and calibrating sonars; and providing accurate underwater, surface, and in-air tracking data on ships, submarines, aircraft, and weapon systems in support of the Navy anti-submarine warfare and undersea research and development programs and of antisubmarine warfare fleet assessment and operational readiness.

H5.2 Naval Weapons Center Ranges.

Parent Laboratory: Naval Weapons Center (G4.5)

Location: China Lake, California

Mission: To conduct test and evaluation of air warfare systems (except antisubmarine warfare systems) and missile weapon systems.

H5.3 Naval Surface Weapons Center Ranges.

Parent Laboratory: Naval Surface Weapons Center (G4.7)

Location: Dahlgren, Virginia

Mission: To test Navy guns and mounts. The range testing may be subdivided into two broad categories: (1) proof and acceptance testing, the object of which is to assure the quality, performance, safety, and reliability of ordnance for the Fleet; and (2) developmental testing, the objective of which is to provide an experimental basis for new and improved weapons and systems.

H6 T&E FIELD ACTIVITIES REPORTING TO COMMANDER, NAVAL AIR SYSTEMS COMMAND

H6.1 Naval Air Engineering Center.

Location: Lakehurst, New Jersey 08733
Telephone
Commercial: 201-323-1110
AUTOVON: 624-1110

Mission: To conduct programs of research, engineering, development, test and evaluation, systems integration, limited production, procurement, integrated logistic support, and fleet engineering support in: aircraft launching, recovery, and landing aid systems, and support equipment for aircraft and for airborne weapon systems. To provide, operate, and maintain test sites, facilities, and support services for tests of the above systems and equipment and to conduct research and development of equipment and instrumentation used in tests. To provide systems engineering support services and to support DOD standardization and specification programs. To provide services and material and to operate and maintain aviation and other facilities in support of assigned programs and for other activities and units as designated by appropriate authority.

H6.2 Naval Air Propulsion Center.

Location: PO Box 7176
Trenton, New Jersey 08628
Telephone
Commercial: 609-896-5600
AUTOVON: 443-7011

Mission: To provide complete technical and engineering support for air-breathing propulsion systems, including their accessories and components and fuels and lubricants, to the Naval Air Systems Command and the Fleet by: managing and performing applied research and development leading to new propulsion systems; participating in the development and evaluation of new propulsion systems; conducting propulsion system tests and evaluation as necessary to ensure successful mission accomplishment and assisting in the determination of corrective action necessary for the resolution of operational Service problems; and to perform such other functions and tasks as directed by the Commander, Naval Air Systems Command.

H6.3 Naval Air Test Center (NATC).

Location: Patuxent River, Maryland 20670
Telephone
Commercial: 301-863-3000
AUTOVON: 356-0111

Mission: To be the Navy's principal aircraft weapons system test and evaluation activity through active test and evaluation participation in all phases of the weapons system life cycle process including support of technology demonstration and development; full-scale development (FSD); production support and fleet support; and fleet

in-service engineering support. This includes providing a principal site for development test and evaluation during FSD as assigned and providing, as directed, range technical, engineering, and/or base support for Navy users and other DOD and government agencies.

H6.4 Pacific Missile Test Center (PMTC).

Location: Point Mugu, California 93042
Telephone
Commercial: 805-982-7851
AUTOVON: 351-1110

Mission: To perform development test and evaluation, development support, and follow-on engineering, logistics, and training support for naval weapon, weapons systems, and related devices; provide major range, technical, and base support for Fleet users and other DOD and Government agencies.

H6.5 Naval Weapons Evaluation Facility.

Location: Kirtland AFB
Albuquerque, New Mexico 87117
Telephone
Commercial: 505-844-0011
AUTOVON: 244-0011

Mission: To perform tests, evaluations, and provide technical support for nuclear and designated nonnuclear weapons and weapon systems; maintain direct liaison with all levels of command within the Navy and other Government agencies with respect to nuclear weapon safety; advise and assist the Chief of Naval Operations in promoting and monitoring nuclear weapon safety and the prevention of nuclear weapon accidents or incidents; plan and conduct nuclear weapon system safety studies and reviews; plan and coordinate the Navy Nuclear Weapons Safety Program; and assist in the trials of naval aircraft as requested by the Board of Inspection and Survey.

H7 T&E FIELD ACTIVITY REPORTING TO COMMANDER, NAVAL SEA SYSTEMS COMMAND

H7.1 Naval Ordnance Missile Test Station.

Location: White Sands
Missile Range, New Mexico 88002
Telephone
Commercial: 505-678-2101
AUTOVON: 258-2101

Mission: To conduct and support assigned Navy Guided missile, rocket, gun, and directed energy programs, including ground and flight testing; to participate in the operation of the DOD missile test range at White Sands; and to perform additional tasks as directed by COMNAVSEASYSCOM.

SELECTED REFERENCES ON TEST AND EVALUATION

DODDIR 3200.11, "Major Range and Test Facility Base," delineates policies and responsibilities for management and operation of the MRTFB.

OPNAVINST 3960.10, "Test and Evaluation," sets forth policies and procedures for test and evaluation.

Appendix J
GLOSSARY

The following terms were selected from directives and other official documents.

Most of these definitions came originally from directives which bore a disclaimer along these lines: "As used in this directive, the following definitions will apply." Thus these definitions are presented with the following words of caution:

> WARNING: The following definitions are presented for information only. It cannot be assumed that directive and manual writers using these terms in any particular instance are attempting to convey the precise meanings contained in these definitions.

Abbreviations and acronyms are listed inside the front and back covers.

ACCEPTANCE TRIALS—Trials and material inspection conducted underway by the trial board for ships constructed in a private shipyard to determine suitability for acceptance of a ship.

ACCRUED EXPENDITURES—Costs incurred during a given period representing liabilities incurred for goods and services received, other assets acquired, and performance accepted, whether or not payment has been made.

ACQUISITION—The process consisting of planning, designing, producing, and distributing a weapon systems/equipments. Acquisition in this sense includes the conceptual, validation, full-scale development, production, and deployment/ operational phases of the weapon systems/ equipments project. For those weapon systems/ equipments not being procured by a project manager, it encompasses the entire process from inception of the requirement through the operational phase.

ACQUISITION CATEGORY (ACAT)—One of four acquisition categories established by CNO which govern acquisition procedures and responsibilities and assign respective decision authority levels.

ACQUISITION DECISION MEMORANDUM (ADM)—A memorandum signed by the Secretary of Defense, the Secretary of the Navy, the NAE, or designated PDA that documents decisions regarding an acquisition program.

ACQUISITION RISK—The chance that some element of an acquisition program produces an unintended result with adverse effect on system effectiveness, suitability, cost, or availability for deployment.

ACQUISITION STREAMLINING—Any action that results in more efficient and effective use of resources to develop, produce, and deploy quality defense systems and products. This includes ensuring that only cost-effective requirements are included, at the most appropriate time, in system and equipment solicitations and contracts.

ADVANCED DEVELOPMENT (Budget Category 6.3)—Includes all projects which have moved into the development of hardware for test.

AGENCY COMPONENT—A major organizational subdivision of an agency. For example: the Army, Navy, Air Force, and Defense Supply Agency are agency components of the Department of Defense. The Federal Aviation, Urban Mass Transportation, and the Federal Highway Administrations are agency components of the Department of Transportation.

AGENCY MISSIONS—Those responsibilities for meeting national needs assigned to a specific agency.

ALLOCATION—An authorization by a designated official of a component of the Department of Defense making funds available within a prescribed amount to an operating agency for the purpose of making allotments; i.e., the first subdivision of an apportionment.

ANALYSIS—The qualitative and/or quantified evaluation of information requiring technical knowledge and judgment.

APPORTIONMENT—A determination by the Office of Management and Budget as to the amount of obligations which may be incurred when the nature of the work involved prevents the preparation of definitive requirements, specifications, or cost data. Sometimes called letter of intent.

APPROPRIATION SPONSOR—DCNO or a Director of a Major Staff Office charged with supervisory control over an appropriation.

AUTHORIZATION—Basic substantive legislation enacted by Congress which sets up a Federal program or agency either indefinitely or for a given period of time. Such legislation sometimes sets limits on the amount that can subsequently be appropriated, but does not usually provide budget authority.

AUTOMATIC TEST EQUIPMENT (ATE)—An equipment that is designed to automatically conduct analysis of functional or static parameters and to evaluate the degree of performance degradation and perform fault isolation of unit malfunctions.

AVAILABILITY—A measure of the degree to which an item is in an operable and commitable state at the start of a mission when the mission is called for at an unknown (random) time.

BASELINE, APPROVED—The combination of approved program schedule, configuration, performance characteristics, acquisition, strategy, and other business aspects which constitute the variables reflected in either the appropriate acquisition milestone approval for that acquisition category or as reflected in the latest approved program management proposal action.

BENEFIT-COST ANALYSIS—An analytical approach to solving problems of choice. It requires the definition of objectives, identification of alternative ways of achieving each objective, and the identification, for each objective, of that alternative which yields the required level of benefits at the lowest cost. This same analytical process is often referred to as cost-effectiveness analysis when the benefits or outputs of the alternatives cannot be quantified in terms of dollars.

BUDGET—A planned program for a fiscal period in terms of (a) estimated costs, obligations and expenditures, (b) source of funds for financing, including reimbursements anticipated and other resources to be applied, and (c) explanatory and workload data on the projected programs and activities.

BUDGET AUTHORITY—Authority provided by the Congress, mainly in the form of appropriations, which allows Federal agencies to incur obligations to spend or lend money. (Budget in Brief)

BUDGETING—The process of translating approved resource requirements (Manpower & Material) into timephased financial requirements.

BUDGET MARK-UP—Revision of a budget in detail, at a review level, based on consideration of policies, programs, scheduling, cost factors, and other pertinent data, as a basis for approval or obligation authorization.

BUDGET YEAR—That fiscal year arrived at by adding one to the current fiscal year.

CHART, FLOW—A graphic presentation using symbols to show the step-by-step sequence of operations or procedures.

CHOP—Expression indicating concurrence.

COMBAT SYSTEM—The equipment, computer programs, people and documentation organic to the accomplishment of the mission of an aircraft, surface ship, or submarine; excludes the structure, material,

propulsion, power and auxiliary equipment, transmissions and propulsion, fuels and control systems, and silencing inherent in the construction and operation of aircraft, surface ships and submarines.

COMBAT SYSTEM TEST INSTALLATION—A collection of subsystems including weapon, sensor, and information processing equipment together with their interfaces installed, for the purposes of early testing prior to the availability of a first production item, at a test facility designed to simulate the essential parts of the production item.

COMMITMENT—A firm administrative reservation of funds, based upon firm procurement directives, orders, requisitions, authorizations to issue travel orders, or requests which authorize the recipient to create obligations without further recourse to the official responsible for certifying the availability of funds.

CONFIGURATION MANAGEMENT—A discipline applying technical and administrative direction and surveillance to (1) identify and document the functional and physical characteristics of a configuration item, (2) control changes to those characteristics, and (3) record and report change processing and implementation status.

CONTRACT—An agreement, enforceable by law, between two or more competent parties, to do or not to do something not prohibited by law, for a legal consideration.

CONTRACT, COST—A contract which provides for payment to the contractor of allowable costs, to the extent prescribed in the contract, incurred in performance of the contract.

CONTRACT, COST-PLUS-A-FIXED-FEE—A cost-reimbursement-type contract which provides for the payment of a fixed fee to the contractor. The fixed fee, once negotiated, does not vary with actual cost, but may be adjusted as a result of any subsequent changes in the scope of work or services to be performed under the contract.

CONTRACT, COST-PLUS-INCENTIVE-FEE—A cost-reimbursement-type contract with provision for a fee which is adjusted by formula in accordance with the relationship which total allowable costs bear to target costs. The provision for increase or decrease in the fee, depending upon allowable costs of contract performance, is designed as an incentive to the contractor to increase the efficiency of performance.

CONTRACT, COST-REIMBURSEMENT TYPE—A type of contract which provides for payment to the contractor of allowable costs incurred in the performance of the contract, to the extent prescribed in the contract.

CONTRACT, COST-SHARING—A cost-reimbursement-type contract under which the contractor receives no fee but is reimbursed only for an agreed portion of its allowable costs.

CONTRACT, FIRM-FIXED-PRICE—A contract which provides for a price which is not subject to any adjustment by reason of the cost experience of the contractor in the performance of the contract.

CONTRACT, FIXED-PRICE—A type of contract which generally provides for a firm price, or under appropriate circumstances may provide for an adjustable price, for the supplies or services which are being procured.

CONTRACT, FIXED-PRICE WITH ESCALATION—A fixed-price type of contract which provides for the upward and downward revision of the stated contract price upon the occurrence of certain contingencies (such as fluctuations in the material prices and labor rates) which are specifically defined in the contract.

CONTRACT, LETTER—A written preliminary contractual instrument which authorizes immediate commencement of manufacture of supplies, or performance of services, including preproduction planning and the procurement of necessary materials. It is used when negotiation of a definite contract in sufficient time to meet the procurement need is not possible, as, for example, when the nature of the work involved prevents the preparation of definitive

requirements, specifications, or cost data. Sometimes called letter of intent.

CONTRACT, TASK-TYPE—A master contract for research and development work, consisting of two parts, one of which sets forth general provisions and the other which is represented by one or more task orders issued thereunder.

CONTRACTOR SUPPORT—An arrangement during initial development or production of end-items whereby a contractor furnishes required material and maintenance of an end-item or system pending assumption of supply support by the military service.

CONTROL—The act of evaluating, through the use of reports or records or by inspection of operations, current performance of assigned responsibilities as compared with planned objectives or established standards.

COST ANALYSIS—An analytical process employed to predict the resource requirements for weapon systems and programs.

COST ANALYSIS IMPROVEMENT GROUP (CAIG)—The principal advisory group to the DAB on matters related to costs.

COST CATEGORY—One of three types of costs into which the total cost of a program element is divided: (1) research and development, (2) investment, and (3) operating.

COST CENTER—An administrative unit selected for the purpose of accumulating and controlling costs. It usually: (1) consists of a natural grouping of machines, methods, processes, or operations; (2) is identified with single management responsibility; and (3) is made up of elements which have common cost characteristics.

COST/EFFECTIVENESS ANALYSIS—A method of examining alternative means of accomplishing a desired military objective/mission for the purpose of selecting weapons and forces which will provide the greatest military effectiveness for the cost.

COST GROWTH—A term related to the net change of an estimated or actual amount over a base figure previously established. The base must be relatable to a program, project or contract and be clearly identified including source, approval authority, specific items included, specific assumptions made, date and the amount.

COST MODELS—A method for making rapid estimates of dollar and manpower requirements to support force structure which are accurate enough to detect significant differences in the cost-effectiveness of alternatives. This is done by using an assembled set of Navy program factors and a computerized set of estimating relationships to compute statistical averages.

CRITICAL INTELLIGENCE PARAMETERS—Threat parameters, such as numbers, types, mix, or characteristics of projected enemy systems, that are most critical to the effectiveness of a U.S. weapon system.

CRITICAL ISSUES—Those aspects of a system's capability, either operational, technical, or other, that must be questioned before a system's overall worth can be estimated, and that are of primary importance to the decision authority in reaching a decision to allow the system to advance into the next acquisition phase.

CURRENT ESTIMATE (CE)—(See C2.1)

DATA—Any representations such as characters or analog quantities to which meaning may be assigned. Data may be expressed in digital, graphic, or symbolic form.

DATA SYSTEM—Combinations of personnel efforts, forms, formats, instructions, procedures, data elements and related data codes, communications facilities, and automatic data processing equipment, which provide an organized and interconnected means, either automated, manual, or a mixture of these for recording, collecting, processing and communicating data.

DEFENSE ACQUISITION EXECUTIVE (DAE)—The principal advisor to the Secretary of Defense on

all matters pertaining to the Department of Defense Acquisition System. The Under Secretary of Defense for Acquisition (USD(A)) is the DAE and the Defense Procurement Executive.

DEFENSE RESEARCH—Scientific study and experimentation directed toward increasing knowledge and understanding in those fields of the physical, engineering, environmental, biological-medical, and behaviorial-social sciences directly related to explicitly-stated long-term national security needs.

DEMONSTRATION AND VALIDATION DECISION—Milestone I decision by which the SECDEF reaffirms the mission need and approves one or more selected alternatives for competitive demonstration and validation.

DEPARTMENT OF DEFENSE ACQUISITION SYSTEM—A single uniform system whereby all equipment, facilities, and services are planned, designed, developed, acquired, maintained, and disposed of within the Department of Defense. The system entails establishing policies and practices that govern acquisitions, determining and prioritizing resource requirements, directing and controlling the process, contracting, and reporting to Congress.

DEPARTMENT OF THE NAVY FIVE-YEAR PROGRAM (DNFYP)—The Navy's official programming document. This publication consists of volumes or booklets and displays the Navy's portion of the FiveYear Defense Program (FYDP). SECDEF-approved forces, manpower, and financial data are given for each Navy Program Element for the current, budget and program years.

DESIGN TO COST (DTC)—An acquisition management technique to achieve defense system designs that meet stated cost requirements. Cost is addressed on a continuing basis as part of a system's development and production process. The technique embodies early establishment of realistic but rigorous cost objectives, goals, and thresholds and a determined effort to achieve them.

DETERMINATIONS AND FINDINGS (D&F)—Documents (signed by (1) the Secretary of a Department, (2) the Head of a Procuring Activity, or (3) the Contracting Officer) that justify the use of the authority to enter into contracts by negotiation.

DEVELOPING AGENCY (DA)—The Systems Command or designated program manager assigned responsibility for the development, test and evaluation of a weapon system, subsystem or item of equipment.

DEVELOPMENT ESTIMATE (DE)—(See C2.1)

DEVELOPMENT TEST AND EVALUATION (DT&E)—That test and evaluation conducted to assist the engineering design and development process and to verify attainment of technical performance specifications and objectives.

DISCOUNT RATE—The interest rate used to discount or calculate future costs and benefits so as to arrive at their present values.

DISTRIBUTION STATEMENT—A statement used in marking a technical document to denote the conditions of its availability for distribution, release, or disclosure at the initiation of a component of the DOD.

DOCUMENT—Any recorded information or data regardless of physical form or characteristics, including but not limited to the following:

(1) Written or printed material: (whether handwritten, printed or typed);

(2) Data processing cards or tapes;

(3) Maps, charts, photographs, negatives, moving or still films, or film strips;

(4) Paintings, drawings, engravings, or sketches;

(5) Sound or voice recordings;

(6) Reproductions of the foregoing by any means or process.

DOD COMPONENTS—The Office of the Secretary of Defense (OSD); the Military Departments; the

Organization of the Joint Chiefs of Staff (OJCS); the Unified and Specified Commands; the Office of the Inspector General, Department of Defense (OIG, DOD); Defense Agencies; and DOD Field Activities.

ECONOMIC ANALYSIS—A systematic approach to the problem of choosing how to employ scarce resources and an investigation of the full implications of achieving a given objective in the most efficient and effective manner.

EFFECTIVENESS—The performance or output received from an approach or a program. Ideally, it is a quantitative measure which can be used to evaluate the level of performance in relation to some standard, set of criteria, or end objective.

ENGINEERING CHANGE—An alteration in the physical or functional characteristics of a system or item delivered, to be delivered, or under development, after establishment of such characteristics.

ENGINEERING DEVELOPMENT (Budget Category 6.4)—Includes those projects in full-scale development for Service use but which have not yet received approval for production or had production funds included in the DOD budget submission for the budget or subsequent fiscal year.

EXPENDITURES—Charges against available funds. They are evidenced by vouchers, claims, or other documents approved by competent authority. Expenditures represent the actual payment of funds.

EXPENSES—Costs of resources consumed in use.

FIVE-YEAR DEFENSE PROGRAM—The official document which summarizes the SECDEF-approved plans and programs for the Department of Defense. It is published at least once annually.

FOLLOW-ON OPERATIONAL TEST AND EVALUATION (FOT&E)—All OT&E after the Production and Deployment Decision.

INFORMATION ANALYSIS CENTER—A DOD-wide service directed toward collecting technical information in a specific area of effort and its evaluation and filtering into the form of condensed data, summaries or state-of-the-art reports.

INFORMATION RETRIEVAL SYSTEM—A system for locating and selecting, on demand, certain documents or other graphic records relevant to a given information requirement from a file of such material. Examples of information retrieval systems are classification, indexing, and machine searching systems.

INFORMATION SYSTEM—The network of all communication methods within an organization. It includes information exchanges upward, downward, or laterally to accomplish the objectives of the organization as well as information fed back to be used in management appraisal, progressing, controlling, scheduling, planning and also in replanning, rescheduling and other phases, to assure the appropriate end result.

INITIAL OPERATIONAL TEST AND EVALUATION (IOT&E)—All OT&E prior to the Production and Deployment Decision.

INTEGRATED LOGISTICS SUPPORT (ILS)—A disciplined, unified, and iterative approach to the management and technical activities necessary to:

a. Integrate support considerations into system and equipment design.

b. Develop support requirements that are related consistently to readiness objectives, to design, and to each other.

c. Acquire the required support.

d. Provide the required support during the operational phase at minimum cost.

INTEROPERABILITY—The ability of systems, units, or forces to provide services to, and accept services from, other systems, units or forces, and to use the services so exchanged to enable them to operate together effectively.

INVESTMENT COSTS—Costs of real property and equipment.

LABORATORY—A government-operated installation at which an important fraction of the work is research and development.

LAND-BASED TEST SITE (LBTS)—A facility duplicating/simulating as many conditions as possible of a system's planned operational installation and utilization.

LEAD-TIME, PROCUREMENT—The time interval between the initiation of procurement action and the receipt into the supply system of material purchased as a result of such action.

LEAD-TIME, PRODUCTION—The time interval between the placement of a contract and receipt into the supply system of material acquired.

LIFE-CYCLE COST—The total cost to the Government for the development, acquisition, operation and logistic support of a system or set of forces over a defined life span.

LIFE CYCLE COSTING—Life Cycle Costing (LCC) is an acquisition or procurement technique which considers operating, maintenance, and other costs of ownership as well as acquisition price in the award of contracts for hardware and related support.

LOGISTICS SUPPORT—The supply and maintenance of material essential to proper operation of a system in the force.

LOGISTICS SUPPORTABILITY—The degree to which the planned logistics (including test equipment, spares and repair parts, technical data, support facities, and training) and manpower meet system availability and wartime usage requirements.

LOW RATE INITIAL PRODUCTION (LRIP)—The production of a system in limited quantity to be used in OT&E for verification of production engineering and design maturity and to establish a production base.

MAINTAINABILITY—A characteristic of design and installation which is expressed as the probability that an item will be retained in or restored to a specified condition within a given period of time, when the maintenance is performed following prescribed procedures and resources.

MAINTENANCE ENGINEERING—That activity of equipment maintenance which develops concepts, criteria and technical requirements during the conceptual and acquisition phases to be applied and maintained in a current status during the operational phase to assure timely, adequate and economic maintenance support of weapons and equipments.

MAJOR DEFENSE ACQUISITION PROGRAMS—Are acquisition programs which are expected to exceed $200 million in Research, Development, Test and Evaluation (RDT&E) or $1 billion in procurement costs (Fiscal Year 1980 constant dollars) or are designated major by the Secretary of Defense because or urgency of need, development risk, joint funding, significant Congressional interest, or other considerations. Major defense acquisition programs are designated either a Defense Acquisition Board (DAB) or Component program.

MAJOR RANGE AND TEST FACILITY BASE (MRTFB)—The complex of major DOD ranges and test facilities.

MANAGEMENT AND SUPPORT (Budget Category 6.5)—Includes research and development effort directed toward support of installations or operations required for general research and development use.

MANUFACTURING TECHNOLOGY—Any action undertaken which has as its objective (1) the timely establishment or improvement of the manufacturing processes, techniques, or equipment required to support current and projected programs, and (2) the assurance of the ability to produce, reduce leadtime, insure economic availability of end items, reduce costs, increase efficiency, improve reliability, or to enhance safety and antipollution measures.

METROLOGY—The science of weights and measures used to determine conformance to technical requirements including the development of standards and systems for absolute and relative measurements.

MILITARY INTER-DEPARTMENTAL PURCHASE REQUEST (MIPR)—A procurement order issued by one Military Service on another Military Service to procure, produce or deliver services, supplies or equipment to or for the ordering Service.

MISSION AREA—A major subdivision of a mission, so extracted that it generally parallels the traditional naval warfare and support areas.

MISSION AREA—A segment of the Defense mission as established by the SECDEF.

MISSION-ESSENTIAL WEAPON SYSTEM (MEWS)—A system, subsystem, or component that performs a combat mission or is essential to a mission capability. This includes combat-mission-essential personnel, command, control, and communication, electronic warfare, and hull mechanical and electrical systems, as well as weapons and weapon systems. A platform with associated systems is also defined as a weapon system.

MISSION NEED—A required capability within an agency's overall purpose, including cost and schedule considerations.

NAVAL VEHICLES—Self-propelled, boosted, or towed conveyances used for the strategic and tactical deployment of forces, weapons, materials, and supplies in support of naval warfare.

NAVY (DON) ACQUISITION EXECUTIVE (NAE)—The principal advisor to the Secretary of Navy and the Under Secretary of Defense (Acquisition) on all matters pertaining to the DOD Acquisition System. The Under Secretary of the Navy is the NAE for the DON.

NAVY (DON) ACQUISITION SYSTEM—A single uniform system whereby all equipment, facilities, and services are planned, designed, developed, acquired, maintained, and disposed of within the DON. The DON system entails establishing policies and practices that govern acquisitions, determining and prioritizing resource requirements, directing and controlling the process, contracting, and reporting to the Office of the Secretary of Defense (OSD) and to the Congress.

NEW OBLIGATIONAL AUTHORITY (NOA)—Authority becoming newly available for a given year, provided by current and prior actions of the Congress, enabling Federal Agencies to obligate the government to pay out money.

NON-DEVELOPMENT ITEM (NDI)—Already developed and available hardware and/or software capable of fulfilling Department of the Navy requirements, thereby minimizing or eliminating the need for costly, time-consuming Government-sponsored R&D programs. NDI is usually off-the-shelf or commercial-type products, but may also include equipment already developed by or for the Department of the Navy, other military services, or foreign military forces.

OBLIGATION—The amount of an order placed, contract awarded, service received, or other transaction which legally reserves a specified amount of an appropriation or fund for expenditure.

OPERABILITY—The design characteristic of the system/equipment that will assure personnel feasibility and optimum utilization of operator personnel.

OPERATING BUDGET, APPROVED—An authorization to an R&D field activity on NAVCOMPT Form 2189-1 (Approved Operating Budget) that constitutes authority to that activity for incurring obligations within the amount authorized for each direct program R&D effort assigned therein.

OPERATIONAL AVAILABILITY (Ao)—An index of a weapon system *material readiness*, including system software where applicable, in a *mission* environment. It is a measure of the probability of an item's being in a condition, generally referred to as "up", such that it can perform its intended function, within acceptable limits of degradation, when called upon.

OPERATIONAL CAPABILITY—A subdivision of a mission area which more specifically delineates appropriate operational functions.

OPERATIONAL EFFECTIVENESS—The overall degree of mission accomplishment of a system when used by representative personnel in the environment planned or expected for operational employment of the system considering organization, doctrine, tactics, survivability, vulnerability, and threat (including countermeasures, nuclear, and chemical and/or biological threats).

OPERATIONAL REQUIREMENTS—User or user-representative generated validated needs developed to address mission area deficiencies, evolving threats, emerging technologies or weapon system cost improvements. Operational requirements form the foundation for weapon system unique specifications and contract requirements.

OPERATIONAL SUITABILITY—The degree to which a system can be placed satisfactorily in field or fleet use with consideration given to operational availability (A_o), compatibility, transportability inter-operability, reliability, wartime usage rates, maintainability, testability, safety, human factors, manpower supportability, logistics supportability, documentation, training requirements, and atmosphere/ocean climate.

OPERATIONAL SYSTEMS DEVELOPMENT—Includes these projects still in full-scale development but which have received approval for production through JRMB or other action, or production funds have been included in the DOD budget submission for the budget or subsequent fiscal year.

OPERATIONAL TEST AND EVALUATION (OT&E)—The field test under realistic combat conditions, of any item (or key component of) weapons, equipment, or munitions for the purpose if determining the effectiveness and suitability of the weapons, equipment, or munitions for use in combat by typical military users; and the evaluation of the results of such test.

OUTLAYS—Expenditures or the actual amount of funds that must be drawn from the Treasury for goods and services received during the fiscal year under review.

PARAMETRIC COST ESTIMATE—An estimate which predicts costs by means of explanatory variables such as performance characteristics, physical characteristics, and characteristics relevant to the development process. as derived from experience on logically related systems. (Report of Commission on Government Procurement).

PILOT PRODUCTION—The controlled manufacture of limited numbers of an item for service test and evaluation purposes using manufacturing drawings and specifications which have been developed for quantity production and with tooling that is representative of that to be used in unlimited production.

PLANNING ESTIMATE (PE)—(See C2.1)

PLANNING / PROGRAMMING / BUDGETING SYSTEM (PPBS)—An integrated system for the establishment, maintenance, and revision of the FYDP and the DOD budget.

PREPRODUCTION PROTOTYPE—An article in final form employing standard parts, representative of articles to be produced subsequently in a production line.

PROCUREMENT—Includes purchasing, renting, leasing, or otherwise obtaining supplies or services. It also includes all functions that pertain to the obtaining of supplies and services, including description but not determination of requirements, selection and solicitation of sources, preparation and award of contracts, and all phases of contract administration.

PRODUCIBILITY—The degree to which articles can be replicated, given the considerations of manufacturing techniques, availability of materials and labor, and total costs.

PRODUCTION ACCEPTANCE TEST AND EVALUATION (PAT&E)—Test and evaluation of production items to demonstrate that the items procured fulfill the requirements and specifications of the procuring contract or agreements.

PRODUCTION AND DEPLOYMENT DECISION—The Milestone III decision by which the

SECDEF reaffirms the mission need, confirms the system as ready for production, approves the system for production, and authorizes the Component to deploy the system to the using activity.

PRODUCTION ESTIMATE (PE)—(See C2.1)

PROGRAM (Acquisition version)—A plan or scheme of action designed for the accomplishment of a definite objective which is specific as to the time-phasing of the work to be done and the means proposed for its accomplishment, particularly in quantitative terms, with respect to manpower, material, and facilities requirements.

PROGRAM (PPBS version)—A combination of program elements designed to express the accomplishment of a definite objective or plan which is specified as to the time-phasing of what is to be done and the means proposed for its accomplishment. Programs are aggregations of program elements and, in turn, aggregate to the total fiveyear defense program.

PROGRAM ACQUISITION COST (PAC)—The development, procurement, and system specific construction cost to acquire the defense system.

PROGRAM BASELINE—A formal agreement between a PM and a PEO, SAE, or the DAE that briefly summarizes factors critical to the success of a program, such as functional specifications, cost, and schedule objectives and requirements, against which the program will subsequently be evaluated.

PROGRAM/BUDGET DECISION (PBD)—A Secretary of Defense decision, in prescribed format, authorizing changes to a submitted budget estimate and the FYDP.

PROGRAM CHANGE DECISION (PCD)—A Secretary of Defense decision, in prescribed format, authorizing changes to the Five-Year Defense Program.

PROGRAM CHANGE REQUEST (PCR)—Proposal, in prescribed format, for out-of-cycle changes to the approved data in the Five-Year Defense Program.

PROGRAM DECISION MEMORANDUM (PDM)—A document which provides decisions of the Secretary of Defense on POMs.

PROGRAM DEFINITION—Is the description of a program's concept, purpose, schedule and resource requirements, and is a mandatory precursor to th allocation of RDT&E resource 'rogram definition is contained in program documentation [Operational Requirement (OR), Required Operational Capability (ROC), Marine Corps Justification System New Start (JSNS), Decision Coordinating Paper (DCP), Test and Evaluation Master Plan (TEMP)].

PROGRAM ELEMENT—The basic building block of the Five-Year Defense Program, the program element is a description of a mission by the identification of the organizational entities and resources needed to perform the assigned mission. Resources consist of forces, manpower, material quantities, and costs, as applicable.

PROGRAM EVALUATION—Economic analysis of on-going actions to determine how best to improve approved program/project based on actual performance. Program evaluation studies entail a comparison of actual performance with the approved program/project.

PROGRAM EXECUTIVE OFFICERS (PEO)—Officials responsible for administering a defined number of major and/or non-major acquisition programs who report to and receive direction from an SAE.

PROGRAM MANAGEMENT—Management of a project, using organizational or procedural alignments, which will permit varying degrees of intensified direction. This may apply to management of a complete system or any portion thereof, and it may include all phases of development, production, and distribution, or be limited to a single phase, e.g., development.

PROGRAM MANAGER (PM)—The individual in the DOD to manage manage a major system acquisition program.

PROGRAM MANAGER CHARTER—A document approved by the appropriate authority stating the

program manager's responsibility, authority, and accountability in the management of a major system acquisition project.

PROGRAMMING (DOD PROGRAMMING SYSTEM)—The process of translating planned military force requirements into time-phased manpower and material resource requirements.

PROJECTED OPERATIONAL ENVIRONMENT (POE)—Statement of projected conditions of operations of each class of naval unit used in establishment of manning requirements. The POE statement includes wartime and peacetime operating conditions as well as other information pertinent to developing the Ship Manning Document (SMD).

PROJECT ORDER—A specific, definite and certain order issued under the authority contained in 41 U.S.C. 23 for the manufacture of materials, supplies, and equipment, or for other work or services which, when placed with and accepted by a separately managed and financed Government-owned and operated establishment, serves to obligate appropriations in the same manner as orders or contracts placed with commercial enterprises.

PROVISIONING, INITIAL—The process of determining the range and quantity of items (i.e., spares and repair parts, special tools, test equipment and support equipment) required to support and maintain an end item of material for an initial period of service.

PROVISIONING, PHASED—A management refinement to the provisioning process whereby procurement of all or part of the total computed quantity of selected items is deferred until the later stages of production, thereby enhancing the ability of the provisioning activity to predict requirements more reliably.

QUALITY ASSURANCE—A planned and systematic pattern of all actions necessary to provide adequate confidence that material conforms to established technical requirements and achieves satisfactory performance in service.

R&D RESPONSIBILITY CENTER—A designated organizational element or a major subdivision thereof such as a laboratory, an operating division, or a service center at an R&D installation for which overall responsibility for specified operations has been assigned to one individual and for which a separate budget has been established.

RAPID DEVELOPMENT CAPABILITY FOR WARFARE SYSTEMS (RDC)—The ability to react immediately to newly discovered enemy threats through special administrative procedures to expedite all or any portion of the development, test, evaluation and subsequent procurement/ production of either modifications to existing warfare systems/components or new warfare systems/components.

RDT&E PROGRAM—Consists of all efforts funded from the RDT&E appropriation regardless of program category or program element.

REIMBURSABLE ORDER—An order for work or services accepted by a government office/activity which is initially financed by the performing activity. All cost incurred will result in reimbursement to the performing appropriation.

RELIABILITY—The probability that a system, subsystem or component, or part will perform its intended function, for a specified period of time, under stated conditions.

REPROGRAMMING / REPROGRAMMING ACTIONS—Changes in the application of financial resources from the purposes originally contemplated and budgeted for, testified to, and described in the justification submitted to the Congressional Committees in support of fund authorizations and budget requests.

REQUIRED OPERATIONAL CAPABILITY (ROC)—A brief statement of a specific operational capability which is required in the midrange period.

REQUIRED OPERATIONAL CAPABILITIES STATEMENT (ROC)—A composite listing of all required operational capabilities for a class of ship or types of aircraft squadrons as assigned by the Chief of Naval Operations. A ROC, together with a statement

of Projected Operational Environment (POE), provides the necessary detail and criteria to establish manning requirements.

RESEARCH (Budget Category 6.1)—Includes all effort of scientific study and experimentation directed toward (1) increasing knowledge and understanding in those fields of the physical, engineering, environmental and life sciences related to long-term national security needs. It provides fundamental knowledge required for the solution of military problems. It forms a part of the base for (a) subsequent exploratory and advanced developments in Defense-related technologies, and (b) new and improved military functional capabilities in areas such as communications, detection, tracking, surveillance, propulsion, mobility, guidance and control, navigation, energy conversion, materials and structures, and personnel support.

SCIENTIFIC AND TECHNICAL INFORMATION (STI)—Communicable knowledge or information resulting from or pertaining to the conduct and management of R&E efforts. STI is used by administrators, managers, scientists, and engineers engaged in scientific and technological efforts and is the basic intellectual resource for and result of such effort.

SELECTED ACQUISITION REPORT (SAR)—A report prepared for the SECDEF which summarizes current estimates of technical, schedule, and cost performance in comparison with the original plans and current program.

SHOULD-COST STUDY—A comprehensive, in-depth, management analysis, which involves examination and evaluation of all phases of a contractor's operation, done by a team of specialists in engineering, pricing, audit, management, and plant facilities, etc. The primary objective is to identify instances of omission or commission in the management and performance of planned or existing work which could compromise attainment of realistic schedule, performance, and cost objectives. A realistic price is one which is based on an attainable cost estimate; that is, an estimate of what it should cost if the contractor operates with reasonable economy and efficiency.

SOURCE SELECTION—The process wherein the requirements, facts, recommendations, and government policy relevant to an award decision in a competitive procurement of a system/project are examined and the decision is made.

SPECIFICATION—A document intended primarily for use in procurement, which clearly and accurately describes the essential technical requirements by which it will be determined that the requirements have been met. Specifications for items and materials may also contain preservation, packaging, packing, and marking requirements.

STANDARD—An established or accepted rule, measure, or model by which the degree of satisfactoriness of a product or act is determined.

STANDARDIZATION—The process of establishing by common agreement engineering criteria, terms, principles, practices, materials, items, processes, equipment, parts, subassemblies, and assemblies to achieve the greatest practicable uniformity of items of supply and engineering practices, to insure the minimum feasible variety of such items and practices, and to effect optimum interchangeability of equipment parts and components.

STUDIES AND ANALYSES—Critical examination and investigation of a subject, often requiring sophisticated analytical techniques to integrate a variety of factors, leading to conclusions or recommendations making substantive contribu- tions to planning, programming and decision making. Unlike experimentally-oriented research and development activities, studies and analyses are typically "pencil and paper" efforts (often computer-assisted) which usually do not generate new scientific knowledge *per se*. Studies are designed to organize and evaluate data and information already available (or which can be inferred or extrapolated from existing data) to provide greater understanding or relevant alternative policies, systems or programs.

SUNK COST—A cost which is irrevocably committed to a project; such costs have no bearing on the results of comparative cost studies.

SUPPORTABILITY—The degree to which system design characteristics and planned logistics resources, including manpower, meet system peacetime readiness and wartime utilization requirements.

SURVIVABILITY—The degree to which a system is able to avoid or withstand a hostile environment without suffering an abortive impairment of its ability to accomplish its designated mission.

SYSTEM—An assembly of procedures, processes, methods, routines, or techniques united by some form of regulated interaction to form an organized whole.

SYSTEM ACQUISITION PROCESS—A sequence of specified decision events and phases of activity directed to achievement of established program objectives in the acquisition of Defense systems and extending from approval of a mission need through successful deployment of the Defense system or termination of the program.

SYSTEM DESIGN CONCEPT—An idea expressed in terms of general performance, capabilities, and characteristics of hardware and software oriented either to operate or to be operated as an integrated whole in meeting a mission need.

SYSTEM EFFECTIVENESS—A measure of the extent to which a system can be expected to complete its assigned mission within an established timeframe under stated environmental conditions.

SYSTEM ENGINEERING, DEFENSE—That portion of the acquisition process dealing with the transformation of an operational need into an optimal set of system performance parameters and a preferred system configuration. It includes engineering/technical management, definition of system and program, design engineering, support engineering, the integration of the engineering specialties, and other such factors that affect the development, production, deployment, operation, and disposal of the system.

SYSTEM ENGINEERING PROCESS—A logical sequence of activities and decisions transforming an operational need into a description of system performance parameters and a preferred system configuration.

SYSTEM READINESS OBJECTIVE—A criterion for assessing the ability of a system to undertake and sustain a specified set of missions at planned peacetime and wartime utilization rates. System readiness measures take explicit account of the effects of system design, R&M, the characteristics and performance of the support system, and the quantity and location of support resources. Examples of system readiness measures are combat sortie rate over time, peacetime mission capable rate, operational availability, and asset ready rate.

TAILORING—The process of evaluating individual potential requirements to determine their pertinence and cost effectiveness for a specific system or equipment acquisition, and modifying these requirements to ensure that each contributes to an optimal balance between need and cost.

TECHNICAL DATA—Recorded information, regardless of form or characteristic, of a scientific or technical nature. It may, for example, document research, experimental, developmental, or engineering work; or be usable or used to define a design or process or to procure, produce, support, maintain, or operate material. The data may be graphic or pictorial delineations in media such as drawings or photographs; in test specifications, related performance or design-type documents; in machine forms such as punched cards, magnetic tape, computer memory printouts; or may be retained in computer memory.

TECHNICAL EVALUATION—The final subphase of Development Test and Evaluation II (DT-II), the purpose of which is to certify that the design meets specified requirements and is ready for Operational Evaluation (OPEVAL).

TECHNICAL SERVICES—Those services associated with the installation, operation, and maintenance of aircraft and shipboard weapons, equipment and

systems and performed by in-house and contract personnel qualified and trained in engineering and technical disciplines.

TECHNOLOGICAL LIFE—The estimated number of years before technology will make the existing or proposed equipment or facilities obsolete.

TEST CRITERIA—Standards by which test results and outcome are judged.

THREAT—The sum of the potential strength, capabilities, and intentions of an enemy which can limit or negate mission accomplishment or reduce force, system, or equipment effectiveness.

THRESHOLDS—Monetary, time, or resource limitations placed on a program, to be used as guides as the program progresses and the breaching of which is cause for careful review of at least some aspects of the program.

THRESHOLDS (DOD PROGRAMMING SYSTEM)—A set of criteria which, if met or exceeded, requires the submission of a Program Change Request to the Office of the Secretary of Defense.

TOP LEVEL REQUIREMENTS (TLR)—A document promulgated and approved by the CNO which defines the operational requirements of a ship to be produced and stipulates the maximum cost and all other program constraints affecting the design and utilization of the ship. As a minimum the TLR will state the ship's mission, operational requirements, major configuration constraints, plan for use, maintenance concepts, supply support concepts, manning limitations, minimum operational standards and maximum allowable cost.

TOP LEVEL SPECIFICATIONS (TLS)—A document promulgated by the Naval Sea Systems Command which translates the Top Level Requirements into a physical ship description thus providing a bridge between the Top Level Requirements and the ship procurement specifications.

TOTAL OBLIGATIONAL AUTHORITY (TOA)—The total financial requirements of the Five-Year Defense Program or any component thereof required to support the approved program of a given fiscal year.

TRANSPORTABILITY—The capability of material to be moved by towing, self-propulsion, or carrier through any means, such as railways, highways, waterways, pipelines, ocean, and airways. (Full consideration of available and projected transportation assets, mobility plans and schedules, and the impact of system equipment and support items on the strategic mobility of operating military forces is required to achieve this capability.)

UNDERWAY TRIALS (UT)—Trials and material inspection conducted underway by the Trial Board for all ships constructed in a naval shipyard or converted/modernized in a naval or private shipyard to determine suitability for delivery and whether the ship is ready for active fleet duty.

UNSOLICITED PROPOSAL—A research or development proposal which is made to the Government by a prospective contractor without prior formal or informal solicitation from a purchasing activity.

VALUE ENGINEERING DISCIPLINE—A sequential process for systematically analyzing the functional requirements of DOD systems, equipment, facilities, procedures, and material to achieve the essential functions at the lowest total cost of effective ownership, consistent with requirements for performance, reliability, quality, maintainability, and safety.

VULNERABILITY—The characteristics of a system which causes it to suffer a definite degradation as a result of having been subjected to a certain level of effects in a man-made hostile environment.

WEAPONRY—The wherewithal to defeat naval and military targets by destructive or nondestructive means.

WORK BREAKDOWN STRUCTURE—A product-oriented family tree division of hardware, software, services and other work tasks which organizes, defines and graphically displays the product to be produced as well as the work to be accomplished to achieve the specified product.

WORK UNIT—The smallest segment into which research or technology efforts are divided for local administration or control. Each work unit has a specific objective, finite duration, and results in an end product. It is technically distinct in scope, objective, and duration from other research or technology efforts with which it may be aggregated for either financial, administrative, or contracting purposes.

GLOSSARY REFERENCE LIST

DODINST 5000.8, "Glossary of Terms Used in the Areas of Financial, Supply and Installations Management." The Glossary contains approximately 1,200 terms "for general-reference use."

JCS Pub. 1, *Department of Defense Dictionary of Military and Associated Terms,* June 1979.

NOTE REGARDING DIRECTIVE NUMBERS

References to directives within this Guide are by series only; e.g., 3900.14, not to the effective edition within the series; e.g., 3900.14A.

The Master Reference List shows the version and issue date of each directive used in preparation of this edition of the Guide.

Appendix K
MASTER REFERENCE LIST

This master reference list provides a consolidated listing of directives and instructions, showing modifications and date of issue, used in preparation of this edition of the **DON RDA Management Guide.** Numbers in parentheses following the citation show specific sections and paragraphs affected by that directive.

DOD

DODDIR 3200.11 of 9/29/80 (OPNAV 3900.25), MAJOR RANGE AND TEST FACILITY BASE. (7.3.2; 7.3.3; 7.3.5; H)

DODDIR 3200.12 of 2/15/83 (SECNAV 3900.43), DOD SCIENTIFIC AND TECHNICAL INFORMATION PROGRAM (STIP). (1.5.3; D; D1; D3)

DODMAN 3200.12-M-1 of 8/84, RESEARCH AND TECHNOLOGY WORK UNIT INFORMATION SYSTEM DATA INPUT MANUAL. (C10, D3.1.1)

DODREG 3200.12-R-1 of 8/83, RESEARCH AND TECHNOLOGY WORK UNIT INFORMATION SYSTEM REGULATION. (6.7.7.1; D; D3.1.1)

DODREG 3200.12-R-2 of 1/85, CENTERS FOR ANALYSIS OF SCIENTIFIC AND TECHNICAL INFORMATION REGULATION. (D; D4)

DODDIR 3201.1 of 3/9/81 (SECNAV 3910.3), MANAGEMENT OF DOD RESEARCH AND DEVELOPMENT LABORATORIES. (G)

DODINST 3201.3 of 3/31/81 (SECNAV 3910.3), DOD RESEARCH AND DEVELOPMENT LABORATORIES. (G)

DODINST 3204.1 of 12/1/83 (SECNAV 3900.40), INDEPENDENT RESEARCH AND DEVELOPMENT. (6.5.5.3; D; D3.1.2)

DODDIR 3210.1 of 10/26/61 (ONR 3900.30), ADMINISTRATION AND SUPPORT OF BASIC RESEARCH BY THE DOD. (2.3)

DODDIR 3210.2 of 4/22/77, RESEARCH GRANTS AND TITLE TO EQUIPMENT PURCHASED UNDER GRANTS. (6.5.6.2)

DODDIR 4105.62 of 9/9/85, SELECTION OF CONTRACTUAL SOURCES FOR MAJOR DEFENSE SYSTEMS. (6; 6.6.4, 6.6.5)

DODINST 4105.64 of 5/8/70, TECHNICAL REPRESENTATION AT CONTRACTORS' FACILITIES. (6.7.5)

DODINST 4205.2 of 1/27/86, DOD CONTRACTED ADVISORY ASSISTANCE SERVICES (CAAS). (2.2.4.1)

DODDIR 4245.1 of 7/8/86, MILITARY DEPARTMENT ACQUISITION MANAGEMENT OFFICIALS. (1.4.8; E1.2)

DODINST 4245.3 of 4/6/83, DESIGN TO COST. (2.5.4.2; 2.7)

DODDIR 5000.1 of 9/1/87, MAJOR AND NON-MAJOR DEFENSE ACQUISITION PROGRAMS. (1.2.3; 1.4.8; 1.6; 2; 2.2.10; 2.5; 2.5.1.2; 2.5.3; 2.5.4; 2.5.5; 2.5.6; 2.5.6.2; 2.5.7.1; 2.6; 2.7; 6.1.2; 7.1.3; 7.1.4; 7.2.9; 7.4.2; 7.4.2.1.1; E1.2; E2.1; E2.3; E9.2.1; F)

DODINST 5000.2 of 9/1/87, DEFENSE ACQUISITION PROGRAM PROCEDURES. (2; 2.2.10; 2.5; 2.5.1.2; 2.5.1.3; 2.5.1.6; 2.5.1.7; 2.5.1.8; 2.5.3; 2.5.3.5; 2.5.4; 2.5.5; 2.5.6; 2.5.7.1; 2.6; 7.1.3; 7.5; E9.2.1; F)

DODDIR 5000.3 of 3/12/86, TEST AND EVALUATION. (1.2.2.2; 2; 2.5.1.4; 2.5.5.3; 7; 7.1.3; 7.1.6; 7.2.1; 7.2.1.2; 7.4; 7.4.2; 7.4.2.1.1; 7.4.4; 7.4.4.4; 7.4.5; 7.5; 7.8; H2.1; F)

DODDIR 5000.4 of 10/30/80, OSD COST ANALYSIS IMPROVEMENT GROUP. (2.7)

DODDIR 5000.39 of 1/17/83 (SECNAV 5000.39), ACQUISITION AND MANAGEMENT OF INTEGRATED LOGISTIC SUPPORT FOR SYSTEMS AND EQUIPMENT. (2.6)

DODDIR 5000.43 of 1/15/86, ACQUSITION STREAMLINING. (2.5.1.8; 2.5.4.2)

DODDIR 5000.49 of 9/1/87, DEFENSE ACQUISITION BOARD. (1.2.2.3; 2.5.6.2; E9.2)

DODDIR 5000.52 of 8/22/88, DEFENSE ACQUISITION EDUCATION AND TRAINING PROGRAM. (1.6.3; 1.6.4)

DODDIR 5025.1 of 10/16/80, DEPARTMENT OF DEFENSE DIRECTIVE SYSTEM. (B4)

DODDIR 5100.1 of 9/25/87 (SECNAV 5410.85), FUNCTIONS OF THE DEPARTMENT OF DEFENSE AND ITS MAJOR COMPONENTS. (1; 1.1; 1.2.1; 1.3; 1.4.1; 7.2.2)

DODDIR 5100.23 of 5/17/67, ADMINISTRATIVE ARRANGEMENTS FOR THE NATIONAL SECURITY AGENCY. (E1.6.6)

DODDIR 5105.19 of 8/10/78 (OPNAV 5410.12); DEFENSE COMMUNICATIONS AGENCY (DCA). (E1.6.2)

DODDIR 5105.21 of 5/19/65, DEFENSE INTELLIGENCE AGENCY. (E1.6.4)

DODDIR 5105.22 of 8/15/86, DEFENSE LOGISTICS AGENCY (DLA). (E1.6.5)

DODDIR 5105.31 of 3/18/87, DEFENSE NUCLEAR AGENCY (DNA). (E1.6.1)

DODDIR 5105.36 of 6/8/78, DEFENSE CONTRACT AUDIT AGENCY. (E1.6.3)

DODDIR 5105.40 of 4/23/86, DEFENSE MAPPING AGENCY (DMA). (E1.6.7)

DODDIR 5105.41 of 9/30/86, DEFENSE ADVANCED RESEARCH PROJECTS AGENCY. (E1.1.1)

DODDIR 5118.3 of 5/24/88, COMPTROLLER OF THE DEPARTMENT OF DEFENSE. (E1.4)

DODDIR 5128.1 of 11/19/85, ASSISTANT SECRETARY OF DEFENSE (ACQUISITION AND LOGISTICS). (1.2.2.3)

DODDIR 5129.22 of 6/26/78, DEFENSE SCIENCE BOARD. (E9.1)

DODD 5134.1 of 2/10/87, UNDER SECRETARY OF DEFENSE (ACQUISITION). (1.2.2; E1.1; E1.2)

DODDIR 5137.1 of 4/2/85, ASSISTANT SECRETARY OF DEFENSE, COMMAND, CONTROL, AND COMMUNICATIONS. (1.2.2.2)

DODDIR 5141.1 of 9/22/82, DIRECTOR, PROGRAM ANALYSIS AND EVALUATION. (1.2.4; E1.5)

DODDIR 5141.2 of 4/2/84, DIRECTOR OF OPERATIONAL TEST AND EVALUATION. (1.2.5; 7.2.1.2; E1.1; H2.2)

DODDIR 5148.2 of 2/4/86, ASSISTANT TO THE SECRETARY OF DEFENSE (ATOMIC ENERGY). (1.2.2.1.2)

DODDIR 5160.55 of 1/5/77, DEFENSE SYSTEMS MANAGEMENT COLLEGE. (E5)

DODINST 5200.21 of 9/27/79 (SECNAV 3900.35) DISSEMINATION OF DOD TECHNICAL INFORMATION. (D)

DODDIR 5230.24 of 3/18/87, DISTRIBUTION STATEMENTS ON TECHNICAL DOCUMENTS. (6.7.2)

DODDIR 5400.4 of 1/30/78, PROVISION OF INFORMATION TO CONGRESS. (4.8)

DODDIR 5545.2 of 8/20/79, DOD POLICY FOR CONGRESSIONAL AUTHORIZATION AND APPROPRIATION ACTIONS. (5.1.4)

DODINST 5545.3 of 7/5/79 (NAVCOMPTINST 7130.25), DOD PROCEDURES FOR CONGRESSIONAL AUTHORIZATION AND APPROPRIATION ACTIONS. (5.1.4)

DODINST 7000.2 of 6/10/77 (SECNAV 7000.17), PERFORMANCE MEASUREMENT FOR SELECTED ACQUISITIONS. (6.7.1)

DODINST 7000.3 of 6/22/87 (SECNAV 7700.5), SELECTED ACQUISITION REPORTS. (2.7; 6; 6.7.6; C2.1)

DODINST 7000.10 of 12/3/79 (SECNAV 7000.15), CONTRACT COST PERFORMANCE FUNDS STATUS AND COST/SCHEDULE STATUS REPORTS. (6.7.4.1; 6.7.4.3)

DODINST 7000.11 of 3/27/84 (SECNAV 7000.20), CONTRACTOR COST DATA REPORTING. (6.7.4.2)

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ABBREVIATIONS

ACAT	Acquisition Category
ACIB	Air Characteristics Improvement Board
ACNO(——)	Assistant Chief of Naval Operations for (————)
ACO	Administrative Contracting Officer
ADD	Automatic Document Distribution
ADL	Authorized Data List
ADM	Acquisition Decision Memorandum
ADM	Advanced Development Model
AFP	Approval for Full Production
AFRP	Approval for Full Rate Production
AFSC	Air Force Systems Command
ALP	Approval for Limited Production
ALRIP	Approval for Low Rate Initial Production
AMC	Army Materiel Command
AMRAD	DOD Air Munitions Requirements and Development Committee
AMSDL	Acquisition Management Systems and Data Requirements Control List
AMSL	Acquisition Management Systems List
Ao	Operational Availability
AP	Acquisition Plan
APL	Applied Physics Laboratory
ARB	Acquisition Review Board
ARC	Acquisition Review Council
ASD (——)	Assistant Secretary of Defense for (————)
ASN (——)	Assistant Secretary of the Navy for (————)
ASN(R,E&S)	Assistant Secretary of the Navy (Research, Engineering, and Systems)
ASN(S&L)	Assistant Secretary of the Navy (Shipbuilding and Logistics)
ASTD	Assistant to the Secretary of Defense (————)
AT	Acceptance Trials
ATD	Advanced Technology Demonstration
ATE	Automatic Test Equipment
ATP	Advanced Technology Panel
ATSD (——)	Assistant to the Secretary of Defense
AUTEC	Atlantic Undersea Test and Evaluation Center
AUTOVON	Automatic Voice Network
BAA	Broad Agency Announcements
BIS	Board of Inspection and Survey
BT	Builder's Trials
CAIG	Cost Analysis Improvement Group
CBO	Congressional Budget Office
CBR	Chemical, Biological, Radiological
CCDR	Contractor Cost Data Reporting
CE	Current Estimate
CEB	CNO Executive Board
CFE	Contractor—Furnished Equipment
CFSR	Contract Funds Status Report
CG (——)	Commanding General (— ————)
CG,MCRDAC	Commanding General, Marine Corps Research, Development and Acquisition Command
C^3I	Command and Control and Communications and Intelligence
CIA	Central Intelligence Agency
CINC (——)	*Commander in Chief,* (————)
CJCS	Chairman, Joint Chiefs of Staff
CMC	Commandant of the Marine Corps
CNA	Center for Naval Analyses
CNO	Chief of Naval Operations
CNR	Chief of Naval Research
COEA	Cost and Operational Effectiveness Analysis
COMOPTEVFOR	Commander, Operational Test and Evaluation Force
COSATI	Committee on Scientific and Technical Information
COTR	Contracting Officer's Technical Representative
CPAM	CNO Program Analysis Memorandum
CPFF	Cost Plus Fixed Fee
CPFG	CNO Program and Fiscal Guidance
CPIF	Cost Plus Incentive Fee
CPR	Cost Performance Report
CPS	Competitive Prototyping Strategy
CRLCMP	Computer Resources Life Cycle Management Plan
C/SCSC	Cost/Schedule Control Systems Criteria
CSS	Contract Support Services
CSTAP	CNO Study and Analysis Program
DA	Developing Agency
DAB	Defense Acquisition Board
DAE	Defense Acquisition Executive
DAE/PE	Defense Acquisition Executive (DAE) Procurement Executive (PE)
D&F	Determinations and Findings
D&V	Demonstration and Validation
DARPA	Defense Advanced Research Projects Agency
DARS	Defense Acquisition Regulatory System
DC	Development Coordinator
DCA	Defense Communications Agency
DCAA	Defense Contract Audit Agency
DCAS	Defense Contract Administration Services
DCASR	Defense Contract Administration Services Region
DCNO (——)	Deputy Chief of Naval Operations for (————)
DCP	Decision Coordinating Paper
DCS	Defense Communications System
DC/S (——)	Deputy Chief of Staff Marine Corps for (————)
DE	Development Estimate
DEP (——)	Deputy (————)
DFARS	DOD FAR Supplement
DG	Defense Guidance
DIA	Defense Intelligence Agency
DID	Data Item Description
DLA	Defense Logistics Agency
DMA	Defense Mapping Agency
DNA	Defense Nuclear Agency
DNCPPG	DON Consolidated Planning and Programming Guidance
DNFYP	Department of the Navy Five—Year Program
DOD	Department of Defense
DODISS	DOD Index of Specifications and Standards
DON	Department of the Navy
DONPIC	Department of Navy Program Information Center
DOP	Development Options Paper
DOT&E	Director Operational Test and Evaluation
DPA&E	Director Program Analysis and Evaluation
DP&E	*Director, Planning and Evaluation*
DPSB	DON Program Strategy Board
DRB	Defense Resources Board

DRDT&E	Director RDT&E
DR&DR,T&E	Director, Research and Development Requirements, Test and Evaluation
DROLS	Defense RDT&E On-Line Systems
DSB	Defense Science Board
DSMC	Defense Systems Management College
DSO	Director Staff Office
DT	Development Testing
DT&E	Developmental Test and Evaluation
DTC	Design-to-Cost
DTIC	Defense Technical Information Center
DTRC	David Taylor Research Center
DUSD	Deputy Under Secretary of Defense for (————)
ECCM	Electronic Counter Countermeasures
ECM	Electronic Countermeasures
ECP	Engineering Change Proposal
ED	Exploratory Development
EDM	Engineering Development Model
EMC	Electromagnetic Compatibility
EMI	Electromagnetic Interference
EW	Electronic Warfare
FAR	Federal Acquisition Regulation
FCRC	Federal Contract Research Center
FFP	Firm Fixed Price
FFRDC	Federally Funded Research and Development Centers
FMF	Fleet Marine Forces
FOT&E	Follow-on Operational Test and Evaluation
FPI	Fixed-Price Incentive
FRP	Full Rate Production
FSD	Full-Scale Development
FYDP	Five-Year Defense Program
GAO	General Accounting Office
GFE	Government-Furnished Equipment
GFM	Government-Furnished Material
GIDEP	Government-Industry Data Exchange Program
GOCO	Government-Owned, Contractor-Operated (Laboratory)
GOGO	Government—Owned, Government-Operated (Laboratory)
GPO	Government Printing Office
HQMC	Headquarters Marine Corps
IAC	Information Analysis Center
ICE	Independent Cost Estimates
IDA	Institute for Defense Analyses
ILS	Integrated Logistic Support
ILSM	ILS Manager
ILSP	Integrated Logistic Support Plan
INO	Institute for Naval Oceanography
INS	Institute of Naval Studies
INSURV	Board of Inspection and Survey
IOC	Initial Operational Capability (date)
IOT&E	Initial Operational Test and Evaluation
IPL	Integrated Priority Lists
IPR	In-Progress Review
IR&D	Independent Research and Development
IR/IED	Independent Research/Independent Exploratory Development
JANAP	Joint Army-Navy-Air Force Publication
JCS	Joint Chiefs of Staff
JDT&E	Joint Development T&E
JLRSA	Joint Long-Range Strategic Appraisal
JOR	Joint Operational Requirement
JOT&E	Joint Operational T&E
JPAM	Joint Program Assessment Memorandum
JSAT—EB	Joint Services Automatic Testing—Executive Board
JSCP	Joint Strategic Capabilities Plan
JSNS	Justification System New Start
JSPD	Joint Strategic Planning Document
JSPS	Joint Staff Planning System
JT&E	Joint Test and Evaluation
LBTS	Land-Based Test Sites
LCC	Life Cycle Cost
LFT&E	Livefire Test and Evaluation
LRG	Logistics Review Group
LRIP	Low Rate Initial Production
LSA	Logistics Support Analysis
MAS	Mission Area Strategies
MBI	Major Budget Issues
MCCDC	Marine Corps Combat Development Command
MCCR	Mission Critical Computer Resources
MC&G	Mapping, Charting, and Geodesy
MCOTEA	Marine Corps Operational Testing and Evaluation Activity
MCPDM	Marine Corps Program Decision Meeting
MCRDAC	Marine Corps Research, Development, and Acquisition Command
MEWS	Mission-Essential Weapon System
MI/DS	Management Information/Data Systems
MILCON	Military Construction (appropriation)
MIL-STD	Military Standard
MIPR	Military Inter-Departmental Purchase Request
MIS	Metrology Information Service
MM&SC	Major Mission & Support Category
MNS	Mission-Need Statement
MOU	Memorandum of Understanding
MP	Materiel Professional (program)
MPR	Mid-POM Review
MPT	Manpower, Personnel, and Training
MPT	Manpower, Personnel, and Training
MRTFB	Major Range and Test Facility Base
MTBF	Mean Time Between Failures
MTTR	Mean Time to Repair
MUL	Master Urgency List
MYP	Multi-Year Procurement
NADC	Naval Air Development Center
NADEC	Navy Decision Center
NAE	Navy Acquisition Executive
NAEC	Naval Air Engineering Center
NAMRL	Naval Aerospace Medical Research Laboratory
NAPC	Naval Air Propulsion Center
NAPDD	Non-Acquisition Program Definition Document
NARDIC	Navy Acquisition Research and Development Information Center
NARSUP	Navy Supplement to FAR and DFARS
NARSUP	Navy Acquisition Regulation Supplement
NATC	Naval Air Test Center
NAVAIR	Naval Air Systems Command
NAVCOMPT	Office of the Comptroller of the Navy
NAVFAC	Naval Facilities Engineering Command
NAVMEDCOM	Naval Medical Command
NAVSEA	Naval Sea Systems Command
NAVSUP	Naval Supply Systems Command
NBC	Nuclear, Biological, and Chemical
NBDL	Naval Biodynamics Laboratory
NBC	National Center for Cost Analysis
NCEL	Naval Civil Engineering Laboratory
NCSC	Naval Coastal Systems Center
NCTRF	Naval Clothing and Textile Research Facility
NDCP	Navy Decision Coordinating Paper
NDI	Non-Development Item
NDRI	Naval Dental Research Institute
NEODTC	Naval Explosive Ordnance Disposal Technology Center
NEPRF	Naval Environmental Prediction Research Facility
NHRC	Naval Health Research Center
NIF	Navy Industrial Fund
NMRI	Naval Medical Research Institute
NOA	New Obligational Authority
NOMTS	Naval Ordance Missile Test Station
NORDA	Naval Ocean Research and Development Activity
NOSC	Naval Ocean Systems Center

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NPCP	Navy Potential Contractor Program
NPDM	Navy Program Decision Meeting
NPPO	Navy Program Planning Office
NPRDC	Navy Personnel Research and Development Center
NRAC	Naval Research Advisory Committee
NRL	Naval Research Laboratory
NRR	Naval Research Requirement
NSA	National Security Agency
NSC	National Security Council
NSMRL	Naval Submarine Medical Research Laboratory
NSSA	Navy Space Systems Activity
NSWC	Naval Surface Weapons Center
NTIS	National Technical Information Service
NTP	Navy Training Plan
NTSC	Naval Training Systems Center
NUSC	Naval Underwater Systems Center
NWC	Naval Weapons Center
NWEF	Naval Weapons Evaluation Facility
O&MN	Operation and Maintenance, Navy (Appropriation)
OCNR	Office of the Chief of Naval Research
OJCS	Organization of the Joint Chiefs of Staff
OMB	Office of Management and Budget
ONR	Office of Naval Research
ONT	Office of Naval Technology
OPA	Office of Program Appraisal
OPEVAL	Operational Evaluation
OPN	Other Procurement, Navy (Appropriation)
OPNAV	Office of the Chief of Naval Operations
OPTEVFOR	Operational Test and Evaluation Force
OR	Operational Requirement
OSD	Office of the Secretary of Defense
OSN	Office of the Secretary of the Navy
OT	Operational Testing
OTA	Operational Test Agency
OT&E	Operational Test and Evaluation
P^3I	Preplanned Product Improvement
PAMN	Procurement of Aircraft and Missiles, Navy (Appropriation)
PAT&E	Production Acceptance Test and Evaluation
PBD	Program Budget Decision
PC	Program Coordinator
PCAD	Program Change Approval Document
PCR	Program Change Request
PD	Program Director
PDA	Principal Development Activity
PDA	Program Decision Authority
PDASN	Principal Deputy Assistant Secretary of the Navy PdE Production Estimate
PDM	Program Decision Memorandum
PDRC	Program Development Review Committee
PDS	Primary Development Service/Agency
PE	Program Element
PE	Planning Estimate
PEM	Program Endorsement Memorandum
PEO	Program Executive Officer
PES	Program Evaluation Summary
PIC	Navy Department Program Information Center
PM	Program Manager
PMC	Program Management Course
PMP	Program Management Proposal
PMTC	Pacific Missile Test Center
POL	Petroleum, Oil, and Lubricants
POM	Program Objectives Memorandum
PPBS	Planning, Programming, and Budgeting Systen
PPC	Proposed Program Changes
PR	Procurement Request
PRC	Program Review Committee
PRDR	Production Reliability Design Review
PRESINSURV	President, Board of Inspection and Survey
PSA	Post Shakedown Availability
QMR	Qualitative Material Requirements (Army)
QPL	Qualified Products List
RAM	System Reliability, Availability, and Maintainability
R&D	Research and Development
R&M	Reliability and Maintainability
RDA	Research, Development, and Acquisition
RDC	Rapid Development Capability
RDDS	RDT&E Descriptive Summary
RDT&E	Research, Development, Test, and Evaluation
RDT&E,N	Research, Development, Test and Evaluation, Navy (Appropriation)
RFP	Request for Proposal
RFQ	Request for Quotation
ROC	Required Operational Capabilities
RSI	Rationalization, Standardization, and Interoperability
RTF	Release to the Fleet
S&T	Science and Technology
SAE	Service Acquisition Executive
SAP	Ship Acquisition Plan
SAR	Selected Acquisition Report
SCIB	Ship Characteristics and Improvement Board
SCN	Shipbuilding and Conversion, Navy (Appropriation)
SCP	System Concept Paper
SECDEF	Secretary of Defense
SECNAV	Secretary of the Navy
SES	Senior Executive Service
SHAPM	Ship Acquisition Program Manager
SIOP	Single Integrated Operational Plan
SLEP	Service Life Extension Program
SNDL	Standard Navy Distribution List
SOSUS	Submarine Ocean Systems Underwater Surveillance
SPAWAR	Space and Naval Warfare (systems command)
SPP	Sponsor Program Proposal
SPPD	Sponsor Program Proposal Document
SSA	Source Selection Authority
SSAC	Source Selection Advisory Council
SSEB	Source Selection Evaluation Board
SSPO	Strategic Systems Program Office
SSSG	Surface Ship Survivability Group
STAR	System Threat Assessment Report
STI	Scientific and Technical Information
STIP	Scientific and Technical Information Program
STO	Science and Technology Objective
SWA	Summary Warfare Appraisal
SWBS	Ship Work Breakdown Structure
SYSCOM	Systems Command
TAB	Technical Abstracts Bulletin
TAD	Technology Area Description
T&E	Test and Evaluation
TECG	Test and Evaluation Coordinating Group
TECHEVAL	Technical Evaluation
TEIN	T&E Identification Number
TEMP	Test and Evaluation Master Plan
TLR/TLS	Top Level Requirements/Top Level Specifications
TOA	Total Obligation Authority
TOR	Tentative Operational Requirement
TRAC	Technical Reports Awareness Circular
TTIC	Test Technical Information Center
USD(A)	Under Secretary of Defense (Acquisition)
USN	Under Secretary of the Navy
VCNO	Vice Chief of Naval Operations
WBS	Work Breakdown Structure
WRB	Warfare Requirements Board
WSA	Warfare Systems Architecture (standards)
WSE	Warfare Systems Engineering (standards)
WUIS	Work Unit Information System
WWMCCS	Worldwide Military Command and Control System