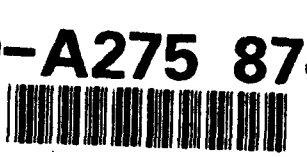

(1)

Department of the Navy
RDT&E Management Guide

January 1985

NAVSO P-2457 (Rev. 1-85)

Department of the Navy
RDT&E Management Guide

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NAVSO P-2457 (Rev. 1-85)

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

FOREWORD

18 January 1985

The 1985 edition is the ninth printing of the Department of the Navy RDT&E Management Guide, published originally in 1964.

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

Additional copies for official use may be obtained from USNPFC, Philadelphia (see ordering instructions on page iii).

Recommendations for additions, deletions, and corrections are solicited and should be forwarded to my office, following the directions in the introduction.

MELVYN R. PAISLEY

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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 Chief of Naval Research (Attn: ONR 520), 800 N. Quincy St., Arlington, VA 22217.

CONTENTS

LIST OF FIGURES

INTRODUCTION

The Department of the Navy RDT&E Management Guide was developed to aid both newcomers to RDT&E management and practicing "journeymen." For newcomers, the Guide provides a means of rapid orientation in the Department of the Navy system for managing its RDT&E effort. For practicing RDT&E managers, the Guide is a quick source of general information and identifies directives containing detailed guidance.

This manual is a guide, not a directive. It cannot be cited as authority for action. It supplements directives by helping the user perceive the overall system defined by the totality of *all* directives and identify those applicable to a particular problem. Consult the latest edition of referenced directives for current official guidance.

Directives on which the text is based are listed following the portions to which they apply. Directives applicable to an entire section, such as 1.6, "Project Management," are listed following the section introduction. The half dozen or so most important directives on each chapter subject are listed at the end of the chapter.

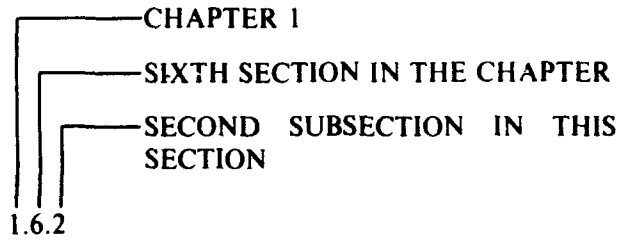
Content and Organization of the Guide

The Guide consists of seven chapters and eight appendixes. Chapters cover organization for RDT&E and the planning, programming, budgeting, execution, and test and evaluation of RDT&E effort. The appendixes are a collection of official information brought together for reference.

The Master Reference List, which is bound after the appendixes, shows the edition, promulgation date, and subject for all referenced directives.

To aid the reader in locating desired information, both a comprehensive index and detailed tables of contents preceding each chapter and appendix are provided.

Index citations are by location numbers rather than by page numbers. For example, an index listing of "Charters for designated projects"...1.6.2 indicates that a discussion of the subject may 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 printed on the top outer corners of those pages. The location numbers of material in an appendix are preceded by the letter of the appendix; e.g., E1.1.2.

The newcomer to RDT&E management, the reader for whom the Guide is primarily intended, can expect some difficulty with the numerous abbreviations — DCP, BIS, FYDP, etc. Such abbreviations were used not only to save space but also because they are part of the language of RDT&E management communications. Each time a new abbreviation is introduced, the full expression is given first, followed by the abbreviation in parentheses. Translation of all abbreviations used in this edition, and many more, is found inside the front and back covers.

Revision, Growth, and User Feedback

The **RDT&E Management Guide** is designed to be a living document — constantly responding to changes in RDT&E management structure and processes; constantly improving in content and presentation.

Using commands and individuals are encouraged to submit comments and recommended changes. Less extensive feedback — even mere indications that specific sections are judged to be weak—is useful and solicited. Feedback may be forwarded directly by individuals to:

Office of the Assistant Secretary of the Navy
(R,E&S)
Special Assistant for Financial Management
Office of Naval Research (Code 500)
800 N. Quincy Street
Arlington, VA 22217

CHAPTER 1 ORGANIZATION FOR RDT&E

TABLE OF CONTENTS

CHAPTER 1
ORGANIZATION FOR RDT&E

In this chapter, organization for RDT&E is discussed in a summary fashion from a somewhat special viewpoint. Emphasis here is on the fundamental responsibilities of officials and agencies, and on interrelationships — how they work together in RDT&E matters.

The information in this chapter is but a small part of the total information provided by the Guide on the subject of organization for RDT&E. This is actually what the entire Guide is all about, since each chapter is devoted, at least in part, to "who does what" in carrying out various functions. In addition, major sections provide information on individual organizations, for example, Appendix E, "Organizations"; F, "Research and Development Laboratories/Centers"; and G, "Test and Evaluation."

1.1 FUNCTIONS OF THE DEPARTMENT OF DEFENSE

A theme which runs through this Guide is the idea that RDT&E is not an end in itself, but rather a systematic means for providing the tools for attainment of higher purposes. Navy RDT&E is supported to provide improved tools and techniques for optimal mission effectiveness of Navy and Marine Corps forces, which are in turn the means for supporting the overall mission of the Department of Defense (DOD).

The Department of Defense maintains armed forces to perform the following functions:

- To support and defend the Constitution of the United States against all enemies, foreign and domestic.
- To provide that each military department shall be separately organized under its own Secretary and shall function under the direction, authority, and control of the Secretary of Defense.
- To insure, by timely and effective military action, the security of the United States, its possessions, and areas vital to its interest.
- To uphold and advance the national policies and interests of the United States.
- To safeguard the internal security of the United States.

*DODDIR 5100.1 (SECNAV 5410.85)**

1.2 RDT&E RESPONSIBILITIES AT THE DEPARTMENT OF DEFENSE LEVEL

1.2.1 Secretary of Defense. Functions of the Department of Defense and its component agencies are performed under the direction, authority, and control of the Secretary of Defense (SECDEF). He serves under the direction of the President, who, as Commander-in-Chief of the Armed Forces, is responsible for final decisions on broad military problems.

The responsibilities and authorities of the Secretary of Defense are spelled out in the National Security Act of 1947 as amended. The Act makes it clear that Congress intends that the Secretary of Defense be in an authoritative position in relation to the affairs of each of the military departments, particularly for RDT&E. These basic policies are reflected in the following quotation from the Act:

> In enacting this legislation, it is the intent of Congress to provide a

*For additional information on subjects discussed in this Guide, consult the listed references. Titles, current editions, and promulgation dates of directives on which this edition is based can be found in the Master Reference List following the appendixes. When a DOD directive has been promulgated as an enclosure to a Navy directive, the promulgating directive is shown in parentheses following the DOD listing.

> comprehensive program for the future security of the United States; to provide for the establishment of integrated policies and procedures for the departments, agencies, and functions of the Government relating to national security; to provide a Department of Defense, including the three military departments of the Army, the Navy (including naval aviation and the United States Marine Corps), and the Air Force under the direction, authority, and control of the Secretary of Defense; to provide that each military department shall be separately organized under its own Secretary and shall function under the direction, authority, and control of the Secretary of Defense . . . to eliminate unnecessary duplication in the Department of Defense, and particularly in the field of research and engineering by vesting its overall direction and control in the Secretary of Defense . . . .

DODDIR 5100.1 (SECNAV 5410.85)

1.2.2 Under Secretary of Defense, Policy (USDP). The Under Secretary of Defense, Policy is a principal member of the Defense Systems Acquisition Review Council (DSARC) (see 2.5.6.2) and the Defense Resources Board (DRB) (see E9.6).

DODINST 5000.2; DODDIR 5111.1

1.2.3 Under Secretary of Defense, Research and Engineering (USDRE). The position of Under Secretary of Defense for Research and Engineering was established in October 1977 as one of two third-level officials in the Department of Defense, the other being the Under Secretary of Defense, Policy. The two Under Secretaries take precedence directly after the Deputy Secretary and the Service Secretaries and ahead of the Assistant Secretaries. The USDRE has responsibility for the entire range of matters having to do with the acquisition of Defense systems. His specific responsibilities include the following:

> The USDRE is the principal advisor and assistant to the Secretary of Defense for Department of Defense scientific and technical matters; basic and applied research; environmental services; and the development and acquisition of weapon systems. The USDRE is also the Defense Acquisition Executive.

To enable USDRE to fulfill these responsibilities, the Secretary of Defense has delegated him authority to approve, modify, or disapprove programs and projects of the military departments and other Department of Defense agencies in his (USDRE's) assigned fields.

DODDIR 5129.1

1.2.3.1 Deputy Under Secretary of Defense, R&E (Research and Advanced Technology) (DUSDRE(R&AT)). The Deputy Under Secretary of Defense, R&E (Research and Advanced Technology) advises USDRE concerning the DOD's commitments in research, exploratory development, and non-system-oriented advanced development.

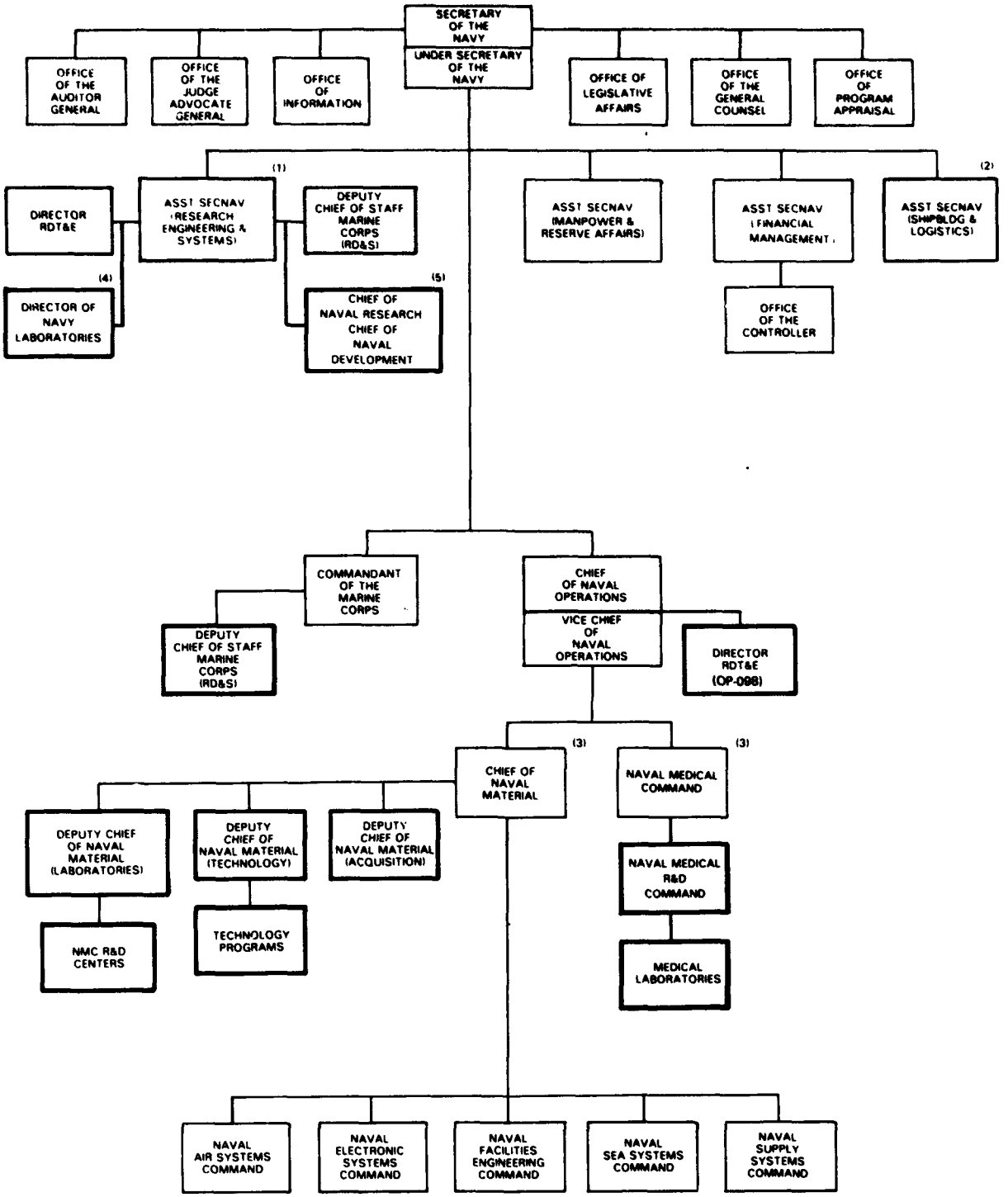
1.2.3.2 Director Defense Test and Evaluation (DDTE). DDTE is the principal T&E official in OSD for all T&E matters other than Operational Test and Evaluation (OT&E). His responsibilities include formulation of T&E policy, approval of T&E Master Plans (TEMP), and assessment of T&E results for the Defense Systems Acquisition Review Council (DSARC). (See G2.1)

DODDIR 5000.3

1.2.4 Defense Acquisition Executive (DAE). Each agency, under the provisions of OMB Circular A-109, is required to establish an "Acquisition Executive" to integrate, unify, and monitor the application of the agency's process of acquisition of major systems. The DOD's Defense Acquisition Executive, within this general responsibility, has among others the key functions of chairmanship of the Defense Systems Acquisition Review Council (DSARC) and making major milestone decision recommendations to the SECDEF. The USDRE is the Defense Acquisition Executive.

DODDIR 5000.1

1.2.5 Director, Program Analysis and Evaluation (DPA&E). The DPA&E is a principal member of the Defense Systems Acquisition Review Council (DSARC) (see 2.5.2.5).



NOTES:
(1) Navy Acquisition Executive for all stages of Navy acquisition programs with the exception of ship or ship conversion acquisitions up to the full-scale production decisions (Milestone III).
(2) Navy Acquisition Executive for all stages of ship conversion acquisitions and for all other Navy acquisition programs following the full-scale production decision (Milestone III).
(3) Also responsive to the Commandant of the Marine Corps for Marine Corps needs.
(4) Also serves as DCNM (Laboratories).
(5) Also serves as DCNM (Technology).

Figure 1-1. Department of the Navy Headquarters Organization for RDT&E (Principal RDT&E elements highlighted)

1.2.6 Director Operational Test and Evaluation (DOT&E). DOT&E is the Principal Staff Assistant and advisor to SECDEF for (OT&E). He prescribes policies and procedures for the conduct of OT&E and carries out other duties described in more detail in G2.2 and his charter.

DODDIR 5141.2

1.3 JOINT CHIEFS OF STAFF (JCS)

The Joint Chiefs of Staff have responsibilities toward the RDT&E programs of the Services as follows:

> To advise and assist the Secretary of Defense in research and engineering matters by preparing: statements of broad strategic guidance to be used in the preparation of an integrated DOD program; statements of overall military requirements; statements of the relative military importance of development activities to meet the needs of the unified and specified commanders; and recommendations for the assignment of specific new weapons to the armed forces.

DODDIR 5100.1 (SECNAV 5410.85)

1.4 DEPARTMENT OF THE NAVY RDT&E RESPONSIBILITIES

Organization for RDT&E, depicted in Figure 1-1, can be discussed meaningfully only in terms of RDT&E's higher purposes. The fundamental objectives of the Department of the Navy are:

- To organize, train, equip, prepare, and maintain the 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, including the support of such forces and the forces of other military departments, as directed by the Secretary of Defense, which are assigned to unified or specified commands. Support, as here used, includes administrative, personnel, material, and fiscal support, and technological support through research and development.

SECNAVINSTS 5430.7, 5430.67

1.4.1 Secretary of the Navy (SECNAV). The Secretary of the Navy heads the Department of the Navy under the direction, authority, and control of the Secretary of Defense. He is responsible for the policies and control of the Department of the Navy, including its organization, administration, operation, and efficiency.

DODDIR 5100.1 (SECNAV 5410.85)

1.4.2 Assistant Secretary of the Navy (Research, Engineering, and Systems) (ASN(R,E&S)). Under SECNAV, the Assistant Secretary of the Navy (R,E&S) is responsible for all matters related to research, development, engineering, test and evaluation within the Department of the Navy except for ship design and construction, and for oceanography, ocean engineering, and closely related matters.

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

Within the Department of the Navy, ASN(R,E&S) functions as a counterpart and principal point of contact for USDRE. He also serves as Chairman of the Research and Development Committee and is responsible for supervision of the Office of Naval Research. Up to the point at which the decision is made to transition to full-scale production, the ASN(R,E&S) is the Navy Acquisition Executive for all systems except ships (see 1.4.4).

The ASN(R,E&S) has a personal technical staff made up of military and civilian professionals. For technical staff assistance in fulfillment of his department-wide responsibility for policy supervision of all research, development, engineering, test, and evaluation efforts within the Department of the Navy, the ASN(R,E&S) looks to his principal advisors: Director RDT&E (OP-098); the Deputy Chief of Staff (RD&S),

Marine Corps; and the Chief of Naval Research/Chief of Naval Development. On matters concerning the Naval Oceanographic Program and those concerning the naval laboratories and Research and Development Centers, the ASN(R,E&S) is advised and assisted, respectively, by the Oceanographer of the Navy (OP-952) and by the Director of Navy Laboratories (DNL).

1.4.3 Assistant Secretary of the Navy (Shipbuilding and Logistics) (ASN(S&L)). The Assistant Secretary of the Navy (Shipbuilding and of Logistics) is responsible for all aspects and stages of ship design for ships in the Five-Year Shipbuilding Program; the physical integration of shipboard components, subsystems, and combat systems; and life-cycle support. The ASN(S&L) is responsible for the management and support of programs following the full-scale production decision, which is made or recommended jointly by ASN(R,E&S) and ASN(S&L). For ships and for all acquisitions following the full-scale production decision the ASN(S&L) is the Navy Acquisition Executive.

In addition, subject to 1.4.2 and 1.4.4, the ASN(S&L) is responsible for business strategy and contractual policy, and for logistics and life-cycle support of all acquisition programs.

SECNAVNOTE 5430 of 10 June 1981

1.4.4 Navy Acquisition Executive (NAE). The Navy Acquisition Executive (NAE) is the principal advisor and staff assistant to the SECNAV for the acquisition of Navy systems and equipment. The NAE is normally the permanent chairman of the DNSARC. The ASN(R,E&S) acts as NAE for all programs except ships up to the point at which the decision is made to transition to full-scale production. Responsibilities as NAE shift to the Assistant Secretary of the Navy (Shipbuilding and Logistics) (ASN(S&L)) for all program decisions following Milestone III and for all stages of ship or ship conversion acquisitions in the Five-Year Shipbuilding Program.

SECNAVINST 5000.1

1.4.5 Chief of Naval Operations (CNO). The Chief of Naval Operations is responsible for supervision and command of all functions and activities of the Operating Forces of the Navy, the Naval Material Command and assigned shore (field) activities.

In the overall division of labor which characterizes development of future operational capabilities, CNO is primarily concerned with what capabilities are of most value, while the Chief of Naval Material and other RDT&E producers attack the problem of how to achieve these capabilities. In meeting this general responsibility, the Office of the Chief of Naval Operations carries out these functions:

- Define capabilities, potentially attainable with the aid of RDT&E, of importance to future mission capabilities of operating forces.
- Appraise the military worth of capabilities which advancing science and technology make potentially attainable through RDT&E effort.
- Appraise RDT&E development efforts from the standpoint of potential military worth in relation to costs and approve those projects which promise the greatest return from the resources invested.

OPNAVINST 5430.48

1.4.5.1 Director RDT&E (DRDT&E) (OP-098). CNO's Director Research, Development, Test and Evaluation implements the CNO's responsibilities for the planning, programming, and appraising of RDT&E. His role in the various RDT&E management processes is discussed in each of the following chapters of the Guide. He also assists the ASN(R,E&S).

1.4.6 Commandant of the Marine Corps (CMC). The Commandant of the Marine Corps supervises and commands the United States Marine Corps. His general duties include the following specific ones related to RDT&E:

- To plan for and determine the support needs of the Marine Corps for equipment, weapons or weapons systems, materials, supplies, facilities, maintenance, and supporting service. This

responsibility includes the determination of Marine Corps characteristics of equipment and material to be procured or developed, and the training required to prepare Marine Corps personnel for combat.

- To develop, in coordination with other military services, the doctrines, tactics, and equipment employed by landing forces in amphibious operations.

- To plan for and determine development requirements of the Marine Corps. To provide for the development, test, and evaluation of new weapon systems and equipment to ensure their being adequate and responsive to immediate and long-range objectives as well as within available resources. To provide direct staff assistance to the Assistant Secretary of the Navy (Research, Engineering and Systems) in the direction, review, and appraisal of the overall USMC RDT&E Program.

1.4.6.1 Deputy Chief of Staff (Research, Development and Studies) (DC/S(RD&S)). The CMC is assisted in performance of his RDT&E responsibilities by the DC/S(RD&S). He also advises the ASN(R,E&S) on all matters relating to Marine Corps RDT&E.

1.4.7 Chief of Naval Material (CNM). The Chief of Naval Material is responsible for supervision and command of all functions and activities of the Naval Material Command (NMC).

His general RDT&E functions include:

- Translating operational requirements from CNO and CMC into hardware systems and objectives for new technological capabilities required to make possible future man-machine systems of superior operational characteristics.

- Managing the technology base development effort.

- Defining capabilities made possible by advancing science and technology for consideration by CNO and CMC.

- Developing detailed plans for RDT&E projects to satisfy approved requirements for warfare systems.

- Overseeing implementation of RDT&E programs of the Naval Material Command.

OPNAVINST 5450.176; NAVMATINST 5430.60

1.4.7.1 Deputy Chief of Naval Material for Laboratories (DCNM(Labs)) (MAT 05)/Director of Navy Laboratories (DNL). The DCNM(Labs) serves as the CNM's principal executive and line manager for the NMC R&D Centers. As DNL he serves in a staff and advisory capacity to ASN(R,E&S) for matters relating to Navy Laboratories.

NAVMATINST 5430.60

1.4.7.2 Deputy Chief of Naval Material for Technology (DCNM(T)) (MAT-07). The DCNM(T) reports to the Chief of Naval Material for matters related to the technology base and Navy technical information. He is responsible for managing the Navy Exploratory Development Program; and developing, coordinating, and assessing technology development and demonstration. He is also responsible for management of technical aspects of the Navy's Industrial R&D(IRAD) program and its coordination with the in-house Navy R&D program.

The Chief of Naval Research (CNR) is assigned additional duty as DCNM(T). He also acts as the Chief of Naval Development (CND), reporting to ASN(R,E&S). He is supported in his functions as DCNM(T)/CND by the Office of Naval Technology (ONT) and as CNR by the Office of Naval Research (ONR).

1.4.7.3 Deputy Chief of Naval Material for Acquisition (DCNM(A)) (MAT-08). The DCNM(A) reports to the CNM for all matters relating to Navy material acquisition. He is responsible for the Navy material acquisition process, program evaluation, systems engineering, production, test and evaluation, ranges and targets, acquisition, and project management policy.

1.4.8 The Naval Material Command Organization for RDT&E. The Naval Material Command

(NMC) is made up of the Headquarters Naval Material Command (NAVMAT), Project Directors and Project Managers reporting to the Chief of Naval Material, the Naval Air Systems Command, the Naval Sea Systems Command, the Naval Electronic Systems Command, the Naval Supply Systems Command, the Naval Facilities Engineering Command, Project Directors and Project Managers reporting to the Systems Commanders, and all laboratories/centers and certain other shore activities reporting to the Chief of Naval Material and the Systems Commanders.

Most, but not all, of the NMC RDT&E program is directly managed by the Systems Commands (SYSCOMS), each of which has a senior official responsible for Research and Technology (R&T) matters. Information on the RDT&E establishment of each of the SYSCOMS can be found in Section E5. Information on the RDT&E field activities of the Naval Material Command may be found in Appendixes F and G.

NAVMATINST 5460.2

1.4.9 Chief of Naval Research (CNR). The Chief of Naval Research (CNR) heads the Office of Naval Research (ONR). The Office of Naval Research was established as a separate activity within the Executive Office of the Secretary of the Navy by Public Law 588, 79th Congress (10 U.S.C. 5150) of August 1946. CNR is responsible to the Secretary of the Navy through the Assistant Secretary for Research, Engineering and Systems. (See E7.) The CNR performs additional duty as Chief of Naval Development (CND), reporting to ASN(R,E&S), and as Deputy Chief of Naval Material for Technology (DCNM(T)), reporting to CNM (see E4.2.6). The CNR's responsibilities include the following functions:

- Provide leadership to the research program of the Navy by initiating, sponsoring and conducting research to augment and enhance research and development conducted by other offices and activities of the Department of the Navy.

- Provide budgeting, accounting, and related reporting and data processing services for ASN(R,E&S) which are required for his management and control of the RDT&E,N appropriation along with the services required by CNO and CNM to fulfill planning and programming of the RDT&E program. The format for the annual RDT&E budget submittals will be prescribed by ASN(R,E&S). CNR consolidates and summarizes the annual RDT&E budget submittals of the development agencies.

- Supervise, administer, and control all activities within or on behalf of the Navy relating to patents, inventions, trademarks, copyrights, royalty payments, and similar matters.

SECNAVINST 5430.20,

1.4.10 Commander, Naval Medical Command. The Commander, Naval Medical Command, under the Chief of Naval Operations, supervises and commands all functions and activities of the Naval Medical Command, including shore activities. He is assisted in the performance of RDT&E related functions by the Deputy Commander for Fleet Readiness and Support and the Commanding Officer, Naval Medical Research and Development Command (see E8).

1.5 COUPLING MECHANISMS

The RDT&E process has been characterized as a multi-stage information generation and conversion process with information-flow coupling between the stages. From the standpoint of the productivity of the entire process, effective information links between the stages are as important as good research and engineering within the stages. Various institutional arrangements and organizations have evolved to facilitate the coupling process.

1.5.1 RDT&E Program Interrelationships. The discussion in this chapter of organizations and the responsibilities of individual officials can give an incorrect impression of separate parts acting unilaterally and disjointedly rather than of an integrated RDT&E system. While perfect coordination is unattainable, various elements interact

in relatively effective ways in planning, executing, and managing the Navy RDT&E Program.

The *processes* through which RDT&E effort is planned, executed, and managed provide the bonds which integrate the various parts of the system. Review of requirements and planning documents, the budgetary process, establishment of test criteria, etc., precipitate discussions of both broad issues and specific concerns out of which a reasonable, coherent view of common purpose emerges. Thus in one aspect, the following chapters on planning, programming, budgeting, and test and evaluation discuss the links which join the organizational elements discussed in this chapter into an integrated system.

1.5.2 Advisory Panels, Committees and Boards. An organizational means of providing essential information flow in a usable form is the face-to-face group. Such groups range from advisory boards, which provide information and expert advice, to committees composed of responsible officials, which make policy as well as provide for a flow of information (see E9).

1.5.3 Scientific and Technical Information (STI). In a sense, the basic output of RDT&E effort is STI. The Navy's ability to (1) provide RDT&E performers and managers with necessary STI inputs, (2) collect and store the output STI, and (3) make that output available where needed, constrain overall RDT&E effectiveness. Many organizations have been established expressly to support the collection, storage, and dissemination of STI. Various information functions, services, and organizations are integrated through the Scientific and Technical Information Program (STIP). See Appendix D for further information on the STIP and STI services.

DODDIR 3200.12; SECNAVINST 3900.43

1.6 PROGRAM MANAGEMENT

Program management is a central organizational device for integrating the RDT&E effort required to develop systems or to provide for development of interrelated capabilities in a problem area such as Directed Energy Systems or ASW.

DODDIR 5000.1; SECNAVINST 5000.1;

1.6.1 Why Program Management?. The central characteristic of program management is organization by output or purpose. Consequently, the Program Manager is highly oriented toward the hardware end-product of his program. In contrast, universities, many laboratories, and some industries are organized around functions, skills, or disciplines.

Both types of organization are essential to effective and economical RDT&E. Functional organization is best for advancing the state of the art, for it brings together the necessary critical mass of skills, equipment, and physical facilities required for effective performance. Organization by purpose is necessary to integrate the output of the functional organization in a way that actually accomplishes the desired purposes. Thus program management cuts across the functional organizations to form what might be termed a "grid" organization. Figure 1-2 illustrates typical organizational relationships of a project office.

1.6.2 Establishment of Programs. Managers of designated programs operate under charters issued by the Chief of Naval Material or by the Commander of a Systems Command. In general, when the work of a program is, for the most part, under the cognizance of a single Systems Command, the charter will be issued by the Systems Commander and the Program Manager will report to him. When it is determined that critical interfaces will exist either with other military services (or government agencies) or between Systems Commands, the CNM may establish a Designated Program, and the Program Manager will report to him.

Program charters, which are issued as instructions in the 5430 series, prescribe the scope of authority, responsibility, and operating relationships of the Program Manager.

NAVMATINST 5000.21

1.6.3 Staffing the Program Office. The program is staffed with the number of business and technical management personnel required to fulfill the direct responsibilities of the Program Manager (PM).

Effective performance by the Program Manager requires both the authority of rank and the authority of knowledge. As a general rule;

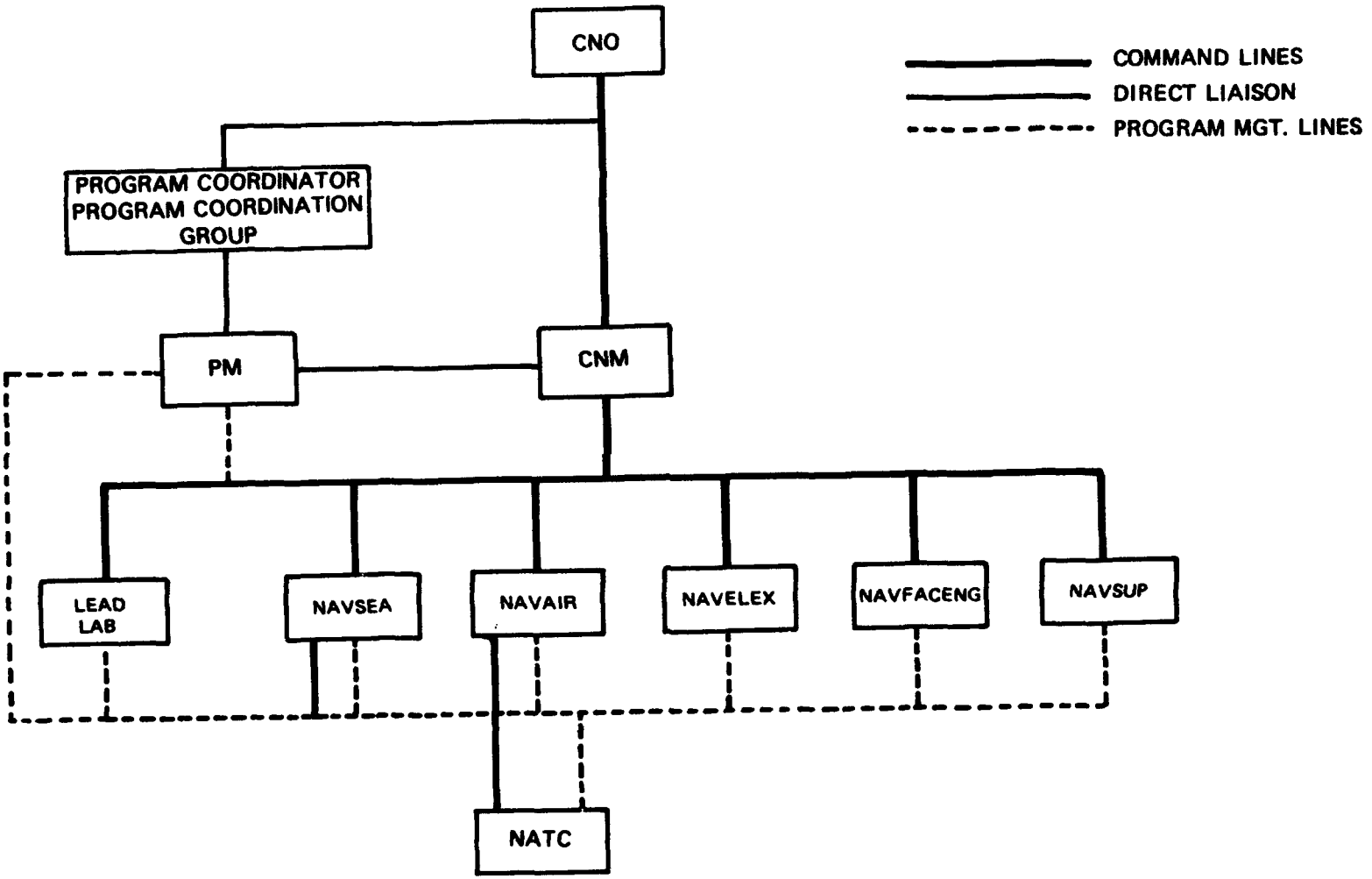


Figure 1-2. Organizational Relationships of a Program Office

the PM will be a Colonel or Navy Captain, or an SES civilian; with flag officers heading the more critical programs. Personnel considered for assignment as senior members of PM staffs should be those who can be expected to be available for at least three years, with major Program Managers serving four-year tours. The PM and his senior staff members are normally graduates of the program management program of the DOD-sponsored Defense Systems Management College (DSMC) or have equivalent training or experience.

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.

DODDIR 5000.23; SECNAVINST 12950.11; OPNAVINST 1211.8;

1.7 PARTICIPANTS IN THE ACQUISITION PROCESS

The acquisition of a major system requires a coordinated effort. Responsibilities of some of the principals are discussed below.

DON Programming Manual, Appendix NB

1.7.1 Appropriation Sponsor. He is a Deputy CNO (DCNO) or Director, Major Staff Office (DMSO) charged with supervisory control over an appropriation. The Director RDT&E (OP-098) is Appropriation Sponsor for the RDT&E,N appropriation.

1.7.2 Resource Sponsor. A Resource Sponsor is the DCNO/DMSO responsible for preparation, substantiation, and justification of a Navy position on the level, composition, and related direct support for a force, platform, or support area.

1.7.3 Program Sponsor. The Program Sponsor is the DCNO or DMSO responsible for determining program objectives, time-phasing and support requirements, and for appraising progress, readiness, and military worth for a given weapon acquisition.

1.7.4 Program Coordinator (PC). The Program Coordinator is the OPNAV official responsible to the Program Sponsor for the formulation and administration of an acquisition program.

1.7.4.1 Program Coordination Group. The Program Coordination Group assists the Program Coordinator in the execution of his duties. It includes the Program Manager and representatives of other activities participating in the program and is chaired by the Program Coordinator.

1.7.5 Development Coordinator (DC). The Development Coordinator (DC) is an official on the staff of DRDT&E (see 1.4.5.1) assigned cognizance for a development program.

1.7.6 Program Manager (PM). A Program Manager is an individual within the NMC 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.)

1.7.7 Program Director (PD). The Chief of Naval Material or a Systems Commander may designate a Program Director (PD) to supervise several Program Managers for programs in a single warfare/mission area.

SECNAVINST 5000.1

1.7.8 Ship Acquisition Program Manager (SHAPM). A SHAPM is a NAVSEA Program Manager who manages the development, design, construction, and conversion of assigned ship types. He operates under a charter from Commander, Naval Sea Systems Command as approved by the Chief of Naval Material.

NAVMATINST 5000.21

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

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

1.7.11 Acquisition Program Sponsor. An Acquisition Program Sponsor is the DC/S in HQ

Marine Corps who is responsible for determining the objectives and other parameters of an acquisition program and for appraising progress, readiness, and military worth for the program. He is assisted by an Acquisition Sponsor Program Officer, responsible for mission area and goals considerations, and an Acquisition Program Officer, responsible for technical considerations.

MCO P5000.10

1.8 RDT&E FIELD ACTIVITIES

Navy laboratories and other RDT&E field activities are a vital source of strength for the Department of the Navy RDT&E effort.

The Navy develops and maintains laboratories of acknowledged excellence in those fields of science and technology pertinent to its needs. 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 RDT&E field activities, see Appendixes F and G.

SELECTED REFERENCES ON ORGANIZATION FOR RDT&E

DODDIR 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.

SECNAVINST 3910.3, "Navy Research and Development Laboratories," sets forth responsibilities for management of Navy laboratories, including DNL charter.

SECNAVINST 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.

SECNAVINST 5430.67, "Assignment of responsibilities for research, development, test, and evaluation," defines the RDT&E responsibilities of senior DON officials including CNO, CMC, CNM, and CNR.

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.

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

CHAPTER 2 PLANNING

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CHAPTER 2
PLANNING

This chapter is concerned with the management of progress through innovation; specifically, it develops the role of RDT&E in that process.

It should be emphasized that RDT&E is only part of the innovative process which must be managed as an integrated whole to provide maximum assured progress in naval operating capabilities. RDT&E provides the means for advancing the capabilities required to implement the Department of the Navy's overall strategy for the future. That strategy is worked out in the long-range planning process and documented in the plans which are discussed in the first two sections of the chapter and in section 3.4 of the next chapter.

In the remaining sections of the chapter, the development of plans (for providing the capabilities required to implement the Navy's overall strategy for dealing with the future) is traced from the genesis of plans in the interaction of scientific and technological possibilities with long-range military capability needs, to their definitive expression in plans for systems under development. This analysis is in terms of two major functions: development of the technological base and development of hardware-based operational capabilities.

Unless one understands the main function of planning documents, one might easily conclude that the time spent in documentation is disproportionate to the worth of such documents. But such a conclusion is erroneous, for the true function of documents — the payoff which justifies the considerable investment in their preparation — lies not so much in possession and use of the resulting documents as in the *process* of their development.

Ideally, preparation of documents should catalyze decisions on crucial issues (such as the nature of the Navy we strive to help bring into being through RDT&E effort), ensure that problems are thought through, and record the results of an interactive decision process involving numerous participants. The resulting plans project future capability needs and provide the assumptions needed for sound RDT&E planning.

2.1 NAVY AND MARINE CORPS PLANNING SYSTEM

The Navy and Marine Corps Planning System provides for the development of Navy and Marine Corps plans and associated programs for direct inputs into joint plans and service consideration thereof. These plans form the basic foundation for further planning and programming throughout the Department of the Navy. The Navy and Marine Corps Planning System is responsive to, and operates within, the functional constraints resulting from its interaction with Joint Strategic Planning System. In addition, it accommodates the constraints imposed by the lead times required for research, development, test and evaluation, the construction time for ships, aircraft, and facilities, and the provision of trained personnel for weapon systems.

*DON Programming Manual, Chapter II, "Planning"**

2.1.1 Navy and Marine Corps Planning System Concept. The Navy and Marine Corps Planning System serves three basic purposes:

- First, it provides for the development of Navy concepts, requirements, and objectives and for their convincing

*For additional information on subjects discussed in this Guide, consult the listed references. Titles, current editions, and promulgation dates of directives on which this edition is based can be found in the Master Reference List following the appendixes. When a DOD directive has been promulgated as an enclosure to a Navy directive, the promulgating directive is shown in parentheses following the DOD listing.

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.

2.1.2 Navy and Marine Corps Planning System Intrarelationships. The various plans and documents of the Navy and Marine Corps Planning System interact in such a way that, taken together, they constitute an integrated "system." The output of some of the plans constitutes a major part of the inputs to others, thus providing overall integration and coherence.

The Navy and Marine Corps Planning System also is designed to be responsive 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.

2.1.3 Planning System Documents. The following documents, and others in section 3.4 of the next chapter, are of particular interest to R&D.

2.1.3.1 Marine Corps Long-Range Plan (MLRP). The Marine Corps Long-Range Plan describes the operational, organizational, and material concepts that the Marine Corps intends to implement in order to carry out its projected roles and missions. The MLRP covers the period 10 to 20 years in the future. Long-range RDT&E objectives are stated in terms of qualitative and quantitative improvements to be attained. These are provided in sufficient detail to allow a beginning of the RDT&E effort within the structure of the Department of Defense Planning, Programming, and Budgeting System. The MLRP is the source document for the generation of Marine Corps Science and Technology Objectives.

2.1.3.2 Marine Corps Mid-Range Objective Plan (MMROP). The MMROP is created against the background of the MLRP. It translates the long-range plan into more definitive goals which must be accomplished in the period 1 to 10 years in the future to provide for an orderly progression from the present towards the long-range concept of Marine Corps combat forces.

2.1.3.3 Marine Corps Science and Technology Objective (STO-MC), Required Operational Capabilities (ROCs), and Operational Requirements (ORs). STOs state Marine Corps operational capabilities objectives for the period 10 to 20 years in the future, as derived from the Marine Corps Long-Range Study (MLRS) and the MLRP. The STOs provide Marine Corps Guidance for technology base programs which lead to concepts, systems, and equipment for the Marine Corps of the future (see C5.2). The ROC and the OR are concise statements of operational needs which provide the basis, respectively, for Marine Corps acquisition programs and for Navy-funded acquisition programs requiring R&D in support of the Marine Corps (see 2.5.9).

2.2 OVERVIEW OF THE RDT&E PROCESS

In this section, the RDT&E 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 RDT&E Process. It is not uncommon for people to equate RDT&E with the development of hardware, a view which is as limited as it is erroneous. The product or output which justifies RDT&E effort is an operational capability. Weapons hardware is but one subsystem of the operational capability system. This point must be reemphasized: The objective of

RDT&E 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 for training of their replacements.
- Facilities.
- Material — consumables, spares, etc.
- Information — technical maintenance data, operating tactics, maintenance procedures, etc.

2.2.2 Nature of the RDT&E Process. The function of RDT&E 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, hence are not RDT&E problems. RDT&E is a multistage information generation and conversion process characterized by the integration and conversion of information within stages and information flow coupling between stages.

RDT&E has been characterized as a way of progressively reducing uncertainty by buying information. In the earliest stages of the RDT&E process, uncertainty is usually very high as to the probable results of effort and the value of the results. Decisions on what to do, 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 RDT&E investment decisions. In the case of major weapon systems, a very substantial investment is usually justified.

Fortunately, costs and uncertainty are inversely related in the RDT&E process. At the research end, uncertainty is usually high but the cost relatively low. At the systems development end of the RDT&E process, cost per project can be extremely high while uncertainty is relatively low.

The RDT&E manager, like all managers, is duty-bound to attempt to put the resources subject to his discretion to their most productive use. The obligation will cause him to "bet on longshots" where costs are low relative to payoff from success and to invest heavily 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 mission or to neutralize or reduce a Navy capability. The interface of threat with each weapon system is continuous throughout the life of the system. In each weapon system program it is required that specific planning be included for obtaining and using threat intelligence for the life cycle of the program.

Threat statements are required to be included in program documentation (JMSNS, SCP, DCP/IPS, NDCP)and to be updated at each decision milestone (see 2.5). If it is determined that a development is not threat-related, that fact must be demonstrated by the program sponsor in the appropriate requirement documents.

DODINST 5000.2; OPNAVINST 3811.1; NAVMATINSTS 3880.1, 3882.2

2.2.4 Studies and Analyses and Systems Engineering. Putting resources to their most productive use requires a clear understanding of (1) what is needed, (2) possible means of getting the desired results, and (3) information on the advantages and disadvantages of the alternatives. Studies and analyses and systems engineering are organized means for producing such information.

2.2.4.1 Studies and analyses. Studies and analyses are organized means for the critical examination and investigation of a subject leading to conclusions or recommendations that make

substantive contributions to planning, programming, and decision making.

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

Studies and analyses may be conducted by in-house organizations, by affiliated organizations such as the Center for Naval Analyses, or by outside organizations under contract or grant.

DODDIR 5010.22 (SECNAV 5000.23); SECNAVINST 5000.23; OPNAVINST 5000.37

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

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

MIL-STD-499A, "Engineering Management"

2.2.5 RDT&E as a Subsystem. It is the function of RDT&E to help provide capabilities needed to carry out most effectively the tasks required by the Navy's mission. The determination of future operational capabilities to be sought is not part of the RDT&E process, but rather of the overall Navy planning process as described in the preceding portions of this chapter. While it is the function of higher level planning to decide *what* capabilities ought to be attained, it is the function of RDT&E to find out what will be possible to attain and *how* to achieve those capabilities and to develop and organize the new knowledge required for their attainment. It is the function of acquisition activities to produce those capabilities. Thus RDT&E constitutes only a subsystem of the overall operational capability development system.

2.2.6 "Invention" and "Innovation." The attainment of new capabilities, which is the only justification of RDT&E effort, requires both invention and innovation. Invention is concerned with the development of new options; innovation with exploiting these options (actually developing and putting into use the capabilities those options make possible). Generally, the innovation process is many times more costly than attaining the inventions on which innovation is based.

In general, effort categorized Research (6.1) or Exploratory Development (6.2) is part of the inventive process, while that categorized Advanced Development (6.3), Engineering Development (6.4), and Operational Systems Development (6.6) is primarily innovative. The whole process of development of Integrated Logistic Support (see 2.6.1), which is so important to the attainment of an 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. In discussion and informal documents these categories are often referred to by the numbers of the categories under the DOD Programming System. The six categories and their numbers follow.

DON Budget Guidance Manual (NAVCOMPT 7102.2)

2.2.7.1 6.1 Research. 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.

2.2.7.2 6.2 Exploratory Development. Includes all effort directed toward the solution of specific military problems, short of major development projects. This type of effort may vary from fairly fundamental applied research to quite sophisticated breadboard hardware, study programming and planning efforts. It would thus include studies, investigations, and minor development effort. The dominant characteristic of this category of effort is that it be pointed toward specific military problem areas with a view toward developing and evaluating the feasibility and practicability of proposed solutions and determining their parameters. Program control of the Exploratory Development elements will normally be exercised by general level of effort.

2.2.7.3 6.3 Advanced Development. Includes all efforts directed toward projects which have moved into the development of hardware for test. The prime result of this type of effort is proof of design concept rather than the development of hardware for service use. Projects in this category have a potential military application.

2.2.7.4 6.4 Engineering Development. Includes those development programs in full-scale development for Service use 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. This area is characterized by major line item projects and program control by review of individual projects.

2.2.7.5 6.5 Management and Support. Includes research and development effort directed toward 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, as appropriate. Military construction costs directly related to a major development program will be included in the appropriate element.

2.2.7.6 Operational Systems Development. Includes those projects still in full-scale engineering development but which have received approval for production through DSARC or other action, or production funds have been included in the DOD budget submission for the budget or subsequent fiscal year. All items in this area are major line item projects which appear as RDT&E Costs of Weapon System Elements in other programs. Program control will be exercised by review of individual projects. 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 numbered 6.6xxx. All items in this area are major line item projects which appear as RDT&E Costs of Weapons Systems Elements in other programs. Program control will thus be exercised by review of the individual research and development effort in each Weapon System Element.

2.2.8 Functional View of the RDT&E Process. Figure 2-1 is a functional view of the Defense RDT&E 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 output of wet concrete.

In DOD, the functional phases represented by the first two blocks are considered generally to be concerned with the development of the "Technology Base." The Technology Base is that roughly 20 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. It includes Research, Exploratory Development, and some Advanced Development programs.

Block 1 depicts the development of the store of knowledge by research into how nature works,

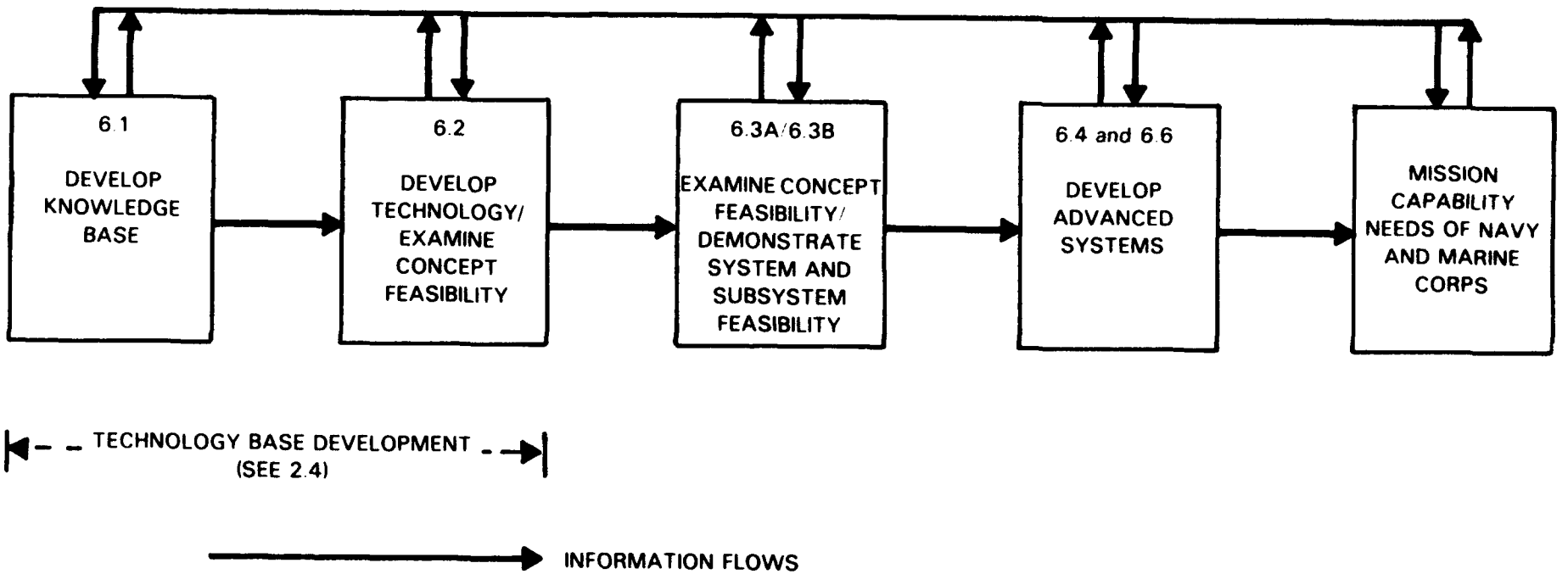

Figure 2-1. Functional View of the Defense RDT&E Process

a knowledge which is essential to the development of a new technology. Predictions concerning technological capabilities which might prove most valuable, accompanied by information on the problems of attaining them, are essential inputs into decisions on what research needs to be accomplished.

Block 2 represents the development of technologies upon which the development of advanced systems will rest. This functional phase includes Exploratory Development.

Block 3 represents some early examination of the feasibility of alternative concepts through the Advanced Technology Demonstration (6.3A) stage and the demonstration and validation phase of Advanced Development (so-called 6.3B) as the initial use of new technologies. It involves experimentally demonstrating the feasibility and cost of combining technologies into technological building blocks. This is the beginning of the innovative process. At this point the basic technology must be in hand. The major product of 6.3 effort is proof of the advantage to be gained through the application of new technology as well as a clearer recognition of the additional new technology which will be required for an advanced system.

Block 4 depicts the function of Engineering Development and Operational Systems Development (6.4/6.6). This function is one of innovation, not of invention. The new technology must have been developed through effective Research and Exploratory Development effort before it can be exploited in systems development.

In paragraph 2.2.2 above, RDT&E 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, good coupling between the stages is as vital as good research and engineering within the stages.

2.2.9 The User-Supplier Dialog. Efficient coupling requires effective performance of two roles: that of Supplier as spokesman for means, and that of User as spokesman for ends. The User is primarily 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 dialog in which the User is spokesman for "demand" and the Supplier for "supply," they hammer out the best compromise between what is desirable to have and what is possible to get.

The roles of User and Supplier are relative. One individual or organization may function as User in one relationship and as Supplier in another. For example, the Chief of Naval Material functions as User in his relationship with the Chief of Naval Research, but as Supplier in dealing with CNO. CNO in turn is the User in his dealings with CNM, but functions as Supplier in dealing with the Secretary of Defense.

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

"Need" is used by DOD in a specific sense, as set forth, for major system acquisitions, by OMB in Circular A-109. Under the Circular, when analysis of forecast missions, capabilities, technical opportunities, overall priorities and resources indicates a deficiency in existing capabilities or an opportunity to establish new capabilities, a "mission need" exists. This mission need is set forth by the Component head or by the agency staff in a "mission need statement." The mission need is submitted to and approved by the agency head as the first, necessary step in the acquisition process, which must be accomplished before resources may be committed or programs established. In DOD, for major programs, this takes the form of a "Justification for Major System New Start (JMSNS)" submitted by a Service Chief with the Service POM. Inclusion of the projection as a funded item constitutes approval by SECDEF for program initiation.

A "requirement" is generally understood to be the documentary means by which the User —

CNO/CMC — lays out to the Supplier — normally the technical establishment — a specific mission need for resolution.

In the formal User-Supplier dialog between CNO/CMC and the CNM, the User issues an Operational Requirement (OR) (see 2.5.3.3) in the case of the Navy and a Required Operational Capability (ROC) (see 2.5.9) in the case of the Marine Corps. This is done to indicate interest in a specific capability. An approved OR/ROC, with funding, fulfills the function of the JMSNS for nonmajor programs and permits program initiation, authorizing the commitment of resources required to reach the next major decision milestone. (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" are related to the relative 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 is concerned with what is worth doing, with the drive to solve problems barring attainment of needed operational capabilities.

An improved capability to project meaningful information on what is worth doing, and to inject it into the decision process in a way that does more good than harm, is being actively sought. The RDT&E management system is frequently modified, as the R&D community seeks to apply requirements pull to channel effort toward desired ends without losing the drive toward technological opportunity provided by technology push.

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

Once initial contact has been established, the subfunction of actually transferring knowledge from Supplier to User must be accomplished. It is known that effective transfer of proven technology requires much more than forwarding of documents. One aspect of this problem is the transfer of knowledge from the R&D activity to the production activity.

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 in carefully defined technical categories. A search and review of this vast amount of readily available information should be utilized to provide familiarization with any prior approaches to resolve a particular problem, or to identify approaches which may be covered by patents. The knowledge thus gained can result in cost savings by avoiding both the unnecessary expense of duplicating the prior efforts of others and possible patent infringements.

2.2.9.5 Domestic Technology Transfer Program. Technology developed under military RDT&E programs has historically made great contributions to the ability of U.S. high-technology products, such as computers and jet aircraft, to compete in world markets. The Military-Civilian Technology Transfer and Cooperative Development Program was established to strengthen the synergistic relationship between Navy RDT&E and the civilian economy. The objectives of this program are (1) to facilitate the flow of Navy-developed technology to civilian applications, and (2) to provide for cooperative development of technologies of importance to both the Department of the Navy and the civilian economy.

OPNAVINST 5700.13; NAVMATINST 5700.2

2.2.10 Weapons Life Cycle. For management purposes the life cycle of systems is divided into four program phases and, in some cases, one pre-initiation phase, with a key decision preceding each stage.

DODDIR 5000.1, DODINST 5000.2; SECNAVINST 5000.1

2.2.10.1 Advanced Technology Development (ATD). Some, but not all, programs pass

through a pre-initiation ATD phase, designed to facilitate the transfer of technology from the research and exploratory development stages into systems development. Projects selected for this phase are generally directed at the demonstration of technological innovations in a real-world environment. The ATD phase corresponds roughly to the earliest stages of Advanced Development, often referred to informally as 6.3A. The ATD phase provides candidate concepts for further development.

2.2.10.2 Concept Exploration 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 JMSNS, for major systems, or of an OR/ROC for less-than-major systems.

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 Phase is highly iterative. 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, trade-offs, etc.).
- Experimentation and test (of operational requirements, key components, critical subsystems, and marginal technology).

The outputs of the Concept Exploration Phase are alternative systems (including a preferred system) and their associated program characteristics (costs, schedules, and operational parameters) based on a combination of analyses, experiments, and test results.

The Concept Exploration Phase includes the conception of new systems (which help provide focus for Exploratory Development planning) and the program execution required to provide the technology necessary to make the concept technically feasible.

2.2.10.3 Demonstration and Validation Phase. This is the phase in which, through extensive analysis and hardware development, the principal program characteristics are validated. It is often identified with Advanced Development and referred to informally as 6.3B. It is preferred to rely on hardware development and evaluation rather than paper studies, since this provides a better definition of program characteristics, higher confidence that risks have been resolved or minimized, and greater confidence in the ultimate outcome. In an idealized case, this phase ends when a "brass board" model has been demonstrated successfully.

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, handbooks for operation and maintenance, 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 use. An essential activity of the Full-Scale Development Phase is Test and Evaluation (see Chapter 7, Appendix G), both that conducted by contractors and that conducted by the Service.

2.2.10.5 Production and 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.

2.3 PLANNING FOR RESEARCH

The birth of new technologies and the improvement of existing technology depend upon the knowledge base developed through scientific research. Research tasks evolve in a variety of ways.

DODDIR 3210.1 (ONR 3900.30); ONRINST 3910.2

2.3.1 Research of Opportunity. The need for research in a particular area may be brought out 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.

Other research is planned and conducted to meet needs for scientific information in areas clearly relevant to the mission of the Navy.

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

2.3.3 Naval Research Requirements (NRRs). The NRRs constitute the structure for planning research in science so that an adequate scientific knowledge base will be maintained. Although a time lag of 20 years or more 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.

A Naval Research Requirement (NRR) states in general terms the need for investigations and studies in the physical, engineering, environmental, and life sciences 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 is basically a Supplier-oriented document. It authorizes research in the identified areas, but does not state in performance-specification terms the results to be achieved by such research. A principal function of the NRRs is to provide a framework for programming research effort (see C3.2).

ONRINST 3910.2

2.4 PLANNING FOR DEVELOPMENT OF TECHNOLOGY

Planning for development of technology differs fundamentally from planning for systems development. The development of the technology base requires the definition of objectives, the allocation of resources among the various objectives, and establishment of policies governing their pursuit.

Objectives thus established are pursued flexibly. As in playing a bridge hand, final decision on each individual play is normally reserved until all the information from the previous play is available. Nevertheless, an overall plan of attack should be formulated carefully before play begins.

In this section the emphasis is on concepts and their documentation associated with planning for the development of technology. These documents are part of the formal User-Supplier dialog discussed in paragraph 2.2.9 above.

NAVMATINST 3910.20; MARCORPS ORDER 3900.12

2.4.1 Exploratory Development Program. Exploratory Development encompasses a major part of that work directed toward improvement and expansion of naval technological capabilities. The Navy's Exploratory Development Program develops the technological wherewithal to solve specific Navy and Marine Corps problems. The program includes analytical and experimental effort to help identify problems, to determine alternative solutions thereto in terms of prospective systems, subsystems, and techniques, and to demonstrate the technical feasibility of those solutions to a degree which warrants their consideration for support under Advanced Development. It also includes analytical and experimental work on the technologies directly related to materials, components, processes, techniques, and individual equipments of Navy and Marine Corps interest.

2.4.2 Preassessment. Planning for Exploratory Development begins early in the fiscal year with the preassessment of the program. Conducted by the Office of Naval Technology (ONT), the preassessment addresses current program content, structure, and objectives in relationship to needs and requirements expressed by CNO and CMC, as well as the coherence, technical quality, and coordination of the overall technology effort.

2.4.3 Exploratory Development Planning Documents. Planning documentation for the Exploratory Development Program is, by design, closely tied to preparation for the POM.

2.4.3.1 Technology Policy and Planning Guidance (TPPG). The TPPG, promulgated

annually in the December-January time frame, sets the focus and major thrusts of the program. It reflects the results of the ONT preassessment and initial CNO and CMC goals and directs some programming actions to be taken by claimants during the POM process.

2.4.3.2 Technology Programming and Fiscal Guidance (TPFG). The Initial TPFG (TPFG I) supplements the TPPG. In consonance with the Exploratory Development investment strategy, it specifies for each major claimant the fiscal constraints within which the POM is to be structured. The basis for the TPFG I is the DON Five-Year Defense Plan (FYDP) as modified. It is followed in late January by an updated TPFG, designated TPFG II, which is based on the January FYDP and also responds to revised CNO and CMC program and fiscal guidance and to new thrusts and goals developed in January.

2.4.3.3 Claimant Program Proposal (CPP). CPPs are submitted by the major claimants in late February to document their program proposals for the POM. The CPPs describe and prioritize the claimants' proposed program plans and funding over a five-year period, using the subproject as the basic planning unit. The CPPs provide the basic documentation which defines the DON Exploratory Development POM.

2.4.3.4 Exploratory Development Plan. The sum of the CPPs, after review, approval, and compilation by the DCNM(T), comprise the Exploratory Development Program Five-Year Plan.

2.4.3.5 Subproject Program Plan (SPP). Based upon the approved CPP, the SPP is the fundamental document by which a given exploratory development subproject is managed during execution. It describes, at the subproject level, a specific exploratory development effort to be initiated, continued, terminated, or completed. The SPP shows what is being done and why it is being done, in terms both of technical possibilities and of operational problems expected to be solved.

2.5 SYSTEMS ACQUISITION

This section discusses planning and control for all levels of systems acquisition ranging from multi-billion dollar programs to small developments.

To help the reader understand the dynamics and interrelationships of the process, Appendix J presents systems acquisition in the form of flow charts and associated descriptive paragraphs.

DODDIR 5000.1, DODINST 5000.2; SECNAVINST 5000.1; OPNAVINST 5000.42; NAVMATINSTS 5000.19, 5210.4

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 the decision authority vary with the magnitude of the program.

Acquisition programs involve an incremental, sequential process. Programs are structured and resources allocated so that demonstration of actual achievement of program objectives is the pacing function. Further, as the advancing program yields improved information, practical tradeoffs are made between system capability, cost, and schedule. Figure 2-2 depicts that process.

Figures 2-2, 2-3, and 2-4 present three perspectives of the acquisition process. The process depicted in these figures, particularly 2-4, provide the framework for the text of section 2.5. The columns of Figure 2-4 are discussed in 2.5.2 through 2.5.7.

2.5.1.1 Thresholds. The objectives for performance, operational capabilities, costs, schedule, etc. to be achieved in each phase of an acquisition are defined in terms of "thresholds". They define levels which, if not achieved (or exceeded for cost and schedule), will lead to review of the program and its possible termination or reorientation. Thresholds are defined in terms which can be verified by measurement.

DODINST 5000.2; OPNAVINST 5000.42

2.5.1.2 Acquisition Strategy. The acquisition strategy covers the objectives of the program and the plan for achieving them. For major programs the strategy must be documented

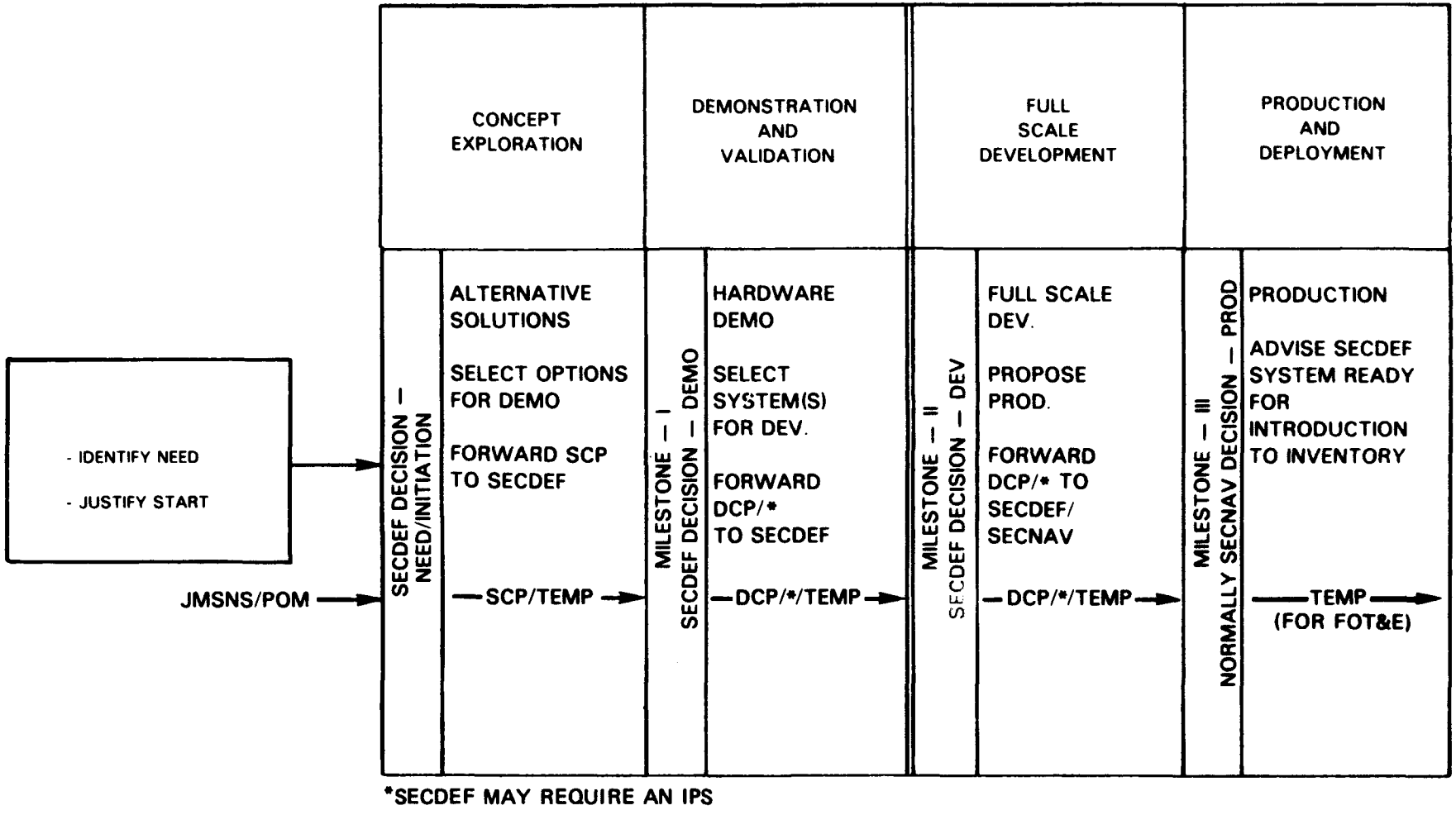

Figure 2-2. Defense Major System Acquisition Process

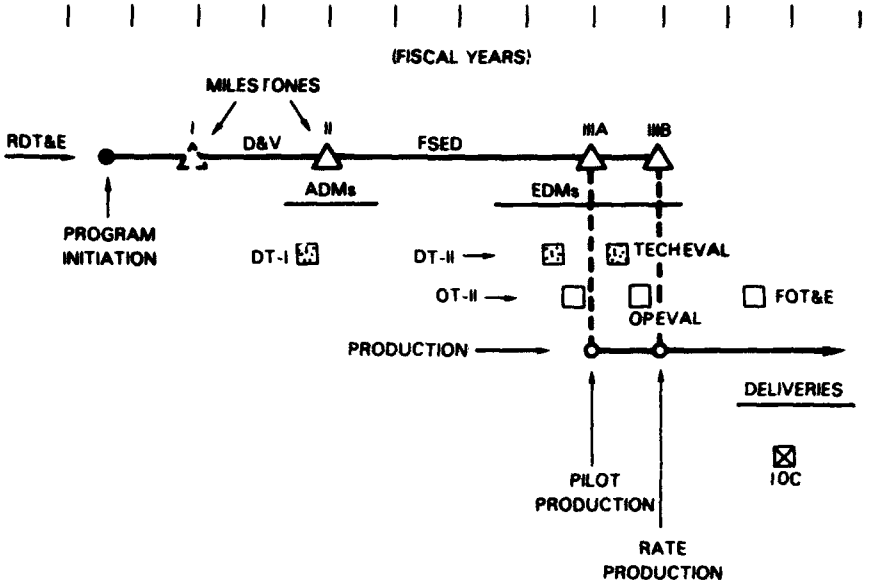

Figure 2-3. Typical Program Structure

ACAT	THRESHOLDS (RDT&E/PROD)	EVENT/ MILESTONE	PROGRAM DOCUMENT(S)	DECISION FORUM	DECISION AUTHORITY	DECISION DOCUMENT
I	200M/1B or as directed by SECDEF	Program Initiation	JMSNS	DRB	SECDEF	PDM
		MS I	SCP/TEMP	DSARC		SDDM
		MS II	DCP/IPS**/TEMP			
		MS III	DCP/TEMP	DNSARC	SECNAV (***)	SNDM
IIS	100M/500M or as directed by SECNAV	Program Initiation	OR or ROC	(None)	SECNAV	POM
		MS I/II/III	NDCP/TEMP	DNSARC		SNDM
IIC	100M/500M or as directed by CNO	Program Initiation	OR or ROC	(None)	CNO/CMC	POM
		MS I/II/III	NDCP/TEMP	CEB/ARC/SCIB OR MSARC		DADM
III	As directed by OP-098	Program Initiation	OR or ROC	(None)	DCNO/DMSO or MC counterpart	POM
		MS */II/III	TEMP	SPR OR IPR		SPRDD
IV	Other acquisitions not designated higher ACAT	Program Initiation	OR or ROC	(None)	CNM or his designee	POM
		MS */II/III	TEMP	ARB		DADM

*MS I normally eliminated for ACAT III and IV programs

**IPS may or may not be required by SECDEF

***SECDEF may make the MS III decision if thresholds not met

Figure 2-4. System Acquisition in the Department of the Navy

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.

In addition to the discussion of acquisition strategy in program control documents, CNM requires preparation of an Acquisition Strategy Paper for all programs which have a decision authority at the CNM level or higher. This document is limited to 15 pages, exclusive of appendixes.

DODDIR 5000.1, DODINST 5000.2; SECNAVINST 5000.1; OPNAVINST 5000.42; NAVMATINST 5000.29

2.5.1.3 Program Structure. Program structure defines the relationships between development phases, T&E periods, decision milestones, and production release. Normally every program document and presentation includes a program structure diagram (see Figure 2-3) which illustrates these relationships.

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

DODINST 5000.2; OPNAVINST 5000.42

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 actual achievements of pre-set thresholds, verified by T&E. T&E is covered in Chapter 7.

DODINST 5000.3; OPNAVINST 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 six months for a major program to two months for a small project.

The additional time for the large programs is accounted for largely by the sequential nature of the process where the program is reviewed by lower-level decision forums before reaching the one listed on Figure 2-4, the forum in support of the decision authority.

Preliminary activities usually include review of T&E reports, informal briefings and discussions to define and resolve issues, and revision of drafts of the program documents. If all substantive issues have been resolved through this process, the applicable Acquisition Executive 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 the production approval process to ensure that all equipment reaching the fleet—even that from the earliest production lots—meets the intended standards of performance, reliability, maintainability, and logistic supportability.

At Milestone III, the decision authority makes one of three production decisions:

- Approved for full production (AFP).
- Approved for limited production (ALP).
- Not approved for production.

OPNAVINST 5000.42; NAVMATINST 5000.19

2.5.2 Navy Acquisition Categories (ACAT). The amount of high level attention, exten of documentation and degree of formality in carrying out the acquisition proces are a function of the program's ACAT level as depicted in Figure 2-4.

SECNAVINST 5000.1; OPNAVINST 5000.42

2.5.2.1 ACAT I. ACAT I includes programs with estimated RDT&E costs in excess of $200 million or production costs in excess of $1 billion (FY 1980 $) and such other programs as SECDEF designates. SECDEF is the decision authority.

2.5.2.2 ACAT II. This category includes programs below the ACAT I level whose total costs are expected to exceed $100 million RDT&E, and/or $500 million for procurement (FY 1980 $), and such other programs as the decision authority designates. ACAT II includes, IIS for which SECNAV is the decision authority, and IIC where CNO or CMC is the decision authority.

2.5.2.3 ACAT III. ACAT III includes programs below the ACAT II level so designated by CNO/CMC. Decision authority is the resource sponsor. Programs are designated in this category if they affect the military characteristics of ships or aircraft, directly affect the Navy's combat capability, or could be expected to interact with the enemy.

2.5.2.4 ACAT IV. ACAT IV includes programs not in a higher category. CNM or his designee is the decision authority.

2.5.3 Program Initiation. Procedures for starting RDT&E/acquisition programs are designed to put maximum emphasis on early determination of affordability and to ensure that the initiation process is tightly controlled by high-level decision makers. (See Appendix J steps 1-9.) Success in the program initiation process results in inclusion of the program in the POM based on approval of an OR or JMSNS. These and preceeding documents are discussed below.

DODDIR 5000.1, DODINST 5000.2; SECNAVINST 5000.1; OPNAVINST 5000.42

2.5.3.1 Tentative Operational Requirement (TOR). When the need for a new system is perceived and is believed to be affordable, OPNAV transmits a TOR to NAVMAT describing the desired capability in general terms. The TOR is a request to the CNM for formulation and submission of a Development Options Paper.

2.5.3.2 Development Options Paper (DOP). CNM forwards the TOR to the appropriate syscom or CNM-designated PM where options are explored and a DOP prepared. The DOP outlines a menu of alternatives ranging from austere to advanced systems of great capability and cost, with later IOCs. Options may be presented as a series of system alternatives or in the form of cost-capability curves for key system parameters. The CNM-approved DOP is forwarded to OPNAV.

2.5.3.3 Operational Requirement (OR). OPNAV's selection of the system to be pursued is documented in an OR (or JMSNS for an ACAT I program). Issuance of the OR (or JMSNS) documents firm commitment by the OPNAV resource sponsor to support the resulting program in the POM and budget process.

2.5.3.4 Marine Corps Required Operational Capability (ROC). (See discussion of the ROC in 2.5.9 below.)

2.5.3.5 Justification for Major System New Start (JMSNS). Limited to three pages, the JMSNS provides concise statements of:

- Defense Guidance element to which system responds.
- Mission area, role of the system within the area, and threat.
- *Alternative concepts.*
- Technology involved.
- Funding implications.
- Constraints.
- Acquisition strategy.

The JMSNS is submitted by the Service with its Program Objectives Memorandum (see 3.3.10). Approval of inclusion in the POM by the SECDEF's Program Decision Memorandum provides official sanction of the new start and authorizes the Service to initiate the next program phase.

DODDIR 5000.1, DODINST 5000.2

2.5.4 Decision Milestones. Essential high-level control of the acquisition process is accomplished through go/no-go decision by the decision authority at key program transition points, or "milestones." Milestone decisions are

made by the decision authority with particular emphasis on test results.

When a program has progressed so that it is ready for transition to the next phase, appropriate documentation is prepared or updated and a request to proceed with the next program phase is submitted to the cognizant acquisition executive.

The milestone decision (except for the final Milestone III) includes thresholds and other criteria to be satisfied by the next milestone. These conditions to be met are set forth in the decision document.

For a graphic presentation of the milestone decision process, see Appendix J, steps 10-15.

DODDIR 5000.1; SECNAVINST 5000.1; OPNAVINST 5000.42

2.5.4.1 Milestones I — Demonstration and Validation (D&V). The Milestone I decision is a validation of the requirement, based upon preliminary evaluation of concepts, costs, schedule, readines objectives, and affordability. It provides authority to proceed with the demonstration and validation phase and to develop the system sufficiently to support a Milestone II decision. A review of the acquisition strategy may be substituted for a formal Milestone I review for those programs not requiring a discrete demonstration and validation phase.

For all programs, a major consideration at the time of Milestone I is the provision of adequate RDT&E funding prior to Milestone II for sound technical work and in-depth design and engineering. For ACAT III and IV programs, Milestone I will normally be eliminated.

2.5.4.2 Milestone II — Full-Scale Engineering Development (FSED). Milestone II decision authorizes entry into full-scale engineering development. For most programs, pilot production will occur during this phase. It is the single most critical decision point as it constitutes a firm commitment to the program. Milestone II approval is based on demonstration that:

- Engineering efforts, rather than experimental work, are now required.
- The best technical and support approaches have been selected.
- Technical and operational risks have been reduced to acceptable levels.
- The cost-effectiveness of the proposed system is favorable in relation to competing items, Navy-wide; and that the cost of development, production, deployment, operation, and support is affordable even if overall Navy budget levels are significantly reduced.
- The technology needed is at hand.

2.5.4.3 Milestone III — Production. At this point, transition to production will be authorized. Operational suitability, including logistic supportability, is a major factor in the production decision. SECDEF normally delegates Milestone III decision(s) to SECNAV for ACAT I programs where thresholds are met.

For large programs, "transition to production" is more of a phase than a single point and involves multiple Milestone III decisions, e.g. IIIA for limited production, IIIB for rate production. (See 2.5.1.6 on "approval for production.")

2.5.4.4 Other Decisions. Events external or internal to a program, such as Congressional funding action or threatened breach of a threshold, may require a program review and decision by the applicable decision authority in addition to the milestone decisions.

2.5.5 Program Documents. Program documents support milestone decisions and when approved, constitute a "contract" between the decision authority and the program manager concerning management of the program.

While the maximum length of the documents varies by a factor of six or more, they typically address the same issues: program rationale, expected benefits from successful development, expected costs, risks, acquisition strategy, and thresholds. Annexes typically include a program structure diagram (see Figure 2-3), thresholds, and funding requirements and profile.

2.5.5.1 System Concept Paper (SCP). An SCP is required for the Milestone I decision

for ACAT I programs. The SCP identifies program alternatives based upon initial studies and analyses of design concepts; alternative acquisition strategies; expected operational capabilities; industrial-base capacity; readiness, support, and personnel requirements; and cost estimates. It is constrained to 12 pages.

DODDIR 5000.1, DODINST 5000.2

2.5.5.2 Decision Coordinating Paper (DCP). DCPs are prepared for SECDEF's Milestone II decision for ACAT I programs, and are updated for the Milestone III decision. The SCP and DCP are similar in content and outline. The DCP is limited to 18 pages. The additional length of the DCP is accounted for by expanded discussion of the description of the selected alternative and technological risks.

DODDIR 5000.1, DODINST 5000.2

2.5.5.3 Integrated Program Summary (IPS). The IPS amplifies information in the DCP. The DAE (see 1.2.4) may require submission of an IPS if he believes the DCP does not provide sufficient information for consideration by the DSARC.

DODDIR 5000.1, DODINST 5000.2

2.5.5.4 Navy Decision Coordinating paper (NDCP). The NDCP is the control document for ACAT II programs. Similar in content and function to the SCP/DCP, it is constrained to 3 pages exclusive of the cover page and annexes.

SECNAVINST 5000.1

2.5.5.5 T&E Master Plan (TEMP). A TEMP is required for all milestone decisions for all programs. For ACAT III and IV programs, the TEMP is the single document by which the program is controlled. (See 7.5.3.)

DODDIR 5000.3; OPNAVINST 3960.10

2.5.6 Decision Forums. In preparation for milestone decisions, the control documents or document are reviewed by a group which makes recommendations to the decision authority. Membership includes officials and representatives of organizations with a vital interest in the program. The size of the group and level of the members varies with the ACAT level of the program.

2.5.6.1 Defense Resources Board (DRB). The DRB helps SECDEF manage the entire planning, programming, and budgeting process, including initiation of major acquisition programs. Chaired by DEPSECDEF, members include Chairman JCS; Secretaries of the Army, Navy, and Air Force; Undersecretaries of Defense (P) and (R&E); ASDs (R&E), (HA), (MRA&L), (PA&E), (C), (ISP); and the Associate Director of the OMB. (See also E9.6.)

2.5.6.2 Defense Systems Acquisition Review Council (DSARC). The Defense Systems Acquisition Review Council (DSARC) is chaired by the USDRE, as Defense Acquisition Executive (DAE) (see 1.2.4). Its membership includes the Under Secretary of Defense for Policy; the Assistant Secretaries of Defense (Comptroller) and (Manpower, Reserve Affairs and Logistics); each Service Secretary for major acquisitions involving his department; the Director, Program Analysis and Evaluation; and the Chairman of the JCS or a representative designated by the CJCS.

The DSARC permanent advisors are: Deputy under Secretaries of Defense (Strategic and Theater Nuclear Forces), (Tactical Warfare Programs), (Communications, Command, Control and Intelligence), and (Acquisition Management); Director, DIA; DDTE; Chairman of the Cost Analysis and Improvement Group; and the Director, Weapons Support Improvement Group (WSIG).

Administrative duties are carried out by the Executive Secretary, for DSARC matters in general, and by a DOD action officer, for each major system. Both are appointed by the DAE. (See E9.2.)

DODDIR 5000.1; DODINST 5000.2

2.5.6.3 Department of the Navy Systems Acquisition Review Council (DNSARC). The DNSARC provides a formal mechanism by which the SECNAV reviews and appraises weapon systems acquisition programs. It also

provides a review forum for review of weapon systems acquisition presentations to be made to the Office of the Secretary of Defense. DNSARC members are the Assistant Secretaries; the General Counsel; Director, Office of Program Appraisal; the Chief of Naval Operations; the Commandant of the Marine Corps; and the Chief of Naval Material. The chairman for all ACAT IIS programs is the Navy Acquisition Executive (NAE) (see 1.4.4). For ACAT I programs the NAE normally chairs the DNSARC unless SECNAV elects to chair or to delegate the chair to the Under Secretary of the Navy. (See E9.7.)

SECNAVINST 5000.1

2.5.6.4 CNO Executive Board (CEB). The primary mission of the CEB is to consider decision alternatives on all major acquisition programs prior to review by SECNAV and SECDEF. The CEB also advises CNO on other matters. Members are CNO, VCNO, CNM, and OP-090 (Director, Navy Program Planning). CMC is an associate members. In addition to the permanent and associate members, ad hoc members participate as required. (See E.9.5.)

OPNAVINST 5420.2

2.5.6.4.1 Acquisition Review Committee (ARC). The ARC is a sub-panel of the CEB. The ARC monitors ACAT IIC programs. In addition to monitoring ACAT IIC programs, the ARC reviews all programs (except ship programs) likely to lead to major systems acquisitions or require costly R&D. Members are OP-090 (Chairman), OP-095, OP-098, OP-01, and OP-04. (See E9.5.2.)

2.5.6.4.2 Ship Characteristics and Improvement Board (SCIB). The SCIB, a sub-panel of the CEB, performs the functions of the ARC for ship acquisition programs. Permanent members are OP-03 (Chairman), OP-090, OP-095, OP-02, OP-04, OP-05, and COMNAVSEA. (See E95.1.)

2.5.6.5 Sponsor's Program Review (SPR). A "mini-CEB," the SPR is the forum for making MS II and III decisions for ACAT III programs. Regular SPR participants include OP-090, OP-095, OP-098, OP-01, OP-04, CNM, COMOPTEVFOR, and the appropriate systems commander. Ad hoc members participate as appropriate. The SPR is chaired by the resource sponsor.

OPNAVINST 5000.42

2.5.6.6 Acquisition Review Board (ARB). ARBs review all programs for the cognizant system commanders. They are chaired by SYSCOM officials depending on the level of the program — the SYSCOM Commander or Vice Commander for ACAT I or II programs. The ARB is the decision forum for ACAT IV programs. (See E9.8.)

NAVMATINST 5000.19

2.5.6.7 Marine Corps Systems Acquisition Review Council (MSARC). The MSARC, a board of general officers chaired by the Assistant Commdandant of the Marine Corps (ACMC), reviews major Marine Corps acquisition programs at milestone decision points and makes recommendations to CMC. For lesser programs there is an In-Progress Review (IPR) chaired by the Chief of Staff. (See E9.4.)

MCO P5000.10

2.5.7 Decision Documents. Decision documents record decisions of the decision authority at program initiation and milestone decision points. The major decision document is the POM since the central program issue is whether or not to fund and at what level. However the funding decision is amplified by a decision memorandum.

2.5.7.1 Secretary of Defense Decision Memorandum (SDDM). In the SDDM, SECDEF documents his decision, establishes program goals and thresholds, reaffirms established needs and program objectives, authorizes any exceptions to acquisition policy, and provides direction and guidance to OSD, OJCS, and the DON for the next phase of the acquisition.

DODDIR 5000.1, DODINST 5000.2

2.5.7.2 SECNAV Decision Memorandum (SNDM). Program decisions by SECNAV are documented in SNDMs. The SNDM is analogous to the SDDM.

SECNAVINST 5000.1

2.5.7.3 Sponsor's Program Review Decision Document (SPRDD). Milestone decisions by the DCNO/DMSO or Marine Corps counterpart of the Program Sponsor for ACAT III programs are recorded in an SPRDD.

OPNAVINST 5000.42

2.5.7.4 Decision Authority Decision Memorandum (DADM). DADM is a generic term denoting the document used to record program decisions of various decision authorities for milestone decisions. These documents are analogous to the SDDM and SNDM. Acquisition Decision Memorandum (ADM) are used to document program decisions by Marine Corps decision authorities.

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

Top Level Requirements (TLR) and Top Level Specifications (TLS) evolve through an iterative process as the ship design progresses. Requirements are not finally frozen until late in the design process, when the feasibility and cost of meeting various levels of performance have been established with a high level of confidence.

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

OPNAVINST 9010.300

2.5.9 Documentation of Marine Corps Requirements. Marine Corps Science and Technology Objectives (STOs) have two principal purposes: (1) to describe new capabilities needed and (2) to provide scientific and technical solutions to the problems of implementing the concepts and operational capabilities enunciated in the Marine Corps Long-Range Study and Marine Corps Long-Range Plan (MLRP) from which, for the most part, they are generated.

The Required Operational Capability (ROC) is used to document a requirement for a system to be developed specifically to meet a Marine Corps need (as distinguished from Marine Corps adoption of material developed to meet the needs of the developing Service). The ROC is a brief statement of a specific operational capability which 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 that will lead to an improved capability or to the elimination of a cited deficiency. The document will be refined as required during the development process; however, the basic statement of need will normally not change unless the threat, operational concept, or the cited deficiency changes. The ROC solicits from the development community (Chief of Naval Material or other appropriate Service agency) development proposal wherein alternatives and tradeoffs are considered. (see 2.5.3).

Much Marine Corps material is developed by other Services, particularly the Army. In such cases, the requirement documents of the developing Services are used, with the addition of a Marine Corps covering letter. The Navy OR and other Service requirement documents, when produced to cover Marine Corps needs, and the ROC are drafted by CG, MCDEC.

MARINE CORPS ORDERS 3900.4, P5000.10

2.6 PLANNING FOR SUPPORT

DODDIRS 5000.1, 5000.39 (SECNAV 5000.39); SECNAVINSTS 5000.1, 5000.39; NAVMATINST 4000.20;

2.6.1 Integrated Logistic Support (ILS) Concept. Integrated Logistic Support is a concept for developing several important aspects of the military capability system as an integrated and balanced whole.

ILS is not a thing apart but an aspect of the integrated planning and development of a capability system. Within this framework, the objective

of ILS planning is to *influence design* of the hardware itself. The real payoff comes when considerations of maintainability, reliability, and general supportability actually are appropriately weighed in the tens of thousands of decisions made in the planning and development stage, all of which determine the character of the resulting system.

The elements of logistic support, the development of which must be planned in a coherent and integrated manner, are:

- The maintenance plan.
- Support and test equipment.
- Supply support.
- Transportation and handling.
- Technical data.
- Facilities.
- Personnel and training.
- Logistic support resource funds.
- Logistic support management information.

2.6.2 New Facilities Incidental to RDT&E Effort. Construction of new facilities required in support of 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 facilities to support RDT&E effort must be anticipated long in advance, and timely measures taken to meet the requirements for obtaining funds through the MILCON appropriation.

DODINST 7040.4 (SECNAV 7045.9)

2.6.3 Personnel. Personnel necessary for the development or deployment of a new system are a special planning problem owing to the leadtimes involved. Often the training of personnel may take longer than development and production of the hardware they are to operate.

In addition to the leadtime required for training, advance preparation is necessary because of the controls involved. All personnel levels are tightly controlled within the framework of the Five-Year Defense Program. Thus requirements must be anticipated long in advance and the necessary measures taken to secure timely authorizations through the programming system.

OPNAVINST 1500.8

2.7 COST CONSIDERATIONS

It is the inherent obligation of overall Defense management to provide the highest mission capability possible within the limits of the resources the country chooses to allocate to its Defense. As DOD Directive 5000.1 states,

> 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 concepts, policies, and institutional arrangements related to cost considerations in the RDT&E and acquisition of mission effective, cost-effective, and affordable weapons.

DODINSTS 4245.3, 7000.3 (SECNAV 7700.5), 7041.3 (SECNAV 7000.14 and OPNAV 7000.18); DODDIRS 5000.1, 5000.4 (SECNAV 7000.19); SECNAVINSTS 7000.14, 7000.19, 7700.5; OPNAVINST 7000.17, 7000.18; NAVMATINST 7000.19; DON Programming Manual

2.7.1 Economic Analysis. Economic analysis is a means of systematically considering benefit and cost in decisions, particularly investment decisions. In conducting economic analysis, objectives and alternatives are searched out and compared in the light of their benefits and costs through the use of an appropriate analytical framework.

Economic analysis is required in support of the acquisition of major systems. The results of this analysis are summarized in the DCP (for major systems) 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 are established to reflect the cost of acquisition and ownership. Discrete cost projection elements (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 with the same rigor as applied to technical requirements. 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 the capability to estimate the probable cost of developing, procuring, operating, and supporting proposed weapon systems. Cost estimating dominates every phase of Navy planning, programming, and budgeting. The cost of development and acquisition, along with recurring costs of ownership, must be estimated accurately if realistic Navy programming and wise decision making are to result.

2.7.3.1 Cost analysis responsibilities. Cost estimates for a proposed development program are prepared by the Principal Developing Activity (PDA) within CNM. Independent cost estimates are made by the Director of Navy Program Planning (OP-090) within OPNAV before initiation of the DSARC process. The DOD Cost Analysis Improvement Group (CAIG) then provides the DSARC with a review and evaluation of both the program cost estimates prepared within NAVMAT and the independent estimate prepared by OPNAV.

2.7.3.2 Costing methodologies. Two basic approaches to estimating costs are (1) to work from detailed estimates of the cost of work packages to derive the overall estimate, or (2) to start from the overall characteristics of the system and estimate probable cost by deduction.

Under the detailed estimating approach, the elements of the system and the work required to develop, acquire, operate, and support them are identified in considerable detail. These cost elements are based on the Work Breakdown Structure (WBS) of MIL-STD-881. With the elements identified, total program cost is estimated by adding the costs of the individual work packages and adding appropriate burden (overhead) figures.

Parametric costing, on the other hand, starts with the overall characteristics of the system — size, complexity, performance level sought — to estimate the cost of a new system. For example, from historical information on the cost of developing past aircraft and their weight, a gross estimate can be made of the probable cost of developing a new 50,000-pound fighter.

2.7.3.3 Classes of baseline cost estimates. Many so-called "cost overruns" are the result of comparing the actual cost of developing a system against early 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." Descriptions of these estimates are in Appendix C, Section C2.

Technically, the term "cost overrun" denotes the difference between actual cost experienced and the estimated cost included in a contract.

"Cost growth," a more generic term, refers to the net change of current estimates over a base figure previously established. Thus changes in estimates of the total cost of the program, made as the program progresses, should properly be termed cost growth rather than, as they often are, cost overruns.

2.7.3.4 Standard weapon system costs. In the past, considerable confusion has resulted from the release of estimates of the cost of weapon systems which were based on different cost elements. To eliminate this confusion, standard definitions were prescribed for the terms "Flyaway Cost," "Weapon System Cost," "Procurement Cost," and "Program Acquisition Cost." Definitions of these terms are in Appendix C, Section C8.

2.7.3.5 Navy Cost Information System (NCIS). NCIS is essentially a data bank, designed to provide and display Navy program and cost information in a variety of reports expressed in either appropriation structure or DOD programming structure, using computerized automatic data processing.

2.7.3.6 Life cycle cost (LCC). Life cycle cost is the total cost to the government for the development, acquisition, operation and logistic support of a system over a defined life span.

Life-cycle-cost estimates are an inherent part of economic analysis and are thus required for all major RDT&E programs. (See discussion of economic analysis in paragraph 2.7.1 and related references.)

2.7.4 Incremental Acquisition Strategy. Even with the ultimate in ability to project the true cost of RDT&E programs, there is still great uncertainty associated with the technical performance which can be achieved, how long it will take to achieve that performance, how much it will cost, and the value of the related operational capabilities once they become available. Thus it is policy to pursue development programs through an incremental, sequential strategy under which program decisions on further work are made on the basis of successful passing of achievement milestones. Programs are structured and resources allocated so that demonstration of actual achievement of program 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 is also practiced by the Congress which requires submission of the latest test results along with requests for funds for procurement of weapons. (See G1 of Appendix G for excerpts from sections of Chapter 4 of Title 10, U.S. Code which establish this requirement.)

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 to meet needs of top management in the Office of the Secretary of Defense and for OSD to furnish information to the Congress and the GAO.

Submitted quarterly, SARs include retrospective information on costs, schedule and technical achievement, and "current estimates" of operational/technical characteristics of the resulting system, as well as when it is likely to be available and its probable cost.

Other reports dealing with measurement and reporting of cost experience are discussed in 6.7.4, "Cost Reports."

SELECTED REFERENCES ON R&D PLANNING

DODDIR 5000.1, "Major System Acquisitions," establishes fundamental overall policy for systems development and acquisition. The management principles in the directive are applicable to all programs.

DODINST 5000.2, "Major System Acquisition Procedures."

DODDIR 5000.3, "Test and Evaluation."

SECNAVINST 5000.1, "System Acquisition," sets forth policies and procedures for all Navy acquisitions.

SECNAVINST 5000.39 promulgates DODDIR 5000.39, both entitled "Development of Integrated Logistic Support 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.

OPNAVINST 5000.42, "RDT&E/Acquisition Procedures," prescribes RDT&E/acquisition procedures in amplification of policies in DOD 5000.1,

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

NAVMATINST 3910.20, "Exploratory Development Program Management Manual."

ONRINST 3910.2, "Naval Research Requirements and the Naval Research Program Structure."

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

JCSM-70-73, "JCS Strategic Planning System."

CHAPTER 3 PROGRAMMING FOR RDT&E

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CHAPTER 3
PROGRAMMING FOR RDT&E

This chapter deals with the decision process by which plans are converted into time-phased and fiscally oriented programs. Programming is the portion of the Planning, Programming, and Budgeting System (PPBS) which links planning to budgeting. The Department of the Navy Programming System is the normal process within which CNO, CMC, SECNAV, and SECDEF make decisions on modernization, force levels, readiness, and sustainability. The heart of the chapter is the flow chart presentation of the PPBS process in section 3.4.

Understanding the DOD Programming System and its objectives and implications is particularly important to RDT&E managers because, before any system development can be initiated, it first must be approved, programmed, and funded. To gain approval and funding, a program must stand up to "survival of the fittest" competition against alternative means of accomplishing the same purposes and alternative uses of the same resources.

3.1 OBJECTIVES OF THE DOD PROGRAMMING SYSTEM

- To relate resources to Defense missions and requirements. This is accomplished by identifying the resource "inputs" — men, material, and services — required for military "outputs."
- To link planning to budgeting.
- To establish programs around missions rather than military departmental lines.
- To provide a framework within which Services and organizations can compete to provide the forces required for missions.
- To establish a rational program structure which encompasses all Defense activities.
- To provide a capability for making cost-effectiveness studies of alternative force structures or weapons systems.
- To appraise programs on a continuing basis.
- To establish a single channel for major decisions on Defense programs.

3.2 DESCRIPTION OF DOD FIVE-YEAR DEFENSE PROGRAM (FYDP)

The FYDP is the summation of the programs of the Department of Defense components at a point in time. It relates manpower and fiscal inputs with military outputs or programs. It displays what has been accomplished in the past and what is planned to be accomplished in the future to support national strategy decisions. The FYDP displays the manpower, dollars, and forces for programs from the beginning of the PPBS system in fiscal year 1962, through the current year, plus five additional years.

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*Department of the Navy Programming Manual. The DON Programming Manual is the standard reference publication for operation of the DOD PPBS in the Department of the Navy.**

3.2.1 Program Element. The program element is the basic building block of the Five-Year Defense Program. It describes the mission to be undertaken, identifies the organizational entities who will perform the mission assignment, and estimates costs. There are roughly 800 program elements in the entire FYDP and 400 Navy program

*For additional information on subjects discussed in this Guide, consult the listed references. Titles, current editions, and promulgation dates of directives on which this edition is based can be found in the Master Reference List following the appendixes. When a DOD directive has been promulgated as an enclosure to a Navy directive, the promulgating directive is shown in parentheses following the DOD listing.

elements, of which about 300 are for RDT&E. (See C7.2 and Figure C-3.)

The DOD Program Structure Codes and Definitions Handbook (DOD 7045.7-H) promulgates the official DOD definition for each program element. Appendix A of the DON Programming Manual lists all Department of the Navy program elements.

3.2.2 Program. A DOD program is a combination of program elements designed for the accomplishment of a definite objective or plan which is specific as to the time phasing of what is to be done and the means proposed for its accomplishment. Program elements in a single program either complement each other or are possible substitutes for one another.

In understanding the system, it is important to distinguish between the meaning of "program," as used in the PPBS system described here, and the term's use to refer to an acquisition. For the latter usage, refer to the discussion of the Navy Acquisition Categories in 2.5.2.

3.2.3 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

9 Administration and Associated Activities

0 Support of Other Nations.

3.3 DOCUMENTS USED IN UPDATING THE FYDP AND THE DNFYP

This section is concerned with the documents through which the decisions of the Secretary of Defense are incorporated into the computerized data bases which constitute the FYDP and the DNFYP.

The Services and Defense Agencies submit program objective memoranda and budgets, to which the Secretary of Defense responds. A number of formal documents used in the process are discussed below.

DODINST 7045.7 (SECNAV 5000.16); DON Programming Manual

3.3.1 Defense Guidance (DG). The DG provides the definitive policy, strategy, force planning, resource planning, and fiscal guidance upon which all Defense planning and programming are based. It also includes threat and opportunity assessments and statements of issues requiring further study or top management attention. Development of the DG begins in August with consultation among the SECDEF, Unified and Specified Commanders, and JCS and with submission by the JCS of the JSPD (see 3.3.2). It is developed through a number of iterations under the oversight of the Defense Resources Board (DRB) and management of USD(P), with consultation and comment as appropriate by DOD components, JCS, National Security Council, Department of State, and Office of Management and Budget. The DG is published in early January.

3.3.2 Joint Strategic Planning Document (JSPD). The JSPD is submitted for use in developing the DG. It contains a comprehensive military appraisal of the worldwide threat to U.S. interests and objectives and a statement of recommended military objectives and strategy to attain national objectives. A summary of JCS planning force levels that could with reasonable assurance execute the military strategy is included, as well as views on the attainability of these forces in consideration of fiscal, manpower, material, technology, and industrial capacity considerations. The JSPD also provides an appraisal of the capabilities and risks associated with programmed force levels and recommends changes to force planning and programming guidance where appropriate.

3.3.3 Department of the Navy Policy and Planning Guidance (DNPPG). The DNPPG

comprises an overall statement of Department of the Navy goals and planning objectives in specific relationship to national strategic requirements. It serves primarily to establish a DON orientation with regard to the broad range of issues. The DNPPG is written from the intermediate-range perspective and serves as a significant means of injecting Navy influence into the formulation of the Defense Guidance.

3.3.4 CNO Policy and Planning Guidance (CPPG). The CPPG provides basic concepts, objectives, and assumptions on which the Department of the Navy Five-Year Program is to be based. In effect, the CPPG presents the strategy to be used as a guide in formulating programs in the annual planning cycle. The CPPG is organized into four sections: (1) the essence of SECDEF's Defense Guidance as it pertains to the Navy, (2) CNO's views on strategic objectives, (3) specific CNO objectives, and (4) broad guidance for POM development including guidance for the CNO Program Analysis Memoranda (CPAM).

3.3.5 CNO Program Analysis Memorandum (CPAM). Based on the higher level policy guidance set forth in the CPPG, the CPAM provides more detailed guidance for development of the POM. The CPAM addresses these eight areas: Strategic; Sea Control; Tactical Air; Amphibious; Support and Mobility; Command, Support and Logistics; Manpower and Training; and Naval Reserve Forces. Finally, a summary CPAM is developed which integrates the issues examined in the individual mission areas and leads to an overall set of Navy program alternatives.

A central feature of the CPAM is the use of overall resource constraints, specified in the CPPG, in the underlying analyses. Each individual CPAM describes the current Five-Year Defense Program (FYDP), identifies Navy issues, and develops alternatives based on the decrement and increment levels specified in the CPPG. The CPAMs are then reviewed by the CNO Executive Board (CEB), and the impact of these alternatives on the CNO's objectives is identified.

Individual CPAMs are published in draft and reviewed by the CEB annually in the second quarter of the fiscal year. After review, the summary CPAM is developed and reviewed by the CEB in order to provide the CNO with a set of alternatives, in priority order, for responding to SECDEF's Defense Guidance.

3.3.6 CNO Program and Fiscal Guidance (CPFG). The CPFG is issued in February after the Warfare Appraisals and CPAMs and after publication of the annual Defense Guidance (DG). It documents CNO's decisions regarding priorities and balance after completion of the DON planning process and contains groundrules for development of the POM. The CPFG includes fiscal and manpower controls and provides general and specific guidance for preparation of Sponsor Program Proposals (SPPs).

3.3.7 Sponsor Program Proposals (SPPs). SPPs present the proposals of Resource Sponsors for programs responsive to the CPFG.

3.3.8 Program Assessments. The proposed program of the Resource Sponsors as documented in the SPPs is analyzed from various perspectives—warfighting capability; research, development, and acquisition; manpower, etc.

POM 87-1

3.3.9 Program Evaluation Summary (PES). The PES presents the result of program assessments to the CNO. It is reviewed by the PDRC and presented in early April to the CNO Executive Board (CEB) for CNO decision. A separate briefing on the proposed POM and major issues is subsequently conducted for SECNAV.

3.3.10 Department of the Navy Program Objectives Memorandum (POM). The POM is the document in which each military department and Defense Agency recommends and describes annually its total program objectives within DOD-specified resource constraints. Program objectives are fiscally constrained. The POM includes all Department of the Navy programs. It provides all Department of the Navy with the force level objectives that have been approved by the Secretary of the Navy which are projected eight years (commencing two years after the fiscal year in which approved). The resource levels are projected five years (personnel, procurement, research and development, and supporting programs). To allow flexibility for each Service to develop balanced programs, allocation of funds is permitted between various categories and

appropriations, unless specifically stated otherwise in SECDEF's Defense Guidance. The POM is prepared annually and submitted to the Secretary of Defense in May. The JCS comment on the POMs of the military departments in the JPAM (see 3.3.11).

3.3.10.1 Management Information Paper (MIP). The MIP, a back-up document for the POM, is a one-page summary of information about a program element (for Research (6.1) and Exploratory Development (6.2)) or a project within a program element (for Advanced (6.3) and Engineering (6.4) Development, Management and Support (6.5), and Operational System Development (6.6)). The summary includes purpose/description, program status through the current fiscal year (CFY), significant problems, planned program for CFY+1 and CFY+2, planned program to completion, RDT&E and procurement funding details, and production unit cost/quantity. The MIP is submitted to OP-098 in November (by SYSCOMs/PMs/HQNAVMAT and others) in support of POM preparation within OPNAV, and to the Office of the Secretary of Defense (OSD) in May, supporting the POM. In an updated version, the MIP is submitted to OP-098 in July/August and, in September, to OSD to support Navy Budget submission. It is an internal and external Navy document which is used in fulfillment of various information requirements. Instructions for MIP timing and preparation are promulgated twice each year by OP-098 (OP-980).

3.3.10.2 Extended Planning Annex (EPA). The EPA is an annex to the POM which extends POM policies and programs into the future. It extends procurement funding ten years and Fleet force levels thirteen years beyond the POM. Development of the EPA is based on guidance from OSD. Sponsor inputs to the EPA constitute a rationale for forces, modernization programs, and proposed new systems projected over the EPA period. The EPA is used in OSD to understand where the POM leads and as an input to planning for the next cycle.

3.3.11 Joint Program Assessment Memorandum (JPAM). The JPAM provides a risk assessment based on the composite of the force recommendations of the Services' Program Objectives Memoranda (POMs) and includes the views of the JCS on the balance and capabilities of the POM forces and support levels. Where appropriate, the JCS recommends actions to improve defense capabilities. In addition, JPAM develops SALT-constrained forces and provides recommendations on nuclear weapon stockpiles and on the security assistance program.

3.3.12 Program Decision Memorandum (PDM). PDMs record the decisions of the Secretary of Defense on POMs.

3.4 PROGRAM CHANGE PROCESS

This section looks at the program change process from the perspective of management. It is concerned with the process by which the DNFYP is normally updated and extended for an additional year.

DODINST 7045.7 (SECNAV 5000.16); SECNAVINST 5000.16; DON Programming Manual

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Section 3.4 presents the PPBS process in the form of flow charts and facing page descriptive paragraphs (step statements). The flow charts and associated step statements identify officials and special groups, documents, and the review and approval process. Sources of information in this Guide are referenced within the step statements.

The steps outlined below culminate in the budget for the year which begins 1 October 1986 and ends 30 September 1987, i.e. FY 87. The events shown started in August 1984 and end in January 1986 with submission of the FY 87 budget to the Congress. Justification of the budget before Congressional Committees is addressed in section 4.8 of the next chapter. When appropriate, a NOTE has been added to the end of certain descriptive paragraphs to indicate that there are options to the actions called for in that paragraph or to provide some other insight into the action described.

The charts necessarily show the process as a progression of the major steps as it proceeds 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. As shown in Fig. 3-1, the budgets for three fiscal years are always simultaneously in work at different stages of the cycle. Iterative information flows continuously in both directions, both within and between cycles.

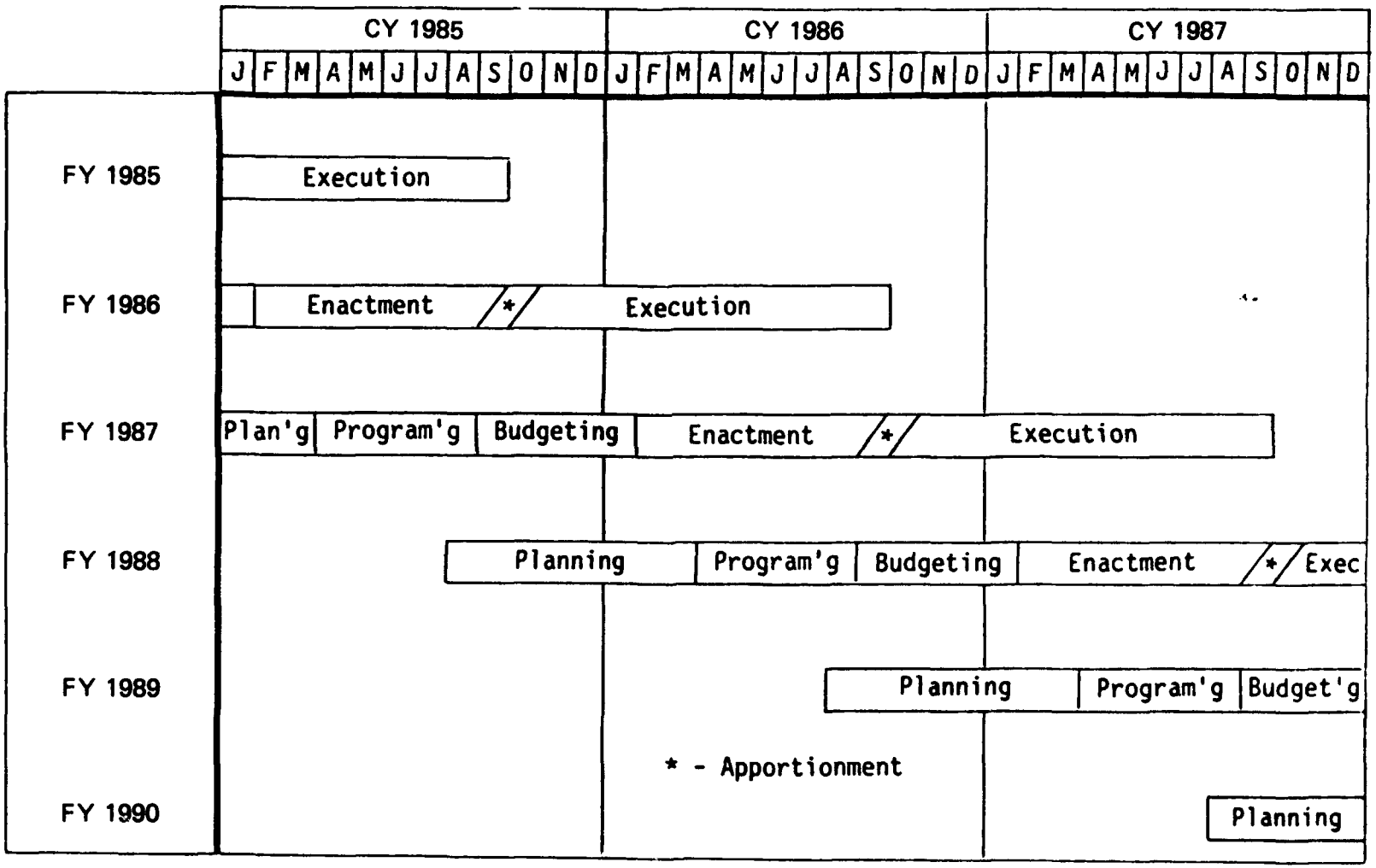

Figure 3-1. Overlap of PPBS Cycles for Various Years

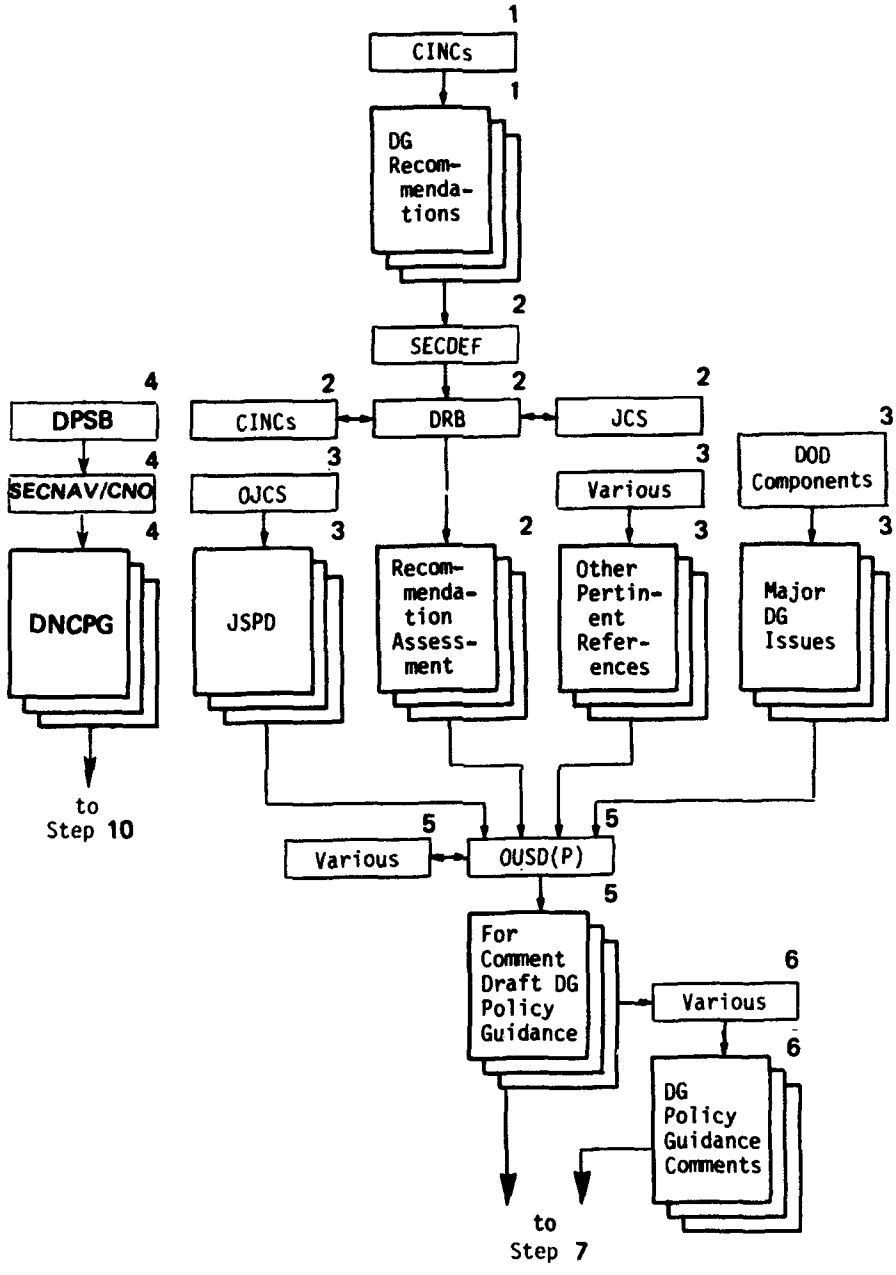

Figure 3-2A. Steps 1-6 of FYDP Update Process

1. In August, the Commanders in Chief (CINCs) of the Unified and Specified Commands prepare their personal recommendations for major changes in the previous Defense Guidance (DG) (see 3.3.1).

2. In late August, the CINCs' recommendations 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) (see E9.6) to review and assess their recommendations. (SECNAV and the other Service Secretaries are members of the DRB.)

3. In late August/early September, various organizations provide major DG issues to the planning process to the SECDEF. These include: the Joint Strategic Planning Document (JSPD) (see 3.3.2) from the Organization of the JCS (OJCS); major issues which the Department of Defense (DOD) Components 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.

4. In October, a policy and programming guidance DPSB (Department of the Navy Program Strategy Board) (see E9.11) covenes to obtain CNO and SECNAV approval of the DNCPG (Department of the Navy Consolidated Programming Guidance) which provides top-level guidance for Navy programming. (For preparation of POM-87, the DNCPG consolidated the CPPG (CNO Planning and Programming Guidance) (see 3.3.4) and the DNPPG (Department of the Navy Planning and Programming Guidance) (see 3.3.3) into a single coordinated guidance document.)

NOTE: Part of the DNCPG is used by the Navy to provide input for the major DG issues in Step 3 above.

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

6. In early October, the OUSD(P) provides the For Comment draft Policy Guidance section of the DG to the 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 comment.

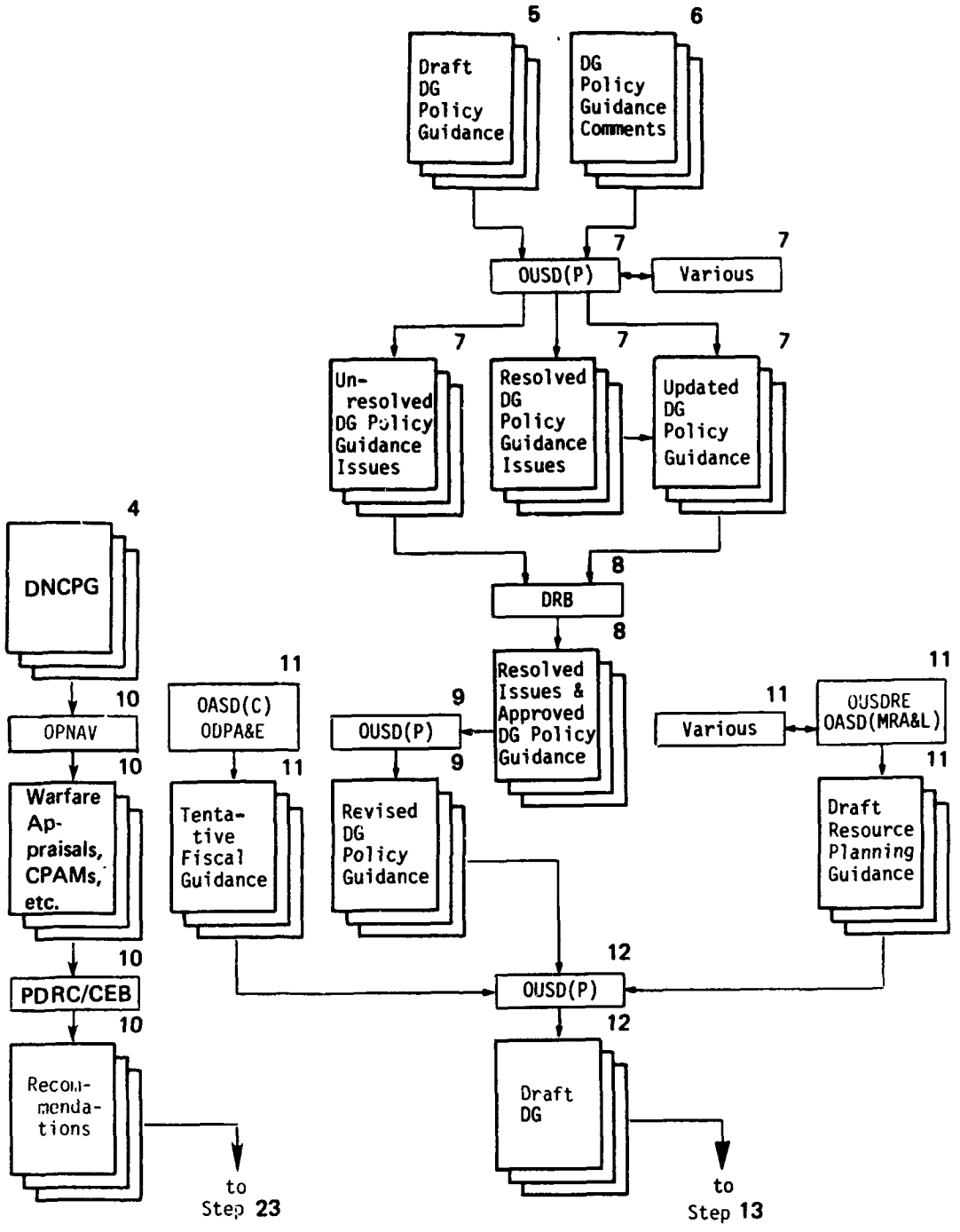

Figure 3-2B. Steps 7-12 of FYDP Update Process

7. Before mid-October, 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.

8. In late October, the DRB meets to resolve the remaining issues and to review and approve and/or modify the updated Policy Guidance section of the DG.

9. In late October, the OUSD(P) revises, as necessary, the updated Policy Guidance section of the DG.

10. From October to January, based on the DNCPG, OPNAV prepares and presents Naval Warfare Appraisals, CPAMs (CNO Program Analysis Memoranda see 2.1.3.5), Baseline Assessments, and other information to the Program Development Review Committee (PRDC) (see E9.10) and the CNO Executive Board (CEB – see E9.5).

11. In September/October, the Under Secretary of Defense for Research and Engineering (USDR&E) and the Office of the Assistant Secretary of Defense, Manpower, Reserve Affairs and Logistics (ASD(MRA&L)), in coordination with the Office of the Assistant Secretary of Defense, Comptroller (OASD(C)), the Office of the Director, Program Analysis and Evaluation (ODPA&E) and the staffs of the DOD Components, the OJCS and the OSD, prepare a draft Resource Planning Guidance. At the same time, the OASD(C) and the ODPA&E prepare Tentative Fiscal Guidance.

12. In early November, the draft Resource Planning Guidance and the Tentative Fiscal Guidance are forwarded to the OUSD(P). Based on these documents and the revised Policy Guidance section of the DG, the OUSD(P) prepares the draft DG.

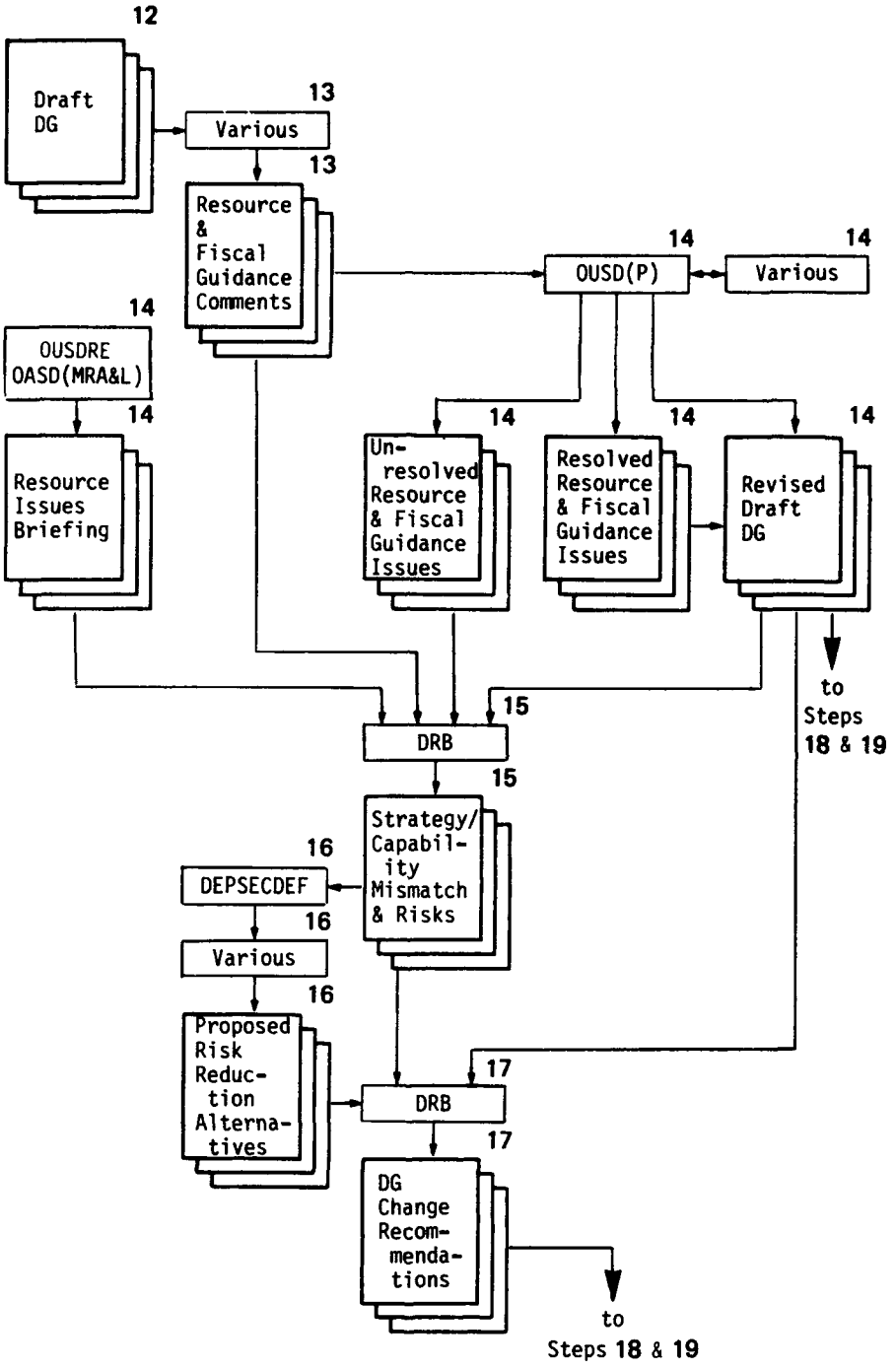

Figure 3-2C. Steps 13-17 of FYDP Update Process

13. In early November, the draft DG is provided to the DOD Components, the CINCs, the NSC staff, the Department of State, and the OMB for review and comment on the Resource and Tentative Fiscal Guidance sections of the draft DG.

14. By mid-November, 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 OUSDRE and the OASD(MRA&L) prepare briefings on the resource issues of the draft DG.

15. In late November, 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.

16. In late November/early December, as a result of the DRB review and briefing, the SECNAV and other Service Secretaries, OSD members, and the JCS, working with the DRB members, are tasked, as necessary, by the Deputy SECDEF (DEPSECDEF) to develop proposed alternative solutions to reduce the identified risks.

17. In early December, 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.

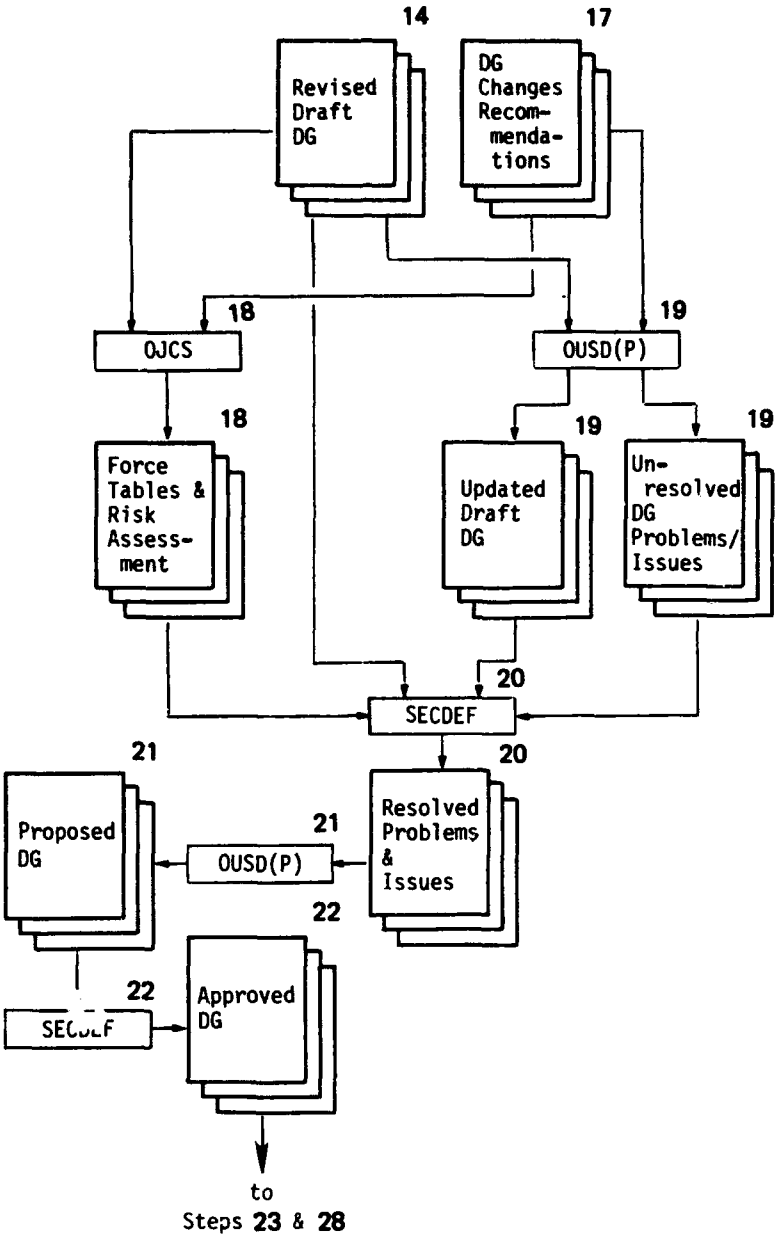

Figure 3-2D. Steps 18-22 of FYDP Update Process

18. By mid-December, the OJCS, based on the revised draft DG 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 the forces ability to carry out the strategy contained in the DRB recommendations.

19. In mid-December, 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.

20. At the end of December, the updated draft DG, the DRB recommendations as to mismatch and risks, the associated OJCS force tables and risk assessment, and any unresolved problems and/or issues are reviewed and resolved by the SECDEF.

21. In early January, based on the updated draft DG and the SECDEF decisions, the OUSD(P) prepares the proposed DG.

22. In early January, the proposed DG is presented to the SECDEF for review and approval.

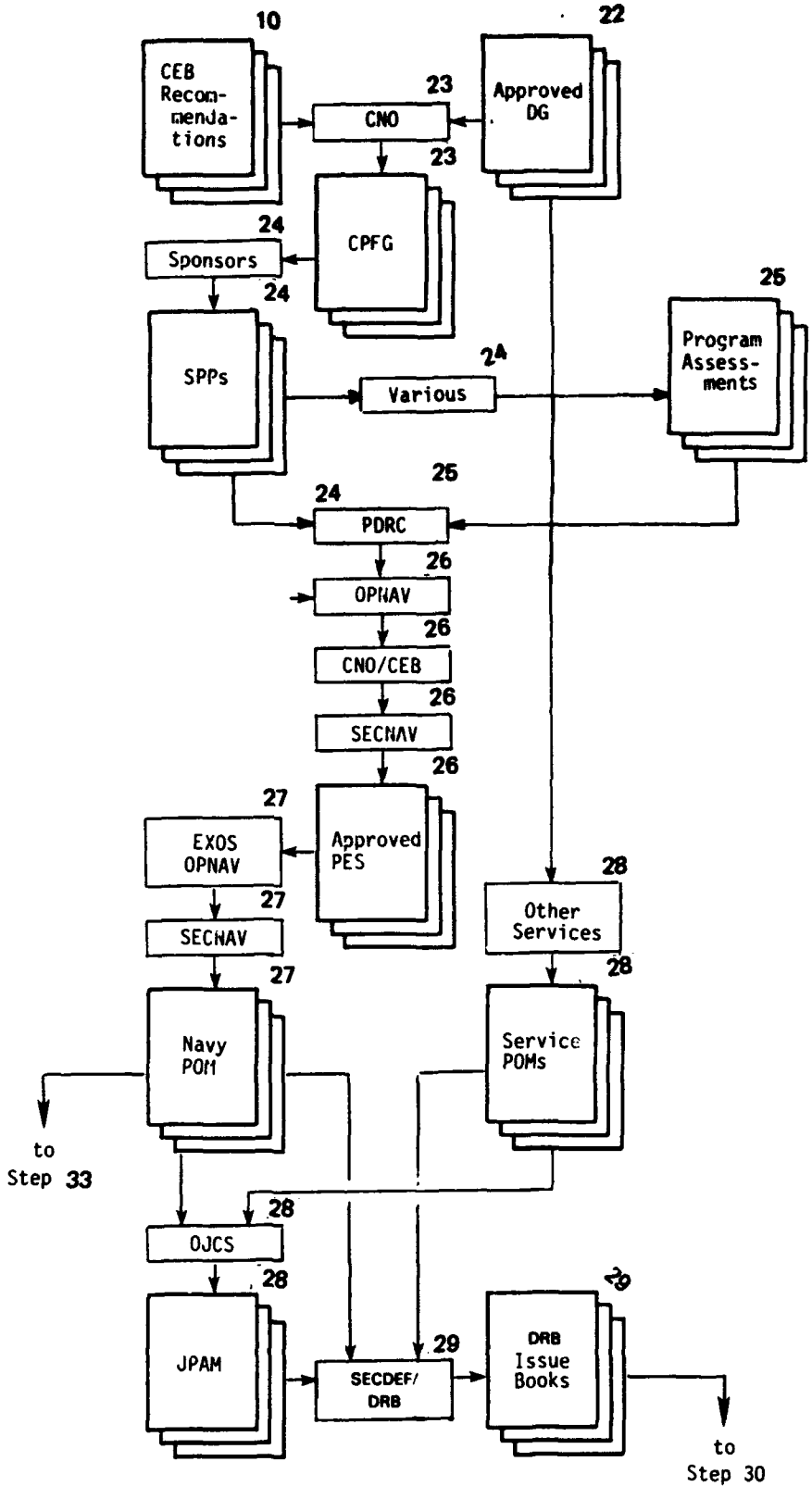

Figure 3-2E. Steps 23-29 of FYDP Update Process

23. In early February, based on the DG, the CEB recommendations, and the CNO's direction, OPNAV promulgates the CNO Programming and Fiscal Guidance (CPFG) (see 3.3.6) which provides guidance for the development of the Navy Program Objectives Memorandum (POM) (see 3.3.10).

24. In March, OPNAV Resource Sponsors prepare Sponsor Program Proposals (SPPs) (see 3.3.7). SPPs are distributed and presented to the PDRC for review, assessment, and approval.

25. In March, The Director of Naval Warfare (OP-095) and other senior officials analyze the proposed program from various perspectives and forward their assessments (see 3.3.8) to the PDRC.

26. In April; based on the SPPs, program assessments, and PDRC recommendations; OPNAV prepares the Program Evaluation Summary (PES) (see 3.3.9) which is presented first to the CNO and CEB and then to SECNAV for review and approval.

27. In May, OPNAV and the SECNAV Staff complete the documentation of the Navy POM and submit it to SECNAV for review and approval.

28. In May, the Department of the Navy POM and the POMs of the other Military Departments and Defense Agencies are provided to the SECDEF, the other DRB members, and the OJCS. Based on review of the POMs and OJCS prepares its Joint Program Assessment Memorandum (JPAM) (see 3.3.11).

29. In June, 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. Some issues 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 DRB Issue Books.

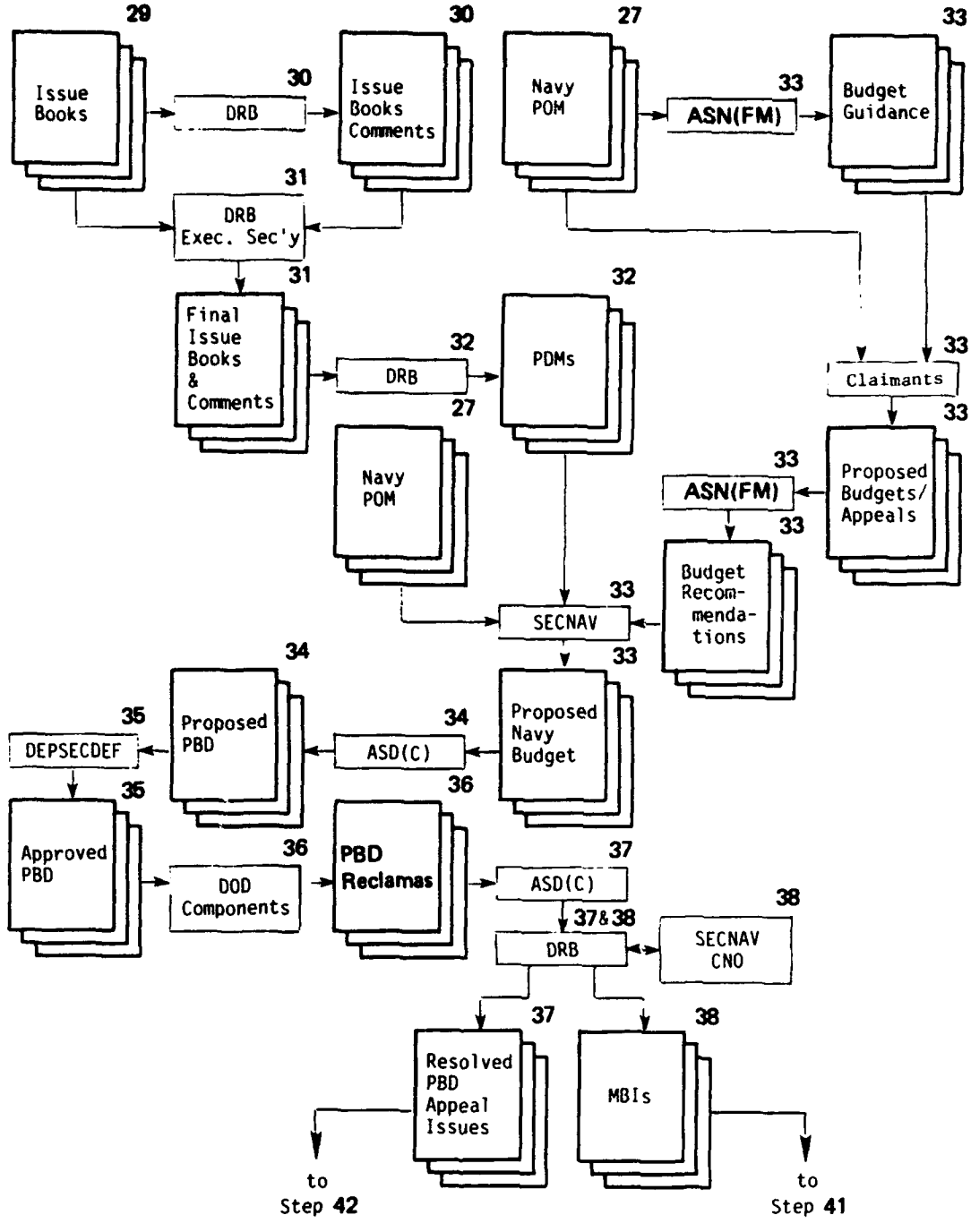

Figure 3-2F. Steps 30-38 of FYDP Update Process

30. In June, copies of the Issue Books are provided to the DRB members for review and comment.

31. In July, the DRB comments are provided to the DRB Executive Secretary for assembly into Issue Books.

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

BUDGETING PHASE (June 1984 to early December 1984)

33. In June and July, based on the Navy POM and guidance from the Assistant SECNAV (Financial Management) (ASN(FM)), the Navy Claiments prepare and submit their proposed budgets to the ASN(FM). The POM, PDM, proposed Claimant budgets and ASN(FM) recommendations and resultant SECNAV decisions form the basis for the Navy's proposed budget.

34. In September, the proposed budgets of the Navy and the other DOD Components are submitted to the ASD(C). After review, ASD(C) coordinates development of an OSD position on the proposed budgets. These positions are recorded in a set of proposed Program Budget Decisions (PBDs).

35. In October and November, the proposed PBDs are submitted to the DEPSECDEF for review and approval.

36. In October and November, copies of the proposed PBDs are also supplied to the DOD Components. After review, the DOD Components prepare reclamas for items with which they are in disagreement.

37. In November, the DOD Components' reclama issues are considered, with some presented to the DRB for review and resolution.

38. In mid-December, 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.

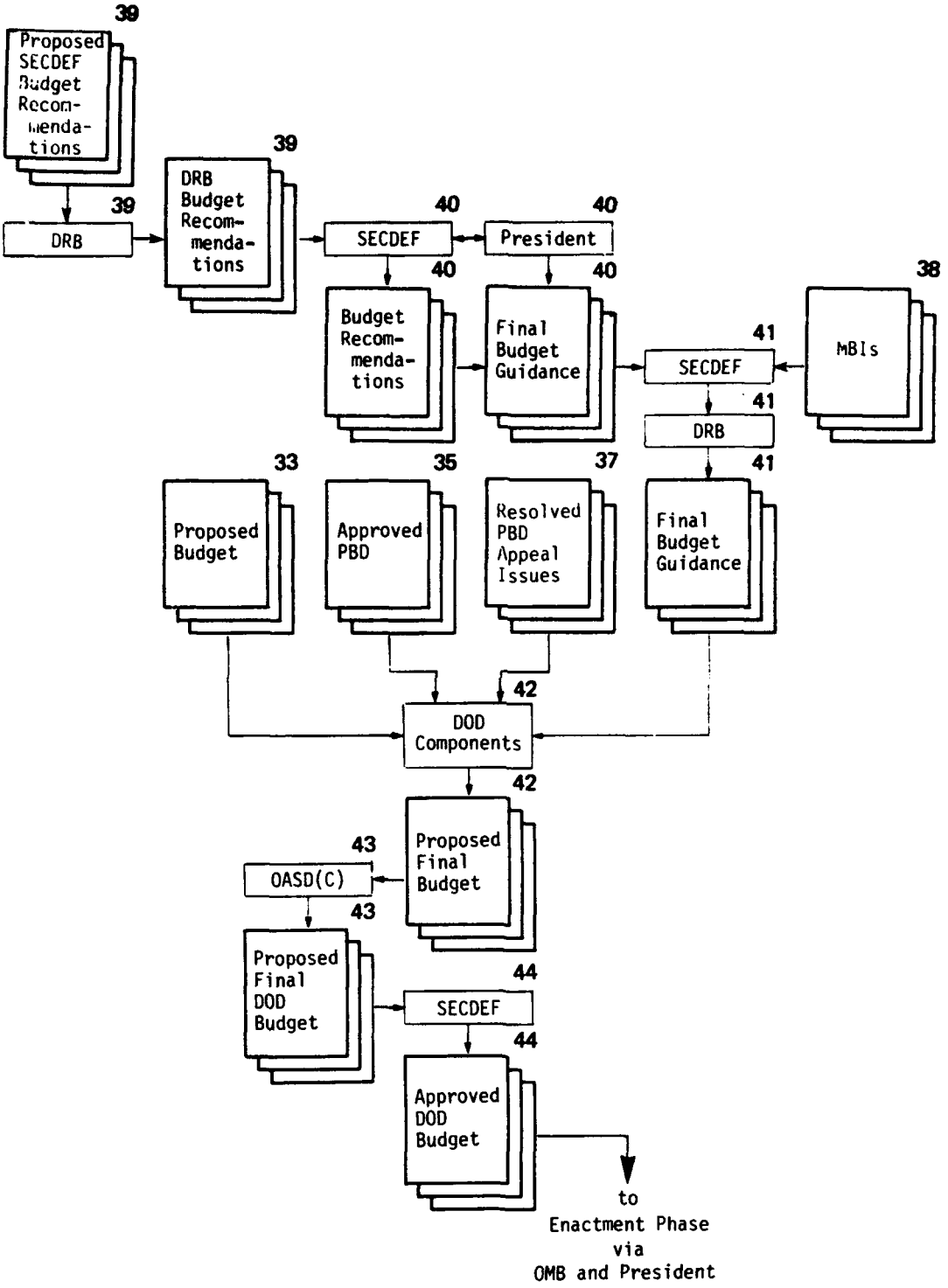

Figure 3-2G. Steps 39-44 of FYDP Update Process

39. In early December, 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.

40. In mid-December, 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 budget guidance.

41. In mid-December; based on the approved PBDs, the DOD Components' PBD reclamas, resolution of MBIs, and the President's final budget guidance provided to the SECDEF; the DRB meets to establish the final budget guidance for the DOD Components, which is transmitted by the final PBDs.

42. In late December, the DOD Components prepare their proposed Final Budgets based on the final budget guidance, their earlier submitted proposed budgets, the approved PBDs, and their PBD reclama resolutions.

43. In late December, the DOD Components' proposed Final Budgets are forwarded to the OASD(C) which combines them into a single proposed Final DOD Budget.

44. In late December/early January, 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 consideration and eventual enactment.

SELECTED REFERENCES ON THE PROGRAMMING PROCESS

Department of the Navy Programming Manual is the primary source of information for Department of the Navy personnel 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.

DODINST 7045.7 (SECNAV 5000.16), "The Planning, Programming, and Budgeting System," establishes Navy responsibilities for processing and maintaining documents, records, and reports for the DOD programming system. DODINST 7045.7 establishes procedural guidance for processing changes to the FYDP, for review, analysis, and approval of new programs, and for maintenance and updating of the program structure.

SECNAVINST 5000.16, "Policy, Roles, and Responsibilities within the Department of the Navy for Implementation of the DOD Planning, Programming, and Budgeting System (PPBS);" promulgates DOD 7045.7 and establishes responsibilities of Navy organizations in FYDP-related processes.

POM-(FY)-1 (in 1985 POM 87-1), "Program Objective Memorandum Procedures for POM-(FY)" is the primary source for specific POM preparation information. It is a memorandum issued each year by the Director, Navy Program Planning (OP-090).

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.

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

CHAPTER 4 PREPARATION AND JUSTIFICATION OF THE BUDGET

TABLE OF CONTENTS

CHAPTER 4
PREPARATION AND JUSTIFICATION OF THE BUDGET

This chapter covers the development, presentation, and justification of the budget, a process beginning more than 15 months before the start of the fiscal year and extending to passage of the Appropriation Act. (Steps 33 through 44 of Section 3.4 of the preceding chapter present the process for development of the DON budget from its initiation following approval of the POM through to submission of the President's Budget to the Congress in January.)

This chapter will discuss the RDT&E budgetary process in terms of its objectives and mechanisms, as well as the responsibilities of the various officials and agencies involved in developing it. The chronology of events in preparing and justifying the budget will be set down with this note of caution: no two years are ever exactly alike. The process of Congressional justification will then be covered.

4.1 PLACE AND IMPORTANCE OF BUDGETING IN THE MANAGEMENT PROCESS

Budgeting is definitely not a "technical accounting matter" concerned with "keeping the books." It is within the framework of the budget formulation process that programs must compete for approval and implementation. Just as plans are meaningless unless they win approval for inclusion in the Five-Year Defense Program (FYDP), programs must win inclusion in the budget. In this continuous process, plans are translated into programs and programs are incorporated into budgets on a selected basis.

Appearance of a program in the FYDP is not an automatic guarantee that it will be funded. The budget is constrained historically by estimated national dollar resources irrespective of the Total Obligational Authority (TOA) approved for the budget year in the FYDP. Since the magnitude of resources allocated to defense in any given year is usually less than the total of the programs approved in the FYDP, certain programs may be reduced or deleted when the budget is actually formulated. Programs may be reduced or deleted in order 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 actual framework for day-to-day management. The First Hoover Commission emphasized this fact 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 this chapter and the process it portrays.

Mark-up — the process of modifying budget submissions and reducing, increasing, revising or eliminating items, and providing appropriate 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; multi-year 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 for only 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 the entire DON RDT&E Program by program elements, budget projects, and associated dollars. It is used to back up budget submissions to NAVCOMPT, OSD, OMB, and the Congress; and for POM submissions and apportionment requests.

*DODINST 7045.7 (SECNAV 5000.16); 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 whose principal subdivisions are:

Title I : Military Personnel

Title II : Retired Military Personnel

Title III : Operation and Maintenance

Title IV : Procurement

Title V : Research, Development, Test, and Evaluation (RDT&E)

Title VI : Special Foreign Currency Program

Title VII : General Provisions.

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

DON Budget Guidance Manual (NAVCOMPTINST 7102.2)

4.3.3 Purpose of Appropriation Structure. The appropriation structure is intended to offer the Congress a convenient means of correlating the RDT&E appropriation with various procurement appropriations. The current structure also readily identifies the dollars relating to the major missions of the Navy. The budget presents the Congress with line items comprising the programs for the ensuing or budget year.

4.4 THE BUDGETARY PROCESS

The program in the FYDP is revised to reflect fiscal constraints, changes in threat assessment, Congressional actions, etc., and in its approved form reflects the decisions of SECDEF. The revised program is then converted to the appropriation structure for the four-year period to be presented in the budget and is supported by detailed shopping lists of items and dollars. The budget plan is expressed in dollar terms. Such things as production schedules, prices, leadtime, activity rates, personnel grade structure, training requirements, etc., are required to reflect the program proposed for inclusion in the budget.

The budget formulation process involves successive reviews and decision points. As each

*For additional information on subjects discussed in this Guide, consult the listed references. Titles, current editions, and promulgation dates of directives on which this edition is based can be found in the Master Reference List following the appendixes. When a DOD directive has been promulgated as an enclosure to a Navy directive, the promulgating directive is shown in parentheses following the DOD listing.

succeeding review considers a broader context, many items proposed for approval are reduced or eliminated. Though it is possible to criticize this process on the grounds of time and talent required, it does serve essential purposes. The objective of the process is a budget which provides the best possible military worth and program balance within the limits of anticipated resources.

DODINST 7045.7 (SECNAV 5000.16)

4.4.1 Concept of the "Balanced Program." A budget which provides the maximum value output for a given level of expenditure implies a condition of balance in which all responsibilities are met more or less equally and in which no item is included which is less essential than any item not included. In order to approach this ideal, alternatives must be weighed and different items, competing for inclusion in the budget, compared. In order to provide a range of choice, more items are considered initially than can be included in the approved list submitted to higher authority.

In general, lower level activities submit to higher echelons a list of requirements which exceed what can be approved. The higher organization, for instance DCNM(A), reviewing submissions from its activities, will then consolidate submissions from these activities and bring the entire list into balance by eliminating or reducing items considered to be marginal. This process at all levels of review is designed to develop a close approximation of a balanced program for submission to the next higher echelon where the process is repeated as balance is sought in a broader context. The process continues to the Congressional level where the Congress must balance defense needs against other national needs.

4.4.2 Incremental Programming Policy. The incremental programming policy provides that only those funds required for work in a given fiscal year are included in the authorization request for that fiscal year for most classes of Research, Development, Test, and Evaluation.

It has been Department of the Navy policy for many years to program and fund RDT&E effort on an **annual incremental** basis as opposed to the **fully funded** program basis of the procurement appropriation.

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

4.4.3 "Justification." Justification is closely related to the process described in the previous paragraph. Each item in the estimates submitted by any organization to the next higher echelon must be supported by written justification. This justification process serves both to support the inclusion of any given item in the program and to indoctrinate higher level officials in the details of the contents of the estimates they will in turn submit to higher echelons, and be called on to justify.

Budget justification is designed to demonstrate that the proposed estimate is:

- Within the framework of the law and approved administrative guidelines.
- Essential to the effective performance of the mission assigned.
- The most economical and effective method of accomplishing its purpose.
- Feasible with respect to timing and the availability of resources.

The "appeal" is closely related to budget justification and mark-up. It plays a vital role in the process of approaching the impossible goal of a more nearly "perfectly balanced program." The appeal is the request for restoration of any item deleted from a budget submission by a higher level organization in its mark-up. In general, successful appeal requires improved justification. The appeal process makes it possible to save worthwhile programs which were eliminated because of inadequate justification. Each review echelon issues instructions for appeal as appropriate.

4.4.4 Function and Source of Guidance. "Guidance" plays an important part in the budget preparation process. Guidance is both substantive and procedural.

4.4.4.1 Procedural guidance. Uniformity, always a goal of accounting practice, is essential if ADP equipment is to be able to summarize submissions from diverse organizations. One of the duties assigned the Comptroller of the Department of Defense when the office was called for by Title IV of the Department of Defense Reorganization Act of 1949 was the establishment of "uniform terminologies, classifications, and procedures" for use in all budgeting and accounting matters.

For the most part, the means by which budget estimates are presented 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 as a basis for preparation of the Appendix to the printed Federal budget. **Backup Material** is required by ASD(COMPT) as he prescribes. **Annex Material** is required by NAVCOMPT upon call concurrent with his review. **Budget Summary Table** feeder data are required by NAVCOMPT for consolidation, publishing, and use of Navy witnesses before Congress. The Office of Naval Research in carrying out comptrollership responsibilities as assigned by ASN(R,E&S) issues procedural guidance for submission of budgetary data for RDT&E to cognizant commands, and offices.

DON Budget Guidance Manual (NAVCOMPTINST 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 the expressed and implied intent of the Congress as stated in previous hearings on the authorization and appropriation requests and in reports accompanying the bills reported out by the various committees for prior-year and current-year budgets.

DODINST 7045.7 (SECNAV 5000.16)

4.4.5 Congressional Budget and Impoundment Control Act of 1974 (PL93-344). PL93-344 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" authorizaton 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 worked out. 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. Table 4-1 sets

out a timetable of Congressional budgetary events under the present budget process.

4.4.6 RDT&E Descriptive Summary (RDDS). The RDDS is a backup document for an RDT&E program element as submitted to the Congress in the annual budget submittal. An RDDS is included for each RDT&E program element for which funds are requested for the budget year. An especially detailed justification is required for projects of $10M or more. Each RDDS includes: identification of the program element/project; a description of the effort; related activities; work performed by (activities); program accomplishments and future program; funding profile; and, for major programs, test and evaluation data. The aggregate of all RDDS constitutes the supporting data for the budget submission to Congress. The RDDS is often referred to in casual conversation as the PEDS (Program Element Descriptive Summary).

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 detailed 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 appropria-

Action to be Completed	Date
President submits Current Services Budget	November 10
President submits his budget	15 days after Congress meets
Standing Committee (e.g. authorization and appropriations committees) and joint committees (e.g. the Joint Economics Committee) submit report of views on budget to Budget Committees	March 15
Congressional Budget Office submits recommendations on concurrent resolution to Budget Committees	April 1
Budget Committees report first concurrent resolution on the budget to their Houses	April 15
Authorization Committees report authorization bills	May 15
Congress completes action on the first concurrent resolution	May 15
Congress completes action on bills and resolutions providing new budget authority (Appropriations Act)	7th day after Labor Day
Congress completes action on second concurrent resolution on the budget	September 15
Congress completes action on reconciliation bill implementing second concurrent resolution. This reconciles the appropriation bills to the dollar allowances in the second concurrent resolution.	September 25
New Fiscal Year begins	October 1

Table 4-1. Schedule of Congressional Budgetary Events

tion of funds. Full Congressional action is required to obtain an increase in authorization for a particular fiscal year once the authorization has been enacted.

Senate hearings, at which the President's Budget is justified, normally follow the House hearings. These hearings normally provide opportunity to submit requests (appeals) to the Senate Appropriations Committee for consideration of changes in the House action. Format for this purpose is prescribed in the DON *Budget Guidance Manual.*

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. On the basis of 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. The CBO has exercised this authority and received numerous staff briefings on programs of Department of Defense including Navy RDT&E.

4.5.2 The President. The President has responsibility 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 assumes official responsibility 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 paragraph 4.8.2 on obligations of executive department officials in relation to the President's budget).

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

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 decisions on the budget. He also plays a major role in the justification of the budget before Congressional committees. (For additional information on the Secretary of Defense, see 1.2.1.)

SECDEF is assisted in carrying out his budgetary responsibilities by various officials and organizations discussed in Appendix E. They include: USDRE (see E1.1), ASD (Comptroller) (see E1.4), DPAE (see E1.6), and the Defense Resources Board (see E9.6).

4.6 DEPARTMENT OF THE NAVY PARTICIPANTS IN THE RDT&E BUDGETARY PROCESS

This section discusses responsibilities of the Secretary of the Navy and various officials and groups who exert major influence on the development and justification of the Navy RDT&E budget submissions.

SECNAVINST 5430.67

4.6.1 Secretary of the Navy (SECNAV). The Secretary of the Navy is responsible for preparing the Navy Budget and submitting it to the Secretary of Defense, OMB, and Congress. The Secretary of the Navy is assisted in discharging these responsibilities by the officials and organizations discussed in the following paragraphs.

4.6.2 Comptroller of the Navy (NAVCOMPT). Under the Secretary of Navy, and subject to the general policies of the ASD Comptroller, the Comptroller of the Navy develops and establishes the basic fiscal policies of the Department of the Navy. He formulates principles and policies and prescribes procedures in the areas of budget

preparation and administration; financial management; accounting, audit, disbursing, and reporting.

NAVCOMPT provides staff services to the Secretary for the translation of policies, plans, and programs of the Navy and Marine Corps into a formal budget for presentation to the Secretary of Defense, the OMB, and the Congress. This office issues guidance to the commands and offices on the form and content for submission of budget estimates and supporting data and on the availability of funds and the purposes for which funds may be spent. This guidance is binding.

4.6.3 Assistant Secretary of the Navy (Research, Engineering, and Systems) (ASN(R,E&S)). ASN(R,E&S) (see 1.4.2) is responsible for management of the appropriation "Research, Development, Test and Evaluation, Navy" in addition to responsibility for department-wide policy supervision of all RDT&E within the Department of the Navy. In carrying out these responsibilities, he is assisted by the Chief of Naval Research/Chief of Naval Development, Director RDT&E, the Oceanographer of the Navy, and the Deputy Chief of Staff, Marine Corps, for Research, Development and Studies.

4.6.4 Chief of Naval Operations (CNO). The Chief of Naval Operations (see 1.4.5 and E3) is responsible for determining and planning the material support needs of the Operating Forces of the Navy (less Fleet Marine Forces and other assigned Marine Corps forces), while the Chief of Naval Material (CNM) is assigned responsibility for meeting the material support needs of the Operating Forces of the Navy.

The CNO is responsible for the overall coordination, content, and priorities of the program the budget is designed to support. Thus he has a vital interest in the process of the development and defense of the budget. The CEB (CNO Executive Board) (see E9.5) assists the CNO in the administration of his budget program responsibilities.

4.6.4.1 Director Research, Development, Test and Evaluation (DRDT&E) (OP-098). The Director RDT&E (see E3.10) plays a dual role in preparing the RDT&E program/budget estimates for the Department of the Navy. He coordinates the programs for Advanced Development, Engineering Development, Operational Systems Development, and Management and Support for the ASN(R,E&S) in the same manner that the Chief of Naval Research (CNR) coordinates Naval Research and the Chief of Naval Development (CND) coordinates Exploratory Development. (CNR/CND is a double-hatted billet.)

In addition, he provides the staff assistance to ASN(R,E&S) to assemble, integrate, and coordinate the Department of the Navy program and project listings of the Navy and Marine Corps RDT&E Program. In carrying out this function, he collaborates with the Commandant of the Marine Corps, the CNM, and the CNR.

The Director RDT&E, acting as staff for ASN(R,E&S), prepares RDT&E program guidance for use by the Naval Material Command, the Naval Medical R&D Command, the Office of Naval Research, and the Commandant of the Marine Corps. The Director RDT&E staff reviews for program content the narrative justification consolidated by ONR. He coordinates the presentation of the RDT&E,N program to USDRE, the ASD(Comptroller), and the Office of Management and Budget. He also participates in the preparation of appeal actions resulting from the budget mark-ups by NAVCOMPT, SECNAV, OSD, and Congressional committees. The ASN(R,E&S), Director RDT&E, and CNR are the principal witnesses before Congressional committees in justifying the RDT&E,N program. In addition, the Director RDT&E coordinates for ASN(R,E&S) all justification for Congressional committees.

4.6.4.2 Navy Program Planning Office (NPPO) (OP-090). The Navy Program Planning Office (see E3.7) is responsible for the integration of "planning, programming, budgeting, and appraising" within the Office of the Chief of Naval Operations. This Office supports the CNO by reviewing programs and financial and manpower decisions to evaluate their impact on the total Navy program and then recommends adjustments as necessary to restore balance. NPPO is the primary point of contact within OPNAV for program and budgetary matters.

4.6.5 Commandant of the Marine Corps (CMC). Assisted by the Deputy Chief of Staff (RD&S), the CMC assembles, integrates, and coordinates the Marine Corps' annual RDT&E program for submission to ASN(R,E&S) and CNO for inclusion in the Department of the Navy program and project listings of the Navy and Marine Corps RDT&E Programs. (see E6.)

4.6.6 Chief of Naval Material (CNM). The Chief of Naval Material (CNM) (see E4) has the responsibility for planning the utilization of resources in the performance of the work in meeting these material support needs of the operating forces of the Navy and of the Marine Corps which are provided by the Naval Material Command. CNM'S Deputies for Logistics and for Acquisition assist CNM in discharging his responsibilities in this area through the budget process.

4.6.7 Chief of Naval Research (CNR). The Chief of Naval Research (see E7) advises ASN(R,E&S) on research matters, coordinates the Navy-wide research program, and administers the research and development programs of ONR. He also provides budgeting, accounting, and related reporting services for the ASN(R,E&S) required for his management and control of the RDT&E appropriation and the related staff services required by the Director RDT&E and CND to fulfill their responsibilities in the integration and coordination of the RDT&E program.

The ONR Comptroller prescribes budget policies and procedures for the RDT&E program. In addition to providing guidance and issuing instructions to the commands and offices for preparation of the budget in support of the approved program, he also coordinates the preparation of the budget estimates for submission, after review and approval by ASN(R,E&S), to the Secretary of the Navy, OSD, OMB, and Congress.

The Comptroller, Office of Naval Research, is assigned collateral duty as Special Assistant to the ASN(R,E&S) for Financial Management. He provides technical guidance and direction in financial matters in support of the planning and programming responsibilities of the ASN(R,E&S), Director RDT&E, CNO, and CNR.

The ONR Comptroller consolidates the program project listings for the Department of the Navy RDT&E program but does not perform the program evaluation required to reduce the program as required by fiscal availabilities, or to establish balance. The program evaluation for ASN(R,E&S) is performed by the Director RDT&E with the advice and assistance of CMC, CND, and CNR (see 1.4.2.3).

SECNAVINSTS 5430.20, 5430.55

4.6.8 Other Advisors to ASN(R,E&S). The following officials assist ASN(R,E&S) in the formulation and review of the Navy RDT&E Program and budget in their areas of functional responsibility.

4.6.8.1 Chief of Naval Development (CND). The Chief of Naval Development directs and manages the Exploratory Development Program. He is the allocation authority for Exploratory Development funds. He is responsible for developing the Exploratory Development Program plan. He is also responsible for preparation of justification in support of that program and for assisting the ASN(R,E&S) in the presentation and defense of the program at higher levels of review (see E4.2.6).

SECNAVINST 5430.67

4.6.8.2 Director of Navy Laboratories (DNL). The DNL (see F2.1) reports directly to the ASN(R,E&S), providing staff assistance and advice on all Navy laboratory matters, including laboratory resource requirements and the MILCON, Management and Support, and IR/IED programs. The DNL also acts as Deputy CNM for Laboratories and, as such, is the subclaimant within the NMC for laboratory resources.

SECNAVINST 3910.3

4.7 DEVELOPMENT AND JUSTIFICATION OF THE BUDGET

The budgetary process may change in some of its details from time to time, but the significant steps in developing the RDT&E budget for FY 19XX are depicted in Figure 4-1.

4.8 JUSTIFICATION OF THE BUDGET BEFORE CONGRESSIONAL COMMITTEES

DODDIR 5400.4 (SECNAV 5730.5); SECNAVINSTS 5730.11, 7040.10; NAVCOMPTINST 7121.3

4.8.1 General Procedure. Following the President's Budget Message, the 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. Thus the Congressional review process involves hearings before those four committees and their appropriate subcommittees, including the R&D Subcommittees of the Armed Services Committees. The role of the Budget Committees established by the Congressional Budget and Impoundment Control Act of 1974 (see 4.4.5) is primarily with regard to fiscal constraints. However, during the budget process the Budget Committees receive testimony, mostly of a broadly informative nature, both from the Service Chiefs and at the staff level; and the Congressional Budget Office calls for staff briefings of a more detailed nature on Defense programs.

For the RDT&E appropriation, the same backup material is submitted to the four committees. This includes the justification book containing the Supporting Data (descriptive summaries) which give the full details on all program elements and on all projects having a value in the budget of $10 million or more. Program element listings, comprising the programs for the past, current, budget, and authorization years, are included in the justification book.

Using this material as a basis for evaluation and questioning, the committees hold formal hearings to establish for the record the position of the Services 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 almost in parallel 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 House, the two committees meet in conference and arrive at an agreed joint position which is submitted to the two Houses for approval and enactment. The authorization as enacted establishes the maximum amount which may be appropriated by the Congress.

The procedure on the appropriation is somewhat 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. During the Senate subcommittee hearings, appeals can be made for restoration of selected eliminations or reductions made by the House. Where there are differences between the Senate bill and the House bill, a conference meeting is held between designated representatives of each House, and a jointly agreed position is reported out. Upon approval by both Houses and signature by the President, it becomes law.

4.8.2 Guidelines for Witnesses before Congressional Committees. When a witness appears before a Congressional committee to testify concerning the budget, he is there as a member of the executive branch supporting the "President's budget."

It is expected that witnesses will carefully avoid volunteering views differing from the budget, either on or off the record. While direct questions at hearings must be answered frankly, a witness who feels that he must set forth a personal view inconsistent with the President's budget will also point out that the President's judgment on the matter was reached from his overall perspective as the head of the Government and in the light of overriding national policy. The witness should make clear that his personal comments are not to be construed as a request for additional funds.

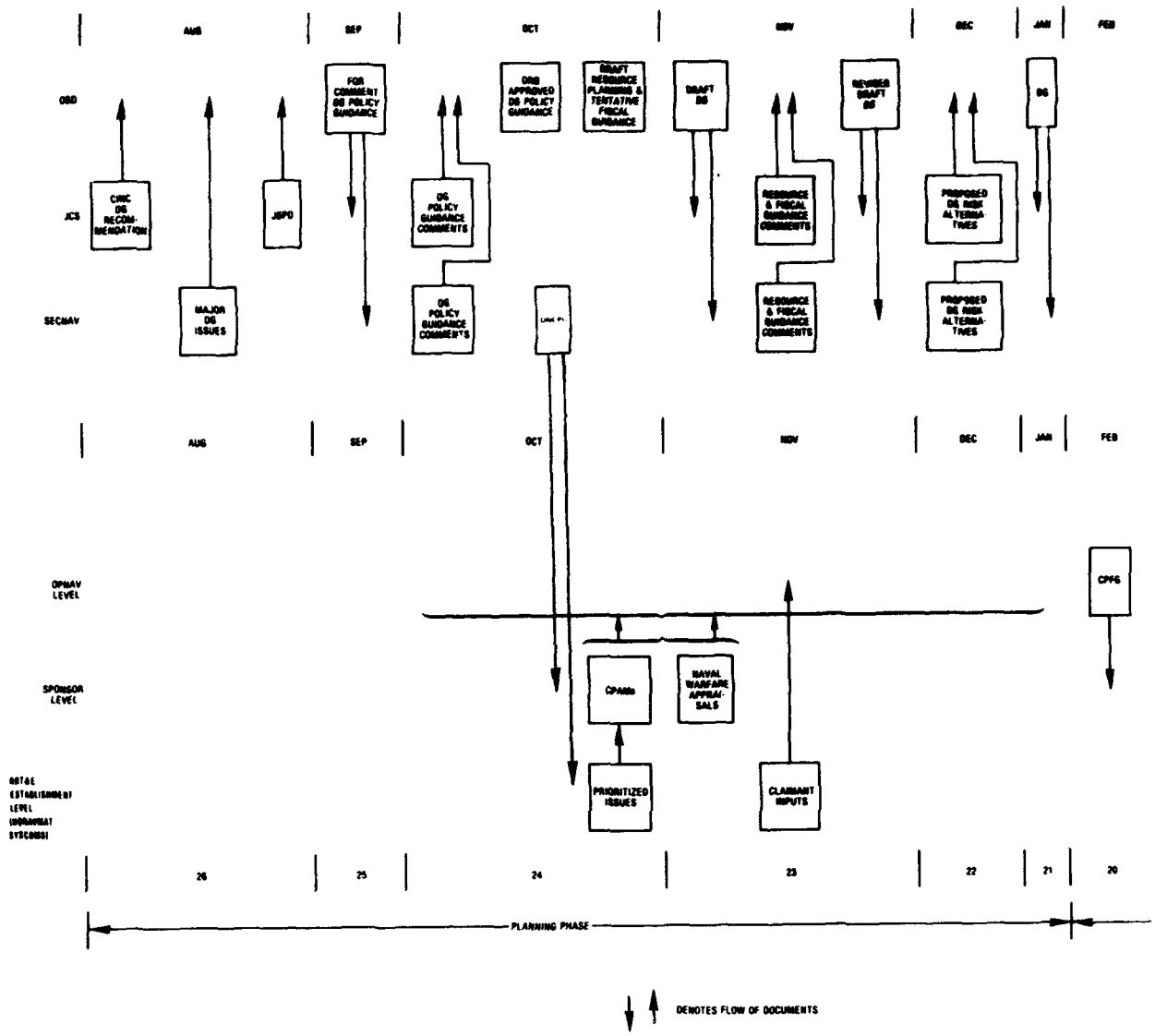

Figure 4-1. PPBS Document Interrelationships and Timing

Title 31 U.S. Code 15 has the following to say on the relationship between an executive department witness and 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 witnesses appearing before committees of the Congress be thoroughly familiar with the above provisions in order that all testimony will meet the basic requirement of supporting the President's budget.

4.8.3 Preparation for Hearings. Every attempt is made to be prepared for hearings so that all questions of members may be answered with a minimum number of witnesses. The attempt to hold down the number of witnesses requires more extensive preparation for the few witnesses who provide the main testimony.

Through preliminary liaison with committee staff, conducted through NAVCOMPT for the appropriations committees, and through the

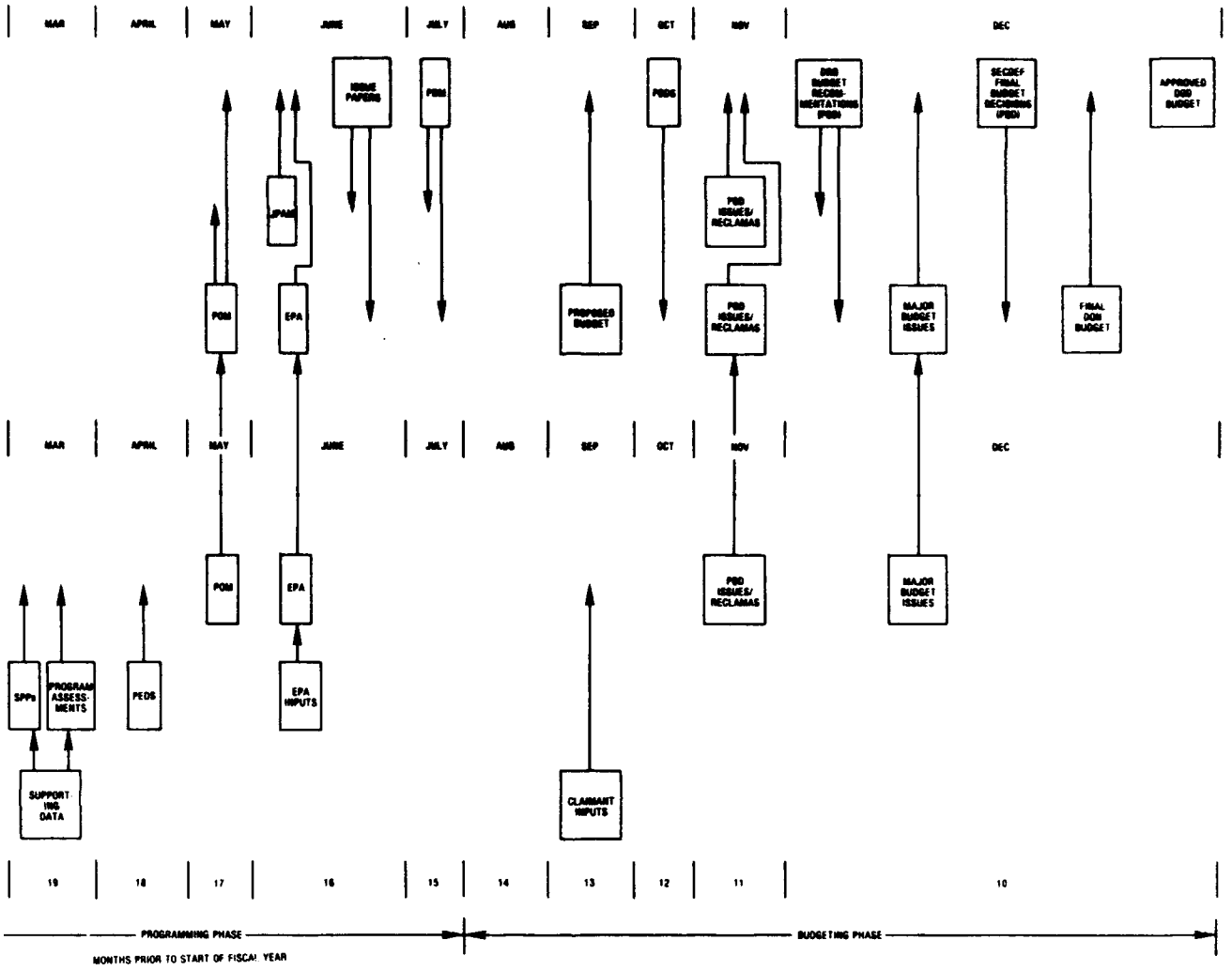

Figure 4-1. (Continued) PPBS Document Interrelationships and Timing

Office of Legislative Affairs for all other committees, particular areas of probable interest and the probable duration of hearings are determined. Sometimes the trend of questioning of other Services will indicate a need for special preparation in certain areas. Press and magazine stories may generate spontaneous questions which can be anticipated and thus prepared for in advance. Thorough review of previous years' testimony is mandatory.

Principal witnesses submit a prepared statement in advance of testimony. These statements are carefully reviewed within the Navy and OSD before submission to the committee 48 hours in advance of scheduled hearings.

4.8.4 Conduct of Hearings. At the authorization hearings, the Secretary of Defense and members of the Joint Chiefs of Staff testify on the overall program. These are also known as the "Posture Hearings." The USDRE is the principal witness in support of the RDT&E program of the Department of Defense before both the authorization and the appropriation committees. The Secretary of Defense also testifies at the appropriation hearings.

The ASN(R,E&S) is the principal witness in support of the Department of the Navy RDT&E program and appropriation requests before both the authorization and appropriation committees.

He is supported by a limited number of his top advisors such as the Director RDT&E, CNR/CND, and DC/S(RD&S) of the Marine Corps.

There is no rigid custom for the conduct of hearings. The committee chairmen may vary the procedure to suit time and interest. Sometimes witnesses read their complete statements and then answer questions. At other times, questions are interjected as points are covered in the statement. If time is short, the witness may be asked to enter the statement into the record, or he may be asked to read a shortened version. Visual aids and film clips are frequently used to augment prepared statements.

Hearings on the RDT&E appropriation are almost invariably in executive session owing to the security classification of the matters discussed. If the witness is discussing a particularly sensitive matter, he may request that it not be recorded, i.e., "off-the-record."

In spite of diligent preparation, occasions occur when the witness will not be able to provide requested information. He may request permission to "provide it for the record."

4.8.5 Review and Editing of the Transcript. The Congressional committees give witnesses an opportunity to review and correct the transcript of their testimony. Witnesses are permitted to correct grammar and other obvious errors provided the substance of the testimony is not altered. Material to be provided "for the record" is added at this time. Classified portions of testimony are bracketed in black pencil and the marginal notation containing the code of the office making the deletion added. Similar treatment is given to questions asked by Congressmen which contain classified information.

Normally only one or two working days are allowed the Services for review of the record. The Director RDT&E coordinates this function for the RDT&E appropriation.

4.9 LATE APPROPRIATIONS

In those instances when an appropriation has not been passed before the beginning of a fiscal year, the Congress normally passes 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, etc. are not permitted.

SELECTED REFERENCES ON PREPARATION AND JUSTIFICATION OF THE BUDGET

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

SECNAVINST 5430.67, "Assignment of Responsibilities for Research, Development, Test, and Evaluation," assigns specific duties and responsibilities to the CNO, CMC, CND, CNM, and CNR in the implementation of the Department-wide responsibilities of the ASN(R,E&S).

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.

NAVCOMPTINST 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 procedures for review of hearing transcripts prior to release. Every witness testifying in support of the budget should be familiar with this instruction.

CHAPTER 5 EXECUTION OF THE RDT&E BUDGET

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CHAPTER 5
EXECUTION OF THE RDT&E BUDGET

One might assume that passage of the Appropriations Act, after more than a year and a half of justification, review, mark-up, and appeal, would mark the end of the battle for the funds required to carry out the Navy's RDT&E program. Such is not the case for RDT&E or any other appropriation. The process continues within the Navy, as well as with OSD, the OMB, and the Congress, until funds are approved, released, and obligated, since changing needs and technology affect the relative value and priority of various programs and projects. Even after the money has been spent, the process continues, in a sense, through audit. These matters are covered in this chapter.

5.1 RESPONSES TO THE APPROPRIATIONS ACT

When the Appropriations Act is passed, actions must be taken to make the funds available to the organizations which carry out the Department of the Navy RDT&E Program. Measures must also be taken to respond to Congressional guidance contained in the Authorization and Appropriations Acts and in committee reports.

5.1.1 Apportionment. Funds must be apportioned before they are actually available for obligation and expenditure. The apportionment process in the Federal Government dates back almost 100 years. As originally enacted, it required that expenditures be spread in an orderly manner throughout the year so as not to precipitate the need for deficiency appropriations.

*DODDIRS 7110.1, 7200.1**

*For additional information on subjects discussed in this Guide, consult the listed references. Titles, current editions, and promulgation dates of directives on which this edition is based can be found in the Master Reference List following the appendixes. When a DOD directive has been promulgated as an enclosure to a Navy directive, the promulgating directive is shown in parentheses following the DOD listing.

5.1.1.1 Apportionment defined. Apportionment is defined as:

> A determination by the Director, Office of Management and Budget as to the amount of obligations which may be incurred during a specified period under an appropriation, contract authorization, other statutory authorizations, or a combination thereof, pursuant to Section 3679 of the Revised Statutes as amended (31 U.S.C. 665). An apportionment may relate either to all obligations to be incurred during the specified period within an appropriation account or to obligations to be incurred for an activity, function, project, object, or combination thereof.

5.1.1.2 Apportionment Request. Approximately in the third quarter of the fiscal year, NAVCOMPT issues a formal notice calling for submission of apportionment programs for the coming year.

Although the NAVCOMPT call is issued late in the third quarter, Administering Offices of R&D organizations have been conducting a continuing review of their requirements to update their programs and to anticipate the effects of actions by the Congress during the budget review process.

Early in the calendar year, the Director RDT&E, acting for ASN(R,E&S), issues guidance on development of the RDT&E,N apportionment request and the revised program objectives for the succeeding budget year. ONR, acting for ASN(R,E&S) and Director RDT&E, incorporates the recommendations in various listings and submits these to Director RDT&E. After these submissions are reviewed and, in some cases, adjusted, recommendations are presented to the CNO Executive Board and ASN(R,E&S), where decisions are made.

These reviews also include incorporation of the effects of program actions which are approved subsequent to submission of the budget to Congress. The Systems Commands, Offices, and BUMED conduct their reviews of apportionment programs in much the same manner as budget estimates are reviewed. The review and approval channels leading to submission of the apportionment program to OSD are the same as for budget estimates.

The NAVCOMPT requirements for submission of apportionment data include the RDT&E program project listing, which are submitted by the ONR Comptroller.

The apportionment schedule, DD Form 1105, is submitted by NAVCOMPT to the ASD(Comptroller) within three days after passage of the Appropriations Act. The DD Form 1105 must be submitted to OMB within 15 days after passage of the Appropriations Act.

Upon receipt of the approved apportionment, and taking into account the recommendations of OSD and ASN(R,E&S), NAVCOMPT allocates the RDT&E,N appropriation to ASN(R,E&S). ASN(R,E&S) then makes suballocations to the RDT&E,N Administering Offices.

5.1.1.3 Apportionment Hearings. USDRE is responsible for review of the complete RDT&E program submitted in support of the request for apportionment. Upon receipt of the project listing, USDRE commences review, covering the current and budget year programs and supporting data. Data are submitted late in the fourth quarter in compliance with a USDRE request made earlier in that quarter. USDRE may conduct comprehensive hearings jointly with OMB and ASD (Comptroller). These hearings involve technical presentations on specific major systems and projects by Navy personnel.

It must be emphasized that the "program" recommendations are generally made by USDRE and approved by the Secretary of Defense. The ASN(Comptroller) is also involved in these recommendations, particularly where financial or cost/effectiveness considerations are factors. OMB makes an indirect review of decisions. The results of OMB decisions become apparent by action on the Apportionment Schedule, DD Form 1105, submitted to OMB by OSD.

USDRE makes recommendations for approval of programs which are transmitted to the Services as program guidance by the start of the fiscal year and reflect USDRE guidance on the program submitted in support of the request for apportionment. USDRE indicates the part of the program which is not approved (deferred) and the rationale underlying the decision.

5.1.2 Documentation of RDT&E,N Apportionment. The Comptroller of the Navy provides notification of the apportionment of RDT&E,N funds and approves allocation to ASN(R,E&S) by means of the following documents:

5.1.2.1 Apportionment and/or Reapportionment Schedule (DD Form 1105). This document records the action of the Comptroller of the Navy, the Office of the Secretary of Defense, and the OMB on the requested apportionment of appropriated funds and reimbursable authority to the Department of the Navy for the RDT&E,N appropriation. Appropriated funds are not available to the Department of the Navy for obligation until final authorization (SD 440) has been completed. The DD 1105 is prepared by the ONR as staff to ASN(R,E&S).

5.1.2.2 RDT&E Program/Fund Authorization (SD Form 440). Signed jointly by the USDRE and ASD(Comptroller), this document specifies the amounts deferred and the amounts approved for obligation for each program element. When appropriate, the Comptroller of the Navy will append to the SD 440, in the letter of transmittal, additional fiscal guidance and/or limitations.

5.1.2.3 Budget Activity Allocations (NAVCOMPT Form 2058). This document effects the allocation of available funds from the Comptroller of the Navy to ASN(R,E&S).

5.1.3 Operating Budget Allocations by ASN(R,E&S). Allocation to administering organizations is accomplished with NAVCOMPT Form 2197, RDT&E,N Operating Budget Allocations, prepared by ONR acting as staff to ASN(R,E&S). Amounts allocated are in accordance with higher level allocations and apportionments by the OMB, OSD, and NAVCOMPT and are based on program guidance from CNR/CND and Director RDT&E for their respective program areas.

5.1.4 Action on General Provisions. Reports on authorization and appropriation acts, and the acts themselves, contain general provisions requiring actions by the Department of the Navy.

Reports and acts are carefully reviewed to identify actions required. Responsibilities are assigned and followup procedures established to make sure that appropriate actions are taken.

DODDIR 5545.2; DODINST 5545.3 (NAVCOMPT 7130.25); SECNAVINST 7040.10; NAVCOMPTINST 7130.25

5.1.5 Administration of Deferrals. Deferrals established by USDRE, ASD (Comptroller), or Navy officials may be temporary, requiring only completion of Congressional action on the DOD Appropriations Act or submission of additional program information, or they may be of indefinite duration requiring a major program change.

In terms of day-to-day operations as the year progresses, programs which are partially deferred may be jeopardized. In these situations, the need for additional incremental releases must be anticipated to preclude work stoppages and the jeopardizing of relations with contractors.

Some programs remain in a deferred status throughout the year owing to lack of justification considered adequate by ASD (Comptroller) or USDRE. These may be carried over into the next fiscal year, used for the original purposes when eventually approved, or the resources may be reprogrammed to meet other program requirements.

5.2 OBLIGATION AND EXPENDITURE OF FUNDS

The process of apportionment, allocation, and allotment extends the authority to obligate funds down through the organization. That is, it makes it possible to issue orders, make contracts, and otherwise do things which will establish an obligation for an eventual expenditure. Obligation authority and program approval are the tools through which control is exercised in execution of the budget.

DODDIR 7200.1

5.3 ACCOUNTING FOR RESEARCH AND DEVELOPMENT

Improvement in financial management systems has been a continuing objective. It should be expected that change and improvement will characterize the R&D accounting and other resources management systems for many years.

DODINST 7220.24; NAVSO P-3062 Financial Management of Resources, RDT&E, N; NAVMATINST 7044.4; NAVCOMPTINSTS 7044.8; SECNAVINST 5430.87

5.3.1 Objectives of R&D Accounting. The basic objectives of the R&D accounting system include the following:

- To provide a standardized means and data base for the collection of all financially oriented information used in programming, budgeting, and accounting.
- To serve the reporting needs of managers at all echelons within the DOD.
- To meet the data requirements of the Congress, OMB, the Treasury Department, and other Government agencies.
- To employ the most useful information-processing techniques, including the appropriate use of automatic data processing equipment and optimum standardization of data elements and codes.
- To conform to statutory requirements for financial management systems, including the accounting principles and standards prescribed by the Comptroller General of the United States and related legislation.
- To estimate and justify total and annual requirements for implementation of plans.
- To identify all costs to end product and performing activity.

The purposes for which accounting systems are used have undergone historical development. When financial systems were originally established, the primary concern was to prevent breaches of trust and misappropriation of public funds. Accounting and other financial systems were therefore concerned primarily with the purposes for which funds were appropriated and the status of unobligated funds.

While the necessity to account for obligations remains, emphasis has shifted to resources management systems that can provide government managers with the information they need to put public resources to their most productive use in accomplishing public purposes. Accordingly the R&D accounting system is designed to:

- Focus on outputs and resources used.
- Focus on managers who are responsible for effective and efficient utilization of resources.
- Focus on actual performance in relation to planned performance.
- Permit the use of operating budgets as a primary aid in management control at each organizational level.

The following paragraphs discuss a number of aspects of the continuing evolution in accounting techniques which seek to inject more useful measures of effectiveness and feedback into the planning, programming, and budgeting phase of financial management.

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

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

- Distinguishing "investments" from "expense."
- Ensuring that the RDT&E,N appropriation is in fact chargeable for all feasible and appropriate costs of research and development.

DODINST 7040.5 (SECNAV 7040.6); DON Budget Guidance Manual (NAVCOMPT 7102.2); NAVCOMPT Manual

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5.3.3.1 Expenses vs investments. Current instructions provide detailed guidance for assigning costs to the categories of "expenses" or "investment." The criteria set forth in these instructions consider (1) the intrinsic or innate 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 conditional circumstances under which an item is used or the way it is managed.

5.3.3.2 Research and development cost definitions. Instructions dealing with this topic establish criteria and definitions to be used in (1) specifying and classifying the resources of the R&D program of the FYDP, (2) specifying and classifying the programs and financial content of accounts which provide R&D resources in the DOD budget, and (3) defining the financial content of the related accounts within the DOD management accounting system. In other words, these instructions seek to provide criteria to answer the question, "What is an RDT&E cost?"

5.3.4 Distribution of Costs to Benefiting R&D Projects. Several systems are used to distribute costs incurred at each individual RDT&E activity to the productive work accomplished. Large multifaceted RDT&E activities, such as the Naval Air Development Center, employ working capital funds. Less complex RDT&E activities employ operating budgets as alternative working capital arrangements. A third class of small and simple activities can adequately relate costs to results without such sophisticated accounting devices.

5.3.4.1 Working capital 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 all its expenses—manpower, material, utilities, administration, etc.—out of working capital and charges its customers the full cost of its products or services. These costs, compared with other industrially funded Government organizations and industry, provide a measure of the organization's efficiency in the use of resources.

DODDIR 7410.4; DODINST 7410.5 (NAVCOMPT 7331.1); NAVCOMPTINST 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 encompasses all direct and reimbursable funds and provides for annual budget estimates and periodic reports of performance (against the estimate) based on actual accounting data.

Under the operating budget, an activity is divided into "cost centers," an arrangement which pinpoints responsibility for effective use of resources, with an accountable individual in charge.

Financial plans and accounting reports in support of the operating budget provide analyses of direct, indirect, and general costs (according to cost center) and show the basis for and distribution of indirect and general costs to direct work. These techniques provide the basis for facility management.

5.3.5 Accounting for Accrued Expenditures. The central function of management is to put resources to their most productive use in achieving the results required by the mission. In carrying out this function, managers must make tradeoffs, i.e., move resources from less to more productive uses. To do this, management needs information on the relationship between resources used and results produced. Providing management that information is the central idea behind accrual accounting.

Accounting systems provide significant milestones in the consumption of financial resources. The traditional milestones have included authorization, obligation, and disbursement: obligation occurs when the user legally becomes liable for payment of costs for labor, materials, or contractual goods and services; disbursement occurs when payment for goods and services is actually made. Although these milestones are significant and necessary for financial management, they bear no relationship to the effectiveness of the use of resources. Most obligations in the RDT&E,N appropriation occur when contracts are awarded or when work requests are accepted; obligation, therefore, indicates only that work is ready to begin, not that it has actually begun. Disbursements against work requests and contracts do not occur until after costs are incurred and, in some cases, not until years later. An accrued expenditure, on the other hand, occurs when goods or services are received, when performance is accepted, or when other expense is incurred, whether payment has been made or not. Thus, accrued expenditure is a financial parameter closely related to performance.

In order to make accrued expenditure information available to all RDT&E managers in the Navy, the accounting system has established general ledger accounts for recording and reporting accrued expenditure.

DODINST 7220.24

5.4 PROGRAM MANAGEMENT PROPOSAL (PMP)

The PMP is to alert CNO, CNM, and SECNAV of developments in major programs likely to result in a cost increase which may detract from the stability of the total DON program.

The PMP can be either a decision document or an alerting document depending on its particular purpose and content. It ensures, in cases where increased cost is discretionary, that there will be no "real" unit cost growth without CNO, CMC, and SECNAV *approval.*

In those cases where cost growth is a "fact of life," the PMP is designed to be an early-alerting mechanism. The PMP process provides the CNO, CMC, and SECNAV with program management quantity and cost control which is not available through the milestone-decision process.

A PMP must be initiated when conditions likely to result in a cost increase come into being or are first detected.

DONPIC memo Ser 902D1/4U601237 of 23 May 84

5.5 REPROGRAMMING

One of the principal functions of the manager is making tradeoffs (moving resources between programs and projects to their most productive use). The execution of the program, in the interest of maximum effectiveness, will inevitably demand changes since the budget submission is based on plans which are 15 months old or more by the time execution begins.

While the effectiveness of management may demand shifting funds from specific uses originally planned to others where they can make a greater contribution to military worth, the maintenance of good faith with the 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 accept the view that rigid adherence to the amounts justified for individual budget activities 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 adjustments, etc., require some diversion of funds from the purposes for which they were justified.

Reprogramming procedures, developed in consultation with the committees, provide a firm basis for retention of Congressional control over the utilization of Defense appropriations by making sure 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 Armed Services and Appropriations Committees of both Houses have directed that the Department of Defense adhere, within certain accepted variances, to the program justified in the budget. Before any change which exceeds established thresholds is made in a budget program, or any change is made in a program which has been designated "special interest," a reprogramming action must be taken so as to provide both committees with a description of significant variations from the justified amounts and purposes. The established procedures:

- **Establish the base from which actions may be taken.** All reprogramming actions are accomplished in relation to a "Base for Reprogramming Actions" which is established immediately after final Congressional action on the authorization and appropriation has been completed. It is submitted on DD Form 1414 through OSD to the Congressional committees and identifies the purposes in terms of budget subactivities (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 and/or the specific application of adjustments made by DOD when not specified by the Congress. For example, Congress may make an across-the-board reduction of 3 percent in the RDT&E appropriation without specifying how it will be applied. The DD Form 1414 will show how the DOD elected to apply this reduction to specific programs.

- **Specify actions requiring prior written approval of both SECDEF or his Deputy and the Armed Services and Appropriations Committees of Congress.** Any reprogramming action involving the application of funds, irrespective of the amount, to items, programs, or functions specifically eliminated or reduced by Congressional action, or to items in which the Congressional committees have expressed a special interest requires *prior* SECDEF and Congressional approval.

- **Specify reprogramming actions requiring prior written approval of SECDEF with notification of the Armed Services and Appropriations Committees**

of Congress. Any reprogramming action, single or cumulative, involving an increase of $4 million or more in any budget subactivity, including the addition of a new budget subactivity line item of $2 million or more or the addition of a new budget subactivity line item, the cost of which is estimated to be $10 million or more over a three-year period, requires the prior approval of SECDEF or his Deputy. SECDEF will notify the Congressional committees of such approval.

DODDIR 7250.5 (NAVCOMPT 7133.1); DODINST 7250.10 (NAVCOMPT 7133.1); NAVCOMPTINST 7133.1

5.5.1 **Reprogramming Procedures.** Each request for reprogramming approval (DD Form 1415) includes an explanatory statement concisely setting forth the need for the reprogramming. These statements must contain all the details necessary for critical reviewing by authorities and Congressional committees. The action must identify all compensating increases and decreases with the appropriation total so that the net effect is zero for the individual reprogramming proposal. This does not apply when the reprogramming involves a transfer of funds into or out of the appropriation, a difference which would then show up as a net change to the appropriation total.

All reprogramming actions for RDT&E involving prior approval or notification of Congressional committees will be reviewed by USDRE 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 OASD(C).

5.5.2 **Reprogramming Hearings.** Periodically throughout the year, reprogramming hearings are conducted by Congressional committees.

5.5.3 **Reprogramming Reports.** A semiannual reprogramming report, submitted to Congressional committees, summarizes all reprogramming actions approved during the period, including those which did not, individually, require submission of reprogramming proposals to the Congressional committees. This report is prepared by ONR on DD Form 1416, "Report of Programs."

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.

DODDIRS 7600.2 (SECNAV 7510.7), 7650.2; DODINST 7600.3 (SECNAV 7510.7); SECNAVINSTS 5741.2, 5741.3, 5741.6, 7510.7;

5.6.1 **General Accounting Office (GAO).** The 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. He makes an annual report to the Congress plus special reports as needed. In these reports he makes "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 Comptroller General such information regarding the powers, duties, activities, organization, financial transactions, and methods of business of their respective offices as he may require . . .

In former times, audits by the General Accounting Office tended to emphasize the legality of transactions. GAO audits were focused on accounting matters, particularly whether expenditures were made in accordance with the law and intent of Congress. In recent times, emphasis has increasingly been on the question of how

efficiently, effectively, and economically government business has been conducted.

5.6.2 **Navy Audit Program.** The Navy Audit Program encompasses 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 the kinds of deficiencies which would be of interest to an external auditor—GAO, for instance—but also with providing management with the information needed 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 amendments of 1949 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 Office of the Comptroller of the Department of Defense, there is an assistant Comptroller for Audit. Within the Department of the Navy, the Comptroller is responsible for auditing; such audit functions are performed by the Auditor General of the Navy.

Contract audit involves the examination of books and records of private contractors and verification of their cost representations insofar as work with the Navy is concerned. Contract audit also provides 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

31 U.S.C. 665 (Section 3679 of the revised statutes, as amended by Section 1211 of Public Law 759, 81st Congress) relates to apportionment and control of appropriated funds. DODDIR 7200.1 cautions all "officers and employees of the Department of Defense who are authorized to obligate or expend Federal funds . . . to become thoroughly familiar with the provisions of" this law. It is available as attachment 1 of DODDIR 7200.1.

31 USC 1301, Public Law 93-433 "Congressional Budget and Impoundment Control Act of 1974."

DODDIR 7250.5, "Reprogramming of Appropriated Funds," states DOD policy with respect to 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.

DODDIR 7410.4 (NAVCOMPT MANUAL VOL V), "Regulations Governing Industrial Fund Operations."

DODDIR 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."

SECNAVINST 7510.7, "Department of the Navy Audit Manual for Management," together with its enclosures, DODDIR 7600.2, "Department of Defense Audit Policies," and DODINST 7600.3, "Internal Audit in the Department of Defense," promulgates basic policies and responsibilities for audit within the Department of the Navy.

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

CHAPTER 6 EXECUTION OF R&D EFFORT

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CHAPTER 6
EXECUTION OF R&D EFFORT

This chapter covers the execution of R&D effort. It is concerned with establishing and administering the arrangements under which performers, whether in-house or under contract, get the job done.

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 and, by doing so, obtain the best mix of cost, performance, and schedules.

- Encourage competition, when possible, with due consideration to the impact of present contracts on competition in the future. Whenever feasible, Government contracts are awarded on the basis of fixed-price bids in answer to formal advertising. However, it is recognized that research and development contracts must provide for reasonable flexibility and are therefore accomplished by negotiation rather than formal advertising. The obligation to obtain maximum competition still remains.

- Provide as effectively as possible for the long-term capability of the Government to competently plan and manage its R&D programs. Thus Government facilities must carry a reasonable part of Research and Exploratory and Advanced Development if they are to be knowledgeable customers for later development by industry.

- Increase the number of qualified performers by providing advance information on capabilities which are likely to be required in the future. The Navy Acquisition Research and Development Information Centers (NARDICs) provide points for dissemination of R&D planning information where industry representatives may review R&D documents. See Appendix D for information on NARDICs.

6.1.2 Environmental Impact Statements. The Environmental Policy Act of 1969 required that, on every major Federal action which significantly affects the quality of the human environment, a detailed statement of that impact be prepared. Copies of these statements must be made available to the Council on Environmental Quality, established in the Executive Offices of the President pursuant to the Act, and to the public.

Environmental impact statements must be prepared on the initiation of development of new weapon systems, or modernization of existing systems, in which use in peacetime may adversely affect the environment. They also are required on programs for weapons testing.

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*DODDIRS 5100.50, 6050.1; OPNAVINST 5090.1**

6.1.3 Basic Roles in Execution. The acquisition process may involve these roles in the User-Supplier dialog and interaction (2.2.9) so essential to an effective RDT&E process:

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*The DAR replaces the Armed Services Procurement Regulations (ASPR). See Selected References at end of chapter.

*For additional information on subjects discussed in this Guide, consult the listed references. Titles, current editions, and promulgation dates of directives on which this edition is based can be found in the Master Reference List following the appendixes. When a DOD directive has been promulgated as an enclosure to a Navy directive, the promulgating directive is shown in parentheses following the DOD listing.

- The "Technical Customer" (the User) is the official or organization with the requirement. This chapter is written from the perspective of the Technical Customer who is the RDT&E 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 and other regulations.
- The User role in the User-Supplier relationship may be played by the Technical Customer alone in an in-house acquisition, or by 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.

FAR Parts 8 and 35

6.1.4.1 In-house performers. Government-owned, Government-operated (GOGO) laboratories are the principal in-house performers, accounting for approximately 30% of the Navy's RDT&E program. In addition, the RDT&E manager may use various staff elements of his command.

In-house performance involves the least formal and least time-consuming preliminaries. After an informal dialog 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 two-thirds of the entire RDT&E program.
- Educational and other nonprofit institutions whose primary purpose is the conduct of scientific research are the primary performers of fundamental research.
- Federal Contract Research Centers (FCRCs) operate like in-house laboratories but are actually contractor-operated facilities. The only current Navy FCRC is the Center for Naval Analyses operated by the Hudson Institute.

6.1.5 Other Execution Means. There are several other means for execution of RDT&E effort in addition to Navy in-house laboratories and contractors. Funds may be transferred to another Government agency — such as NASA, Army, Air Force, National Bureau of Standards, HHS, National Academy of Sciences, National Institutes of Health, or National Security Agency. Under our Military Assistance Program, foreign research programs showing promise may be recipients of cost sharing or aid contributions which entitle us to share in results, reports, and other data. NATO-coordinated production arrangements which aid weapons standardization of our allies may entitle us to data and production items.

6.1.6 Major Laboratory Functions. The role of the in-house laboratories in carrying out RDT&E effort 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 are "corporate assets" available to all RDT&E managers and decision makers in need of their capabilities.

6.1.6.1 Technology base. The Navy's in-house laboratories are the principal repository of the Navy's scientific and technological expertise. This expertise is developed and maintained primarily through the Research and Exploratory Development programs and is exploited in the conception of advanced systems, product improvements to weapon systems, and resolution of fleet deficiencies.

IR/IED, discussed in paragraph 6.2.6, plays a vital role in development of the 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 the actual development is performed by industry under contract. Laboratory responsibilities for these programs may be total program management responsibility, deputy project management, or technical direction. The criteria for determining the scope of laboratory responsibility for an Advanced Development program include the extent to which technology has been developed and the system conceived by the laboratory and 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 feasibility studies and other aspects of the concept formulation process; development of plans such as the Acquisition Plan, the Integrated Logistics Support (ILS) plan, etc.; development of specifications; provision of experts for the proposal evaluation and source selection process; development of subsystems for which industry does not have adequate capability; systems development for selected programs; and test and evaluation. Thus the laboratory expertise ensures that the Navy can enter into contract negotiations as an informed buyer.

The laboratories may also be called upon to 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 RDT&E managers. The availability of this base of 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, DSARCs, etc. for an independent technical assessment of the program.

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

Government policy for implementation of RDT&E calls for performance of RDT&E 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, each wholly justified when considered on its own merits, may, when taken together, 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 (6.1.6).

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

6.2 EXECUTION 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 arrangement, monitoring, and funding of performance.

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.

NAVMAT Instruction 5450.27, "CNM Commanded Laboratories and Centers; missions and functions of," defines missions, functions, and leadership areas of the major laboratories under the command of the Chief of Naval Material. It indicates the laboratory where the primary capability is maintained in those technologies of importance to naval developments. NAVMAT P-3999, the **Navy Technical Facility Register,** a compendium of information on Navy RDT&E

activities, constitutes a centralized source of information on the type and capability of major equipment and facilities located at the activities.

Another very effective strategy is to request the Defense Technical Information Center to do a search of its collection of abstracts (DD 1498, "Research and Technology Work Unit Summary") of current work to identify work most closely related to the technical need (D3.1.1). The Technical Customer can then contact either the sponsor of the work or the Principal Investigator.

NAVMATINST 5450.27; NAVMAT P-3999, Navy Technical Facility Register

6.2.2 Negotiation with Laboratories. When an in-house laboratory performs a task, the process of "negotiating the contract" is relatively simple (see 6.1.4.1). The basic agreement is worked out through informal negotiations by the principals involved on both sides. 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). If the customer wishes to fund the proposal or modify it, he prepares a task assignment to the laboratory in letter form or in a format specified by the individual Systems Command.

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

6.2.3 Funding. The major RDT&E activities of the Navy operate under the Navy Industrial Fund (5.3.4.1). When an agency of the Department of Defense orders RDT&E work or services from an NIF facility, a work request (NAVCOMPT Form 2275) is used. Funds to support work requests are obligated by the sponsor upon acceptance by the NIF activity.

For RDT&E activities not operating under NIF, BUMED laboratories for example, the management command issues an annual operating budget (5.3.4.2). This budget does not obligate the funds of the management command. Sponsors outside the management command may order work from these activities by using a work request (NAVCOMPT Form 2275). Acceptance of the document by the activity obligates the sponsor's funds.

6.2.4 "Contracting" with In-House Laboratories. Tasks are assigned to in-house organizations though work requests. Work requests document an agreement with a laboratory or other in-house organization for performance of 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 to be done, it is normally supplemented by an amplifying letter or task assignment document.

DODINST 7220.1; Marine Corps Order 3900.11

6.2.5 Monitoring and Progress Reporting. The principal means by which customers keep track of work being performed for them by the laboratories are informal phone contacts and visits, both by the customer to the laboratory and by performers to the customer's organization.

6.2.6 Navy Laboratories IR/IED Program. Under the IR/IED (Independent Research/ Independent Exploratory Development) Program, funding is provided to each CNM laboratory for projects initiated and managed by the laboratory. The principal objective of the IR/IED Program is to provide a means for capitalizing immediately (i.e., outside the normal budget cycle and process) on in-house generated ideas for solution of Navy and Marine Corps problems.

NAVMATINST 3920.3

6.3 EXECUTION BY OUT-OF-HOUSE ORGANIZATIONS

This section describes the overall process of executing a major program through contracting with industry.

6.3.1 Federal Acquisition Regulation (FAR). The FAR is the government-wide acquistion regulation containing acquisition policies, procedures, contract clauses, and forms. Part 35 is on 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).

6.3.2 Necessity for Visible Propriety. Contracting is public business and must be conducted with scrupulous regard for the rights of all competitors. All competitors have the right by law to be informed of the outcome of contracts, the basis of the award, and the specific grounds for nonselection. This information must, by law, be maintained in an official contract file.

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

FAR 4.801

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 supplies, research and development, and services with small business concerns wherever such businesses are capable of participating in the Navy's programs.

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

6.3.4 The Formal Advertising Requirement. Despite the general recognition that research and development contracting is not suited to formal advertising, Federal statute requires that the use of negotiation be on an exception basis. The Federal Acquisition Regulation (FAR) lists the 17 exceptions to the formal advertising requirement; of these, four are generally applicable to R&D:

Exception 3 — for purchases aggregating not more than $25,000.

Exception 5 — for service to be rendered by any college, university, or other educational institution.

Exception 6 — for property or service to be acquired and used outside the United States and its territories, possessions, and Puerto Rico.

Exception 11 — for experimental, developmental, or research work, or property for experimental, development, or research work.

Before negotiation of a contract under exception 11, a "Determination and Findings" (D&F) must be made by an official authorized to make such D&F for contracts of the nature and amount involved.

When exception 11 is used for acquisitions over $5 million, the D&F must be signed at the Secretarial level. A "Request for Authority to Negotiate" (RAN) must be forwarded to Headquarters Naval Material Command (MAT 022) for processing and routing to ASN(R,E&S) and ASN(S&L) for approval.

Unless limited by higher authority, the Contracting Officer may make the determination and findings for contracts under $5 million. A "class D&F" may be issued to cover all procurements required in execution of a single program; for example, all the Exploratory Development tasks required for Concept Exploration for a system. Authority to negotiate may be requested as a part of an initial or updated SCP/DCP/NDCP submission.

Information copies of procurement requests with other identifying information must be sent by the Contracting Officer to ASN(R,E&S), via MAT 02, prior to signing the D&F, for procurements between $100,000 and $5 million.

10 U.S.C. 2304(a) (1) through (17); FAR 15.2 and 15.3; NARSUP 15.393, NAVMATINST 3900.3

6.3.5 Overview of a Major Development Program. A major program almost always 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 — there are exceptions — they participate in some capacity in most major programs.

For example, a major program such as a new carrier fighter, in addition to the prime contract, will involve a number of contracts with industry 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 the definition of the system,

preparation of specifications, evaluation of proposals and bidders, monitoring the performance of contractors, and in providing technical assistance in solving problems in the laboratories' area of technical expertise. 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 industry. Similarly, industry may subcontract some portions of a contract to Government laboratories or shipyards.

6.3.6 Execution Functions. The functions listed below are basic to the execution of all R&D effort, and the remainder of the chapter is concerned with the means to accomplish these functions:

- Acquiring an adequate base of performer candidates.
- Selection of best qualified participants.
- Establishment of performance agreements.
- Conveying of Government-furnished inputs.
- Performance of contract.
- Monitoring and reporting on execution.
- Compensation of performers.

6.3.7 Acquisition Planning. A formal Acquisition Plan (AP) is required when estimated development costs are $2 million or more, or when production costs are $5 million or more for any fiscal year or $15 million or more overall.

The AP is prepared at the time of assignment of the PDA (Principal Developing Activity) and submitted for approval no later than the time the item first appears in the FYDP. The AP is prepared by the Project Manager in consultation with the Contracting Officer and is signed by both these officials.

Acquisition planning covers such issues as funding, methods of contracting, source competence and source selection, contract type, competition, delivery, Government-furnished property, future requirements, and contract administration. The Acquisition Plan which begins as a broad outline is expanded and refined as the program goes along.

DFARS 7.1; NARSUP 7.1

6.3.8 Alternative Contracting Procedures. Execution/acquisition is arranged through many different scenarios, of which these are the major ones:

6.3.8.1 Two-step formal advertising. Unlike formal advertising, two-step formal advertising is sometimes a useful approach to research and development contracting. Step one involves solicitation and submission of technical proposals submitted without pricing information. In step two, fixed price bids are then invited from firms submitting acceptable technical proposals, and the award is made to the lowest bidder.

FAR 14.5

6.3.8.2 Competitive negotiation. Competitive negotiation is the normal means for procurement of R&D effort (see 6.6).

6.3.8.3 Noncompetitive negotiation. Negotiation with a single prospective contractor may be initiated by either an unsolicited proposal or solicitation on the part of the Government.

The Government may solicit a proposal from a single source when there is no substantial question as to the choice of source; e.g., when only one organization possesses the necessary qualifications (see DFARS 35.007(b)).

An unsolicited proposal is a written offer to perform effort submitted without Government solicitation in the hope of obtaining a contract. Unsolicited proposals are a valuable means through which unique, innovative, or meritorious ideas may be made available to the Government. Accordingly, it is important that such proposals be handled in a proper manner, procedurally, and in such a way that prospective contractors are encouraged to disclose to the Government ideas they have originated, conceived, or developed. Detailed policies and procedures for dealing with unsolicited proposals are contained in FAR 15.5.

FAR 35.007(i) states:

> (i) In circumstances when a concern has a new idea or product to discuss that incorporates the results of independent R&D work funded by the concern in the private sector and is of interest to the Government, there should be no hesitancy to discuss it; however, the concern should be warned that the Government will not be obligated by the discussion. Under such circumstances, it may be appropriate to negotiate directly with the concern without competition. Also see Subpart 15.5 concerning unsolicited proposals.

FAR 15.5 and 35.006

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

SECNAVINST 3900.37; OPNAVINST 3900.22

6.4 CONTRACTING TECHNICAL ASSISTANCE

This section discusses major sources of technical assistance available to help carry out the acquisition process.

6.4.1 The Acquisition Team. A complex acquisition requires not only the closest cooperation 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 on its own staff, they can generally be acquired from the laboratories.

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

See the organization manual for the command. Also consult the organization's phone book to find the most likely points of assistance within the contracts directorate.

6.5 CONTRACTS AND OTHER ACQUISITION INSTRUMENTS

6.5.1 Grants. The Department of Defense is permitted by law to use grants in support of basic research. Within the Department of the Navy, the Office of Naval Research has been delegated 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:

FAR Part 16; 35.006

6.5.2.1 Cost-sharing contract. Under a cost-sharing contract the contractor is reimbursed for an agreed portion of his allowable costs, not to exceed an established ceiling.

6.5.2.2 Cost contract. A cost contract calls for the Government to pay all allowable costs involved in executing a given research project. This type of contract establishes an estimate of the total cost for purposes of (1) obligating current funds, and (2) establishing 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-a-fixed-fee contract is similar to the cost contract in that it provides for payment to the contractor of all allowable costs as defined in the contract, and establishes an estimate of the total

cost; in addition, however, it provides for payment of a fixed fee based on the nature of work to be performed and upon 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 contract with provision for a fee which is adjusted by formula in accordance with the relationship which total allowable costs bear 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, can also be the basis for contract incentives.

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 which final negotiated total cost bears 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 cost experience of the contractor in performance of the contract. This type of contract, when appropriately applied, places maximum risk upon 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 for use in procurements when reasonably 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 purchases under $25,000. Purchase orders are used only when supplies or services are bought on a fixed-price basis.

6.5.2.8 Letter contract. A letter contract is an interim type of contractual agreement which authorizes start of work prior to award of a formal contract. Letter contracts are used only when a definitized contract cannot be negotiated and awarded soon enough to meet the acquisition need. Letter contracts are the least desirable contracting approach, require NAVMAT approval prior to their issurance, and must be followed by definitized contracts.

Note: The types of contracts described in 6.5.2.5/6/7 are considered not desirable for efforts involving technical risk and are not generally preferred vehicles for major R&D programs.

6.5.3 Specifications. Specifications are clear and accurate descriptions of the technical and other requirements established for supplies or services being procured. They may also 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.

There are two general types of specifications. 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. Most procurements employ a combination of the two types by indicating certain design features that must be incorporated (such as kinds of materials to be used) and performance characteristics.

Items for which there is a repetitive demand are described by standard specifications which are known as Federal or Military specifications. Federal specifications cover items used by at least two 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 are often quite voluminous, are usually incorporated 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 are available through normal distribution channels and 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 which describes the work to be done. While most other contract clauses are primarily 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), which is prepared by the Technical Customer, will be suitable for use as the contract work statement.

In preparing work statements, these elements are to be considered:

- A general description of the required objectives and desired results.
- Background information to clarify the requirements and show how they evolved.
- Technical considerations such as known specific phenomena or techniques.
- A detailed description of the technical requirements and subordinate tasks.
- A description of reporting requirements and any other deliverable items, such as data, experimental hardware, mockups, prototypes, etc.
- Other special considerations.

FAR 35.005(d)

6.5.5 Other Contract Provisions. Federal law and DOD and Service regulations require the inclusion of a variety of clauses in contracts. A number of them are clauses that 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 handled 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 the development and exploitation of technology.

6.5.5.1 Patent rights. Contracts calling for the performance of experimental, developmental, or research work are required by FAR to include a patent rights clause which defines the rights and obligations of the contracting parties with regard to inventions that are conceived or first actually reduced to practice in the course of the contract. With few exceptions, Government patent policy provides title to the contractor and a license for use of the invention to the Government.

FAR 27.2, 27.3

6.5.5.2 Data acquisition and data rights. It is imperative that all R&D contracts carefully specify the data to be delivered. In planning a developmental procurement, when subsequent production contracts are contemplated, consideration should be given to the need and time required for obtaining a procurement package. The term "procurement package" means plans, drawings, specifications, and other descriptive information and data necessary to achieve competition in production contracts.

Contracts under 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 computer software and technical data requirements of a contract appear on the DD Form 1423, "Contractor Data Requirements List," and set forth the technical data and computer software that are actually required to be furnished by a contractor. The "computer software and data clause," on the other hand, is a special contract clause which defines 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, preservation, and updating of computer software and data is an expensive process, it is general policy to acquire the 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.

DFARS 27.4; FAR 35.011; NAVMATINST 4000.15

6.5.5.3 Independent Research and Development (IR&D). FAR permits Defense contractors to charge some of their corporate research and development costs as overhead on Defense contracts. The amount to be allowed and the nature of the work to be pursued are negotiable. Work performed under this IR&D provision has, in the past, played a vital role in developing the technology base for future systems.

DODINST 3204.1; SECNAVINST 3900.40; NAVMATINST 3900.11; FAR 31.205-18

6.5.6 Contracting for Research and Exploratory Development. By nature and definition, research and exploratory development involve effort to extend knowledge of nature's laws and of its useful applications. Since the end result normally cannot be foreseen, contracts for such 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).

FAR 35.005(a), (b), (c)

6.5.6.1 Full disclosure policy. R&D contracts are required to contain clauses that allow the Government to use information provided under the contract without restriction.

FAR 35.010

6.5.6.2 Government equipment for universities and other nonprofit institutions. Government policy encourages educational and nonprofit institutions to maintain a high level of effort in basic technologies to enhance our long-range scientific knowledge. Where equipment or facilities exceeding the Government's need are available for disposal, such items may be approved for retention by the educational and nonprofit institutions in accordance with existent disposal regulations. Similarly, the Government encourages the transfer of title to equipment purchased with contract funds to educational institutions.

DODDIR 3210.2; FAR 35.014(b)

6.6 PROCUREMENT THROUGH COMPETITIVE NEGOTIATION

Competitive negotiation, as stated previously, is the normal means by which R&D effort is procured (6.3.8.2).

SECDEF initiated as a pilot program in FY 76 a "Four-Step Source Selection Concept" intended to improve the process. The four-step process includes:

- Contract seekers submit technical proposals, each of which is evaluated and discussed with the submitter. Technical points which need clarification are brought up, but deficiencies are not in order to prevent "technical leveling" — the passing of technical information from one competitor to another.
- Cost/price proposals and clarifications of technical proposals are submitted and discussed to ensure clarity, complete understanding of Government requirements, etc. Competitors whose proposals are not within the competitive range are notified and their proposals eliminated from consideration.
- A common cutoff for receipt of proposals and clarifications is established and promulgated. All proposals are evaluated and the source(s) selected. "Auctioning" through repetitive calls for offers is prohibited.
- Final negotiations with the selected source(s) are conducted, leading to a definitive contract award(s).

Four-step procedures are not used for procurements below $2 million and in certain other excepted cases.

DFARS 15.613

6.6.1 Procurement Request (PR). The procurement request (PR) is a document prepared by the Technical Customer to initiate the contracting process. Ideally, the PR should provide a complete and technically adequate statement of what

is required, which can be used first in the solicitation document (RFP/RFQ) (6.6.2), and later in the contract work statement (6.5.4). Assistance is generally available from the contracts group to help the Technical Customer prepare this all-important document.

Normally, the PR is extensively coordinated and reviewed 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 which advises prospective performers of Government needs is termed a Request for Proposals (RFP) or a Request for Quotation (RFQ). The technical difference between the two is that the RFQ is used when bilateral negotiation will be conducted before a binding contract will exist. For the RFP, however, the Government reserves the option to award the contract on the basis of the proposal without further negotiation. Primary responsibility for preparation of the RFP/RFQ and associated information, which is collectively termed the "bid package," rests with the Contracting Officer.

The technical heart of the solicitation document is the prospective work statement from the PR which should provide the prospective contractor with a comprehensive insight into the technical factors, criteria, and/or problems which he should consider in preparing his proposal and which the Government will use in proposal evaluation. It is essential that this part of the PR be comprehensive and clear in order to ensure that all contractors solicited have a common understanding of the requirement and the proposed method of evaluation.

NAVMATINST 5000.17

6.6.3 Promulgation of Solicitation Documents. In general, the RFP/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 on the PR organizations known to have the technical capabilities required to carry out the development.

Since proposals may be both costly and wasteful of scientific and engineering manpower, FAR 35.007(a) limits solicitation to sources judged to have the basic technical qualifications to perform the specified work. The solicitation is also synopsized in the Department of Commerce publication, the *Commerce Business Daily*. Firms learning of the solicitation through the Commerce Daily may also request an RFP/RFQ.

A presolicitation conference may be held with potential contractors prior to promulgation of the RFP/RFQ to clarify any questions concerning the proposed contract and to elicit the interest of prospective contractors to participate.

The information in the bid package may be supplemented by a "bidders conference." This is a meeting of prospective bidders arranged by the Contracting Officer to answer questions of prospective bidders and generally assist them in understanding the Government's requirements.

FAR Part 5, 35.004, 35.007(a) and (b)

6.6.4 Evaluation of Proposals and Bidders. Evaluation leading to selection of the performer encompasses both proposals and a large 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 probable ability of the bidders to perform technically.

In determining the technical capability of prospective contractors, the following must be 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, or other technical personnel.
- The availability, from any source, of necessary research, test, and production facilities.
- Experience or pertinent novel ideas in the specific branch of science or technology involved.

- The contractor's willingness to devote his resources to the proposed work with appropriate diligence.

- The contractor's management capabilities, cost controls, and record of past performance.

DODDIR 4105.62 (NAVMAT 4200.49); NAVMATINST 4200.49; FAR 35.008

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 the task. What is sought is a contract most advantageous to the Government, price and other factors considered. FAR makes it clear that in awarding R&D contracts, basic policy should be interpreted to favor award "to that organization, including any educational institution, that proposes the best ideas or concepts and has the highest competence in the specific fields of science or technology involved." (FAR 35.008(a).) Cost should, or course, 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. (FAR 35.008(e).)

DODDIRS 4105.62 (NAVMAT 4200.49); NAVMATINST 4200.49; FAR 35.008

6.7 MANAGEMENT ACTIVITIES DURING EXECUTION

This section covers monitoring, reporting, inspections, acceptance of products, and other functions related to the execution of R&D effort, particularly that performed under contract.

6.7.1 Management Control Systems. The contractor is responsible for timely and satisfactory performance of his contract. At the same time, however, the Government monitors contract performance to ensure that the desired results are accomplished as scheduled.

The general policy is that management control information should be generated from data actually utilized by contractor operating personnel and provided in summarized form for successively higher level management and monitoring requirements. Contractor management information/ program control systems and reports should be utilized as much as practicable. Government-imposed changes to contractor systems should be limited to those necessary to satisfy established DOD-wide standards.

The management control system (reporting) requirements which can be contractually imposed are limited to those systems listed in the current edition of DOD Manual 7000.6-M, "Acquisition Management Systems List (AMSL)."

The Manual has two listings: general application for use throughout DOD, and restricted application with various constraints on use. 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 acquisition management systems to be imposed on the contractor must be specified in the RFP and contract. These requirements must be listed on a DD Form 1660, "Management Systems Summary List," which is a part of planning documents, solicitations, and final contract. This form indicates the "tailoring," if any; 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 on DD Form 1423, "Contract Data Requirements List." In other words, there are constraints upon Navy acquisition managers both in the management systems that may be imposed and the data the contractor may be required to submit based on such systems.

The general intent of the policies is to keep down the cost of monitoring and reporting by limiting management control systems to those actually essential to fulfilling true Government needs.

DOD Instruction 7000.2, "Performance Measurement for Selected Acquisitions," is a general application system listed in the AMSL Manual which may be imposed on selected contracts for major programs. Implementation involves

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* of 1 October 1976, NAVMAT P5240.

DODDIR 5000.19 (OPNAV 5214.7); DODINST 7000.2 (SECNAV 7000.17); SECNAVINST 7000.17; NAVMATINST 7000.17; DOD 7000.6M, Acquisition Management Systems List (AMSL); NAVMAT P5240, Cost/Schedule Control Systems Criteria Joint Implementation Guide

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6.7.2 Technical Reports. Scientific and technical reports are documents written for the permanent record to document results of R&D effort. A completed DD Form 1473, "Report Documentation Page," must be included in each copy of a scientific or technical report required by a contract. Copies of all technical reports are furnished to the Defense Technical Information Center (DTIC) (see Appendix D for additional information on DTIC).

DODDIR 5200.20 (NAVMAT 5200.29); SECNAVINST 3900.29; MIL-STD 847A (SECNAVINST 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 his work. As a rule the contract defines a detailed reporting policy. Monthly reports in the form of letters are often required. Information submitted may include:

- The number and names of key personnel working on the project.
- Facilities used.
- Direction of the work.
- 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 is addressed to a distinctive need and user. For all three systems, costs are reported against the standard work breakdown structures (WBS) prescribed in MIL-STD-881.

6.7.4.1 Cost Performance Report (CPR). The CPR is designed to provide the Project Manager a means of collecting summary level cost and schedule performance data. It is required for selected major programs.

The CPR is primarily for use where the contractor's management control systems have previously been reviewed and accepted as complying with the cost/schedule control systems criteria of DOD Instruction 7000.2 (see paragraph 6.7.1).

DODINST 7000.10 (SECNAV 7000.15); SECNAVINST 7000.15

6.7.4.2 Contractor Cost Data Reporting (CCDR). Contractor Cost Data Reporting provides a consistent, uniform historical cost data base for:

- Preparing independent cost estimates for major weapon systems acquisitions to be reviewed by the Defense Systems Acquisition Review Council (DSARC).
- 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 data collected provide a common data base for cost estimating within the DOD. CCDR is mandatory for all new major programs and acquisitions.

DODDIR 7000.11 (SECNAV 7000.20); SECNAVINST 7000.20; NAVMAT P-5241, Contractor Cost Data Reporting (CCDR)

6.7.4.3 Contract Funds Status Report (CFSR). The Contract Funds Status Report supplies funding data that, along with other performance measurement inputs, provide DOD management 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 is normally applicable to all contracts of over $500,000 in value.

DODINST 7000.10 (SECNAV 7000.15); SECNAVINST 7000.15

6.7.5 Administration of Contracts. Responsibility for administration of contracts is usually delegated to a contract administration office upon award. These offices include those established by the Defense Contract Administration Service (DCAS) of the DOD Defense Supply Agency, and those established by the military departments under the DOD Plant Cognizance Program.

The services they provide include contract administration, production and quality assurance, data and financial management activities (and administration of the industrial security program), contract compliance, and access to small business/labor surplus.

The Project Manager of a major project or of one meeting DODDIR 5000.1 dollar thresholds is required to have representation at or near the contractor's site. This representation may take the form of technical representatives assigned to existing DCAS offices or Contract Administration Offices of other Services.

The handbook, *DOD Directory of Contract Administration Services Components,* (DOD 4109.59-H), provides a list of DOD components performing contract administration services.

DOD 4105.59-H; DODINSTS 4105.59 (NAVMAT 4330.29), 4105.64 (NAVMAT 5300.5)

6.7.6 Selected Acquisition Report (SAR). The SAR is a standard, comprehensive, summary status report on major acquisitions. The report was developed to meet the requirements of management within the DOD as well as the needs of Congressional review. Technical, schedule, and program acquisition cost sections are the heart of the SAR. These sections show current estimates compared 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 are normally prepared only for projects designated by SECDEF as major acquisitions, although others may be specifically selected by SECDEF for SAR treatment. SARs are prepared by the Program Manager for submission through the Service Secretary to the Secretary of Defense. SECDEF then forwards selected reports as requested by the Senate and House Armed Services and Appropriations Committees for information. The General Accounting Office also receives copies of the SARs.

DODINST 7000.3 (SECNAV 7700.5); SECNAVINST 7700.5

6.7.6.1 Development and Production Acquisition Reports (DAR/PAR). The DAR/PAR is designed to be a simplified replacement for the SAR which has, over the years, become bulky and costly to prepare. Each DAR/PAR is limited to five pages. All SAR programs require a DAR Report between Milestones I and III or a PAR Report at Milestone III for the duration of the Program. The first DAR/PAR reports were submitted in December 83. After one year testing, SECNAV anticipates requesting Congressional approval for substituting the DAR/PAR for the more costly SAR reports.

NAVCOMPT NOTICE 7000 of 10/21/83

6.7.7 Other Reports. Several other reports are submitted by the Technical Customer.

6.7.7.1 Research and Technology Work Unit Summary (DD Form 1498). DD 1498 is used to report ongoing effort at the work unit level. Each work unit report is updated when a significant change occurs as well as annually.

DODREG 3200.12-R-1; SECNAVINST 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 ONR Comptroller in May in support of Apportionment Requests.

6.7.7.3 Reporting by laboratories/centers. Reporting by the CNR/CNM laboratories and centers consists of inputs to the DOD Work Unit Information System (DD 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 always be accomplished by the Contracting Officer.

6.8 EXECUTION OF MARINE CORPS R&D

MCOS 3900.3, P5000.10; NAVMATINST 3910.16

6.8.1 Alternative Execution Means. Acquisition of R&D to meet Marine Corps needs can be accomplished in a number of ways:

- By direct acquisition of services 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 will conduct.
- By officially indicating interest in a development program which is totally funded by another Service.

The primary consideration determining the mode of acquisition is whether the end product is required by the landing forces in amphibious operations. If so, the development is a Marine Corps responsibility and will be funded and controlled by the Marine Corps, either directly by procurement of 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 lies with each element of the HQMC staff organization. The office of the Deputy Chief of Staff (Research, Development and Studies) coordinates and integrates the conduct of implementing actions by the other staff elements. Additionally, DC/S (RD&S) serves as the official point of contact for R&D matters between HQMC and all 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 capabilities as a program financed by the Marine Corps. In such a case, the Marine Corps devotes as much management attention to the former as to the latter.

6.8.4 Role of the Development Center. The Development Center of the Marine Corps Development and Education Command 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, the Development Center'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, the Development Center's management role principally involves monitoring developmental efforts to insure 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:

- Assistance in developing and updating the Marine Corps Long-Range Plan, Mid-Range Objective Plan, and the material objectives that flow from them.
- The identification of the development efforts (exploratory, advanced, engineering) and the technical requirements necessary to attain them.
- The formulation (in conjunction with the Marine Corps Development Center of the Marine Corps Development and Education Command) of tentative development programs to implement Marine Corps requirements.
- Acquisition of programs approved and funded to meet these requirements or the monitoring and providing of scientific/technical guidance on programs concerned with Marine Corps requirements but conducted by other Services.

SELECTED REFERENCES ON CONTRACTING AND EXECUTION OF R&D EFFORT

Federal Acquisition Regulation (FAR), Part 35, "Research and Development Contracting." (See 6.3.1)

DODDIR 4105.62 (NAVMAT 4200.49), "Proposal Evaluation and Source Selection."

DODINST 7000.3 (SECNAV 7700.5), "Selected Acquisition Report (SAR)."

SECNAVINST 3900.37, "Rapid Development Capability for Warfare Systems; establishment of."

NAVMATINST 3920.3, "In-House Laboratory Independent Research (IR) and Independent Exploratory Development (IED) Programs."

NAVMATINST 5450.27, "CNM Command Laboratories and Centers; mission and functions of."

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.

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

CHAPTER 7 TEST AND EVALUATION

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CHAPTER 7
TEST AND EVALUATION

This chapter deals with tests and the evaluation of resulting data, particularly those which are needed in order to provide information on which decisions related to the development or deployment of new weapons and equipment are based.

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 AND 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" are most often found together, they actually denote clearly distinguishable functions in the RDT&E process. "Test" denotes the actual testing of hardware/software — models, prototypes, production equipment, computer programs — to obtain data, including software, valuable in developing new capabilities, managing the process, or making decisions on the allocation of resources. "Evaluation" denotes the process whereby data are logically assembled and analyzed to aid in making systematic decisions.

Test and evaluation involve the deliberate and rational generation of data concerning the nature of the emerging system and the creation of information useful to the technical and managerial personnel who control development. In the broad sense, T&E may be defined as all physical testing, experimentation, and analyses performed during the course of research, development, introduction and employment of a weapon system or subsystem, and all analytical or evaluative studies performed using the data generated.

7.1.2 Functions of T&E. Test and evaluation are integral to the development of systems and equipments. Testing provides information for a number of purposes and several different classes of information users. Tests provide information for the following purposes:

7.1.2.1 Information for development. Testing of systems under development is an inherent aspect of the R&D process through which technical uncertainties and problems; e.g., in reliability, are identified and resolved. While information on such problems is generated primarily through testing by the developer, various tests by the Government generate information useful in the design-test-evaluate-redesign process which is basic to the development of reliable material.

7.1.2.2 Information for acquisition milestone decisions. Many of the major milestone decisions in the life of a development, such as decisions to initiate development, to conduct full-scale development, or to procure a system for inventory, are by nature investment decisions. In making these decisions, the decision makers (such as SECDEF where the DSARC is involved) 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, personnel, etc (see 2.5.4).

T&E must provide, as a basis for these decisions, the best information possible concerning the operational effectiveness, operational suitability (including reliability, operational supportability, organization, doctrine and tactics for system deployment), of the prospective system, its needs for modifications or further development, and data useful to management in estimating the probable cost of completing development, acquisition, and ownership.

7.1.2.3 Information for effective operational utilization. The operating forces constitute another set of users of information developed through test. One output of operational evaluation efforts is the development of tactics and doctrine for the most effective utilization of the system.

7.1.3 Policy on T&E. Basic policy calls for a development strategy based on periodic performance demonstrations. Programs are to be structured and resources allocated to ensure that the demonstration of actual achievement of program objectives is the pacing function.

A basic policy for tests which provide information for acquisition milestone decisions is the concept of the "independent evaluation." An organization with a vested interest in "selling" the system under development is not to have unilateral control of the establishment of test requirements, the conduct of tests, or evaluation of the results. The operating forces and the "buyer" of the system (for example, SECDEF for a major program) play a key role in determining test requirements and must, of course, have access to an independent evaluation of test results.

Assessment of operational effectiveness and suitability through initial operational test and evaluation (IOT&E) *before* the major production decision is basic policy. This IOT&E must be an evaluation by the appropriate independent test organization: Operational Test and Evaluation Force (OPTEVFOR) or Marine Corps Operational Test and Evaluation Activity (MCOTEA).

The principle of independent evaluation has always 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 and aircraft are performed by the Board of Inspection and Survey (BIS or INSURV). Both of these organizations report to the Chief of Naval Operations for these functions.

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).

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*DODDIRS 5000.1, 5000.3; DODINST 5000.2; SECNAVINST 5000.1; OPNAVINSTS 3960.10, 5000.42**

7.1.4 T&E in the Acquisition Cycle. T&E is an integral part of the acquisition process, not something that occurs after the R&D is completed. T&E begins in the very 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. The role of T&E throughout the acquisition process is shown in Figure 2-3.

DODDIR 5000.1, SECNAVINST 5000.1

7.1.5 Congressional Interest in OT&E. The general policy of adequate operational test and evaluation (OT&E) is strongly supported by the Congress. A provision of the Authorization Act of 1972 called for the submission of data on all OT&E completed on every system for which procurement funds are requested. This basic policy has been incorporated in each subsequent Act. (See Appendix G, Section G1 for excerpts from applicable statutes.) Congress emphasized its continuing concern for adequate OT&E by including in the 1984 act a requirement for a Director of Operational Test and Evaluation (DOT&E) confirmed by the Senate and reporting directly to SECDEF. (See 7.2.1.2)

7.1.6 Waiver of T&E Requirements. Although it can be done, obtaining waivers for T&E called for in approved plans has been purposely made difficult. Only the Secretary of Defense can grant waivers to T&E outlined in an approved SCP/DCP/TEMP. Waiver of T&E outlined in the NDCP/TEMP for an ACAT IIS program may be granted only by SECNAV, Under SECNAV, or an ASN designated by SECNAV. Waiver of other T&E outlined in an approved Test and Evaluation Master Plan (TEMP) (see 7.5.3) may be approved only the CNO for ACAT IIC and below programs (see 2.5.2).

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*For additional information on subjects discussed in this Guide, consult the listed references. Titles, current editions, and promulgation dates of directives on which this edition is based can be found in the Master Reference List following the appendixes. When a DOD directive has been promulgated as an enclosure to a Navy directive, the promulgating directive is shown in parentheses following the DOD listing.

DODDIR 5000.3; OPNAVINST 3960.10

7.1.7 Approval for Production Milestones. There may be several Milestone III, "Production," decisions, particularly for very costly programs.

OPNAVINST 5000.42; NAVMATINST 5000.19

7.1.7.1 Approval for Full Production (AFP). AFP signifies that:

- The system has demonstrated, through TECHEVAL, the meeting of its technical thresholds.
- The system has demonstrated, through OPEVAL, both the meeting of operational 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 Limited Production (ALP). ALP signifies that all but a specific set of requirements for AFP have been met and that a plan and funding exists for meeting those requirements prior to the next year's production decision point.

7.2 ORGANIZATION FOR TEST AND EVALUATION

This section discusses the T&E responsibilities of officials and of some organizations with major roles in test and evaluation. More detailed information on this subject can be found in Appendix G.

7.2.1 T&E Responsibilities in OSD. T&E responsibilities in OSD are divided between the Director Defense Test and Evaluation and the Director of Operational Test and Evaluation.

7.2.1.1 Director, Defense Test and Evaluation (DDTE). As a focal point for development T&E, DDTE'S responsibilities include:

- Recommendations to SECDEF on all T&E policy matters.
- Assisting in the preparation of and/or reviewing the T&E section of SCP, DCP, and IPS.
- Monitoring T&E planned and conducted by DOD components on major acquisition programs and such other programs as deemed necessary.
- Initiating and reviewing T&E programs associated with joint tests conducted by DOD components.
- Reporting directly to the SECDEF at each program decision milestone for major defense systems (ACAT I) an assessment of T&E plans and accomplishments which justify the action recommended for that milestone decision.
- Fulfilling OSD responsibilities for the DOD Major Range and Test Facility Base (MRTFB) (see 7.3.5).

DODDIR 5000.3

7.2.1.2 Director, Operational Test and Evaluation (DOT&E). DOT&E serves as the principal staff assistant and advisor to the Secretary of Defense on OT&E and is the principal OT&E official within DOD. His focal point responsibilities include:

- Prescribing policies and procedures for operational testing.
- Monitoring and reviewing all OT&E within DOD.
- Coordinating OT&E conducted jointly by more than one Military Department or Defense Agency.
- Analyzing the results of OT&E and report to SECDEF and the Armed Services and Appropriations Committees of the Congress on
  - Adequacy of OT&E
  - Effectiveness and suitablity for combat of the items tested.
- Making recommendations to SECDEF on all budgetary and financial matters pertaining to OT&E, including the facilities and equipment.

- Approving OT&E plans for major defense acquisition programs.

DODDIR 5141.2

7.2.2 T&E Responsibilities at the SECNAV Level. The Secretary of the Navy, as head of the Department of the Navy under the direction of the Secretary of Defense, is responsible for the policies and control of the Navy, including weapon systems acquisition programs. SECNAV assigns general and specific RDT&E responsibilities to the Assistant Secretary of the Navy (Research, Engineering, and Systems) and to the Chief of Naval Operations.

DODDIR 5100.1 (SECNAV 5410.85); SECNAVINST 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 RDT&E (OP-098) in accordance with overall policies of the Secretary of the Navy.

T&E staff support for the Director RDT&E is provided by the Test and Evaluation Division (OP-983).

OP-983 is responsible for implementing the responsibilities of the Director RDT&E with respect to cognizance over planning, conducting, and reporting of 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.

OPNAVINSTS 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 — conducts acceptance trials of vessels and aircraft as directed by the Chief of Naval Operations. 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 additional duty to the Board of Inspection and Survey. The technical commands supply assistant inspectors for ship trials and inspections.

Article 0321, U.S. Navy Regulations, 1973; OPNAV- INSTS 5420.70, 3960.10

7.2.5 Operational Test and Evaluation Force (OPTEVFOR). 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. Results of OPTEVFOR evaluations are reported to CNO and SECNAV by COMOPTEVFOR and, when appropriate, to CMC.

With only a relatively modest number of personnel and resources on the east and west coasts, COMOPTEVFOR relies heavily on the facilities, resources, and personnel of the operating forces, the DA, and field activities for carrying out his mission in T&E projects assigned. He exercises operational control over Fleet units assigned for project support. Close liaison is authorized and exercised with appropriate elements of the Naval Material Commands, the Systems Commands, and other T&E organizations to facilitate test support and information flow in carrying out assigned projects.

Elements of OPTEVFOR are involved in varying degrees with all categories of RDT&E from basic research to evaluation of newly developed equipment and appraisal of systems already in Service use. Projects deal with aircraft, surface ships, submarines, and antisubmarine warfare systems. 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 with an early and independent operational assessment.

OPNAVINSTS 5540.47, 3960.10

7.2.6 T&E Responsibilities in NAVMAT. Responsibility for most T&E matters in Headquarters Naval Material Command (NAVMAT)

is in the Office of DCNM(A) (MAT-08). He is supported in his T&E functions by a small staff in MAT-08P2 acting as the NAVMAT T&E Coordinator.

The Assistant Commander for T&E, NAVAIR (AIR-06), is assigned as the Lead Systems Commander (Lead SYSCOM) for all Navy T&E training range and telemetry stations with the exception of special ranges assigned to DNL and NAVSEA.

OPNAVINST 3960.10; NAVMATINSTS 3960.6, 5401.2, 5430.60, 5460.2

7.2.7 T&E Focal Points/Coordinators. Responsibility for coordination of T&E matters in the designated PMs, Systems Commands, and CNM 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 detailed 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.
- Monitoring progress of test programs and recommending program readiness to proceed through successive phases of development.
- Attending Acquisition Review Board (ARB) meetings on certification of readiness for OPEVAL, adjudication of internal systems problems, and internal TEMP review.

7.2.8 Program Managers (PMs). The PM, under the CNM, is responsible for development and execution of 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 for performance of required T&E.

OPNAVINST 3960.10

7.2.9 T&E Coordinating Group (TECG). Complex, multifaceted programs may require extensive T&E coordination. To assist in this, a T&E Coordinating Group may be established. The members of a TECG should be the Program Coordinator, the Development Coordinator, the Program or Acquisition Manager, the OPTEVFOR Operational Test Director, the Logistics Coordinator, and others as appropriate (such as a PRESINSURV representative for ship and aircraft programs). TECG recommendations will be considered for inclusion in the TEMP.

OPNAVINST 3960.10

7.2.10 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 Deputy Chief of Staff for Research, Development, and Studies (DC/S RD&S), in accordance with overall policies of the Secretary of Defense and the Secretary of the Navy.

DODDIR 5000.1; SECNAVINST 5000.1

7.2.10.1 Development Center, Marine Corps Development and Education Command (MCDEC). Under the direction of CG, MCDEC, the Development Center has overall responsibility for implementation of policies, procedures, and requirements for development, development testing, and evaluation of all systems to be acquired by the Marine Corps. This broad responsibility is carried out in coordination with the Principal Developing Agencies (PDAs) of the Services when assigned. Systems assigned for DT&E to the Marine Corps Tactical Systems Support Activity (MCTSSA), including test bed systems, are the direct responsibility of CG, MCDEC. The Development Center also provides direct assistance to MCOTEA and FMF commands in the planning, conduct, and reporting of OT&E.

7.2.10.2 Marine Corps Operational Testing and Evaluation Activity (MCOTEA). As is the case with the other Services, operational testing, including IOT&E and FOT&E, must be conducted by a major field agency separated 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. MCOTEA is represented by a focal point for OT&E matters at Headquarters, Marine Corps in the RD&S Division.

MCO 3960.2

7.2.10.3 Fleet Marine Forces (FMF). T&E responsibilities of FMF include conducting OT&E under the direction of MCOTEA, supporting DT&E in coordination with CG, MCDEC, and providing personnel or units to participate in joint T&E as assigned.

MCOs P5000.10, 5000.11

7.3 TEST AND EVALUATION RESOURCES

This section presents information on policy, organization, and responsibilities associated with the resources essential to accomplishment of T&E programs including the range and test facility base, field RDT&E support, new test capabilities, and facilities and targets.

7.3.1 Capabilities of T&E Field Activities. Personnel responsible for T&E programs can determine the capabilities of appropriate T&E activities by review of referenced publications and by conferring with such agencies as the OPNAV T&E Division (OP-983), NAVMAT Systems Engineering Divisions, or the NAVAIR Assistant Commander for Test and Evaluation, Resources Division (AIR-610), PMs, and other offices experienced in T&E matters.

NAVMAT P-3999, Navy Technical Facilities Register; 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. The key factor in obtaining use of test ranges and other facilities is early contact with cognizant test facility personnel. Early liaison will assist in the definition of a practical test plan to be incorporated in the TEMP, and will allow the facility the leadtime required to provide the required support. Funding of such tests is discussed in paragraph 7.5.4.

DODDIR 3200.11 (OPNAV 3900.25); OPNAVINST 3900.25; NAVMATINST 3960.6

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.

In keeping with the funding policy for T&E (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 Assistant Commander for Test and Evaluation (AIR-06).

DODDIR 3200.11 (OPNAVINST 3900.25)

7.3.4 Land-Based Test Sites (LBTS). The complexity of modern systems and their attendant software and integration requirements have emphasized the value of LBTS to the development, integration, test, configuration management, and life-cycle support of many Navy systems. An LBTS is a facility duplicating or simulating as many conditions as possible of a system's planned operational installation and utilization.

NAVMATINST 3960.8

7.3.5 Major Range and Test Facility Base (MRTFB). The mission of the MRTFB is to provide a broad range and test support base to all DOD components and other authorized users responsible for RDT&E and operation of material and weapon systems.

The MRTFB is composed of 19 DOD major ranges and test facilities, which are managed by the military departments and monitored for OSD by the Deputy Director (Test and Evaluation).

The Director Test and Evaluation Division (OP-983) is responsible for management of Navy elements of the MRTFB at the OPNAV level. Within the Naval Material Command (NMC), the NAVAIR Assistant Commander for Test and Evaluation (AIR-06) is assigned responsibility for the planning, support, and (for designated activities) management of the Navy elements of the MRTFB.

DODDIR 3200.11 (OPNAV 3900.25); OPNAVINST 3900.25

7.3.5.1 Elements of the MRTFB. Each of the elements listed below is operated by one of the Services. Those marked with an asterisk are National Ranges and have responsibility for meeting the needs of all DOD users.

- Navy elements
  - Pacific Missile Test Center*
  - Atlantic Undersea T&E Center
  - Naval Air Test Center
  - Naval Air Propulsion Center
  - Naval Weapons Center (T&E portion only)
  - Atlantic Fleet Weapons Training Facility
- Army elements
  - Yuma Proving Ground
  - White Sands Missile Range*
  - Kwajalein Missile Range*
  - Electronics Proving Ground
  - Dugway Proving Ground
  - Aberdeen Proving Ground (Material Test Directorate only)
- Air Force elements
  - Space and Missile Test Center* (Western Test Range)
  - Space and Missile Test Center* (Eastern Test Range)
  - Arnold Engineering Development Center*
  - Tactical Fighter Weapons Center (Range Group only)
  - Air Force Flight Test Center (includes Utah Test and Training Range)*
  - Armament Division
  - 4950th Test Wing

*National Ranges

7.3.5.2 Funding. Most MRTFB activities operate under the DOD uniform funding policy, under which the user pays direct costs of services provided, while the T&E activity pays indirect costs. This is intended to insure 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).

Liaison should be established early in the T&E program to establish the resource and schedule requirements 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. In addition to his responsibilities for the Navy elements of the MRTFB, AIR-06 is responsible for the development, acquisition, and management of aerial, surface, and seaborne (less underwater) targets for support of T&E and Fleet training programs. The development, acquisition, and management of underwater targets is controlled by NAVSEA (SEA-63Z4).

7.3.7 RDT&E Support. RDT&E 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 RDT&E support: *dedicated* support precludes employment of the supporting unit in other missions; *concurrent* support permits employment of the supporting unit in activities other than RDT&E 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 RDT&E effort.

7.3.7.1 RDT&E support requirements. RDT&E support requirements are compiled from two inputs:

- Approved TEMPs (see 7.5.3).
- Requests for RDT&E support for research and development not related to specific acquisition programs.

From these two inputs, CNO (OP-098) compiles and publishes, annually, "CNO Long-Range RDT&E Support Requirements" for the budget- and out-years. Fleet commanders use this report

for guidance in planning, programming, and budgeting for RDT&E support.

Using these same two inputs, updated by confirmation procedures, CNO (OP-098) compiles and publishes, quarterly, "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 Priorities for RDT&E support. CNO (OP-098) assigns a priority (applying to Fleet support only) to each RDT&E support task listed in the "CNO Quarterly RDT&E Support Requirements."

- Priority ONE support tasks take precedence over normal Fleet operations.
- Priority TWO support tasks take precedence with normal Fleet operations.
- Priority THREE support tasks take precedence after normal Fleet operations.

7.3.7.3 Scheduling RDT&E support. Fleet commanders-in-chief schedule support tasks listed in the "CNO Quarterly RDT&E Support Requirements" in accordance with assigned priorities. COMOPTEVFOR coordinates RDT&E support scheduling for CNO and reports to CNO, quarterly, the RDT&E support provided.

OPNAVINST 3960.10

7.3.8 RDT&E Platform Resources. These resources include ships and aircraft which are dedicated to acquisition and nonacquisition programs, i.e, Research (6.1) or Exploratory Development (6.2). Ship assets are managed and supported by NAVSEA (SEA-05R2); the aircraft assets, by the NAVAIR Assistant Commander for Test and Evaluation, Aircraft Custodian Branch (AIR-6104).

7.4 TYPES OF T&E

The Navy classifies tests into 2 official categories: Development Test and Evaluation (DT&E) and Operational Test and Evaluation (OT&E). Production Acceptance Test and Evaluation (PAT&E) is a specific type of DT&E. Figure 2-3 shows graphically the relationship between various tests and phases of the acquisition process.

Each OSD category of test has types or subcategories of test that are used by the Navy depending on the equipment or hardware. The following paragraphs describe the general types of tests and give some examples of specific tests that are peculiar to specific types of equipment; i.e., aircraft, ship, etc.

DODDIR 5000.3; OPNAVINST 3960.10

7.4.1 Development Test and Evaluation (DT&E). DT&E is that test and evaluation 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 by, conducted for or by, and monitored by the developing agency (DA). The specific objectives of each phase are developed by the DA and published in the TEMP.

DT&E is conducted in three major phases. Each phase may be divided into subphases (e.g., DT-IIIA, DT-IIIB) if necessary.

7.4.1.1 DT-I. DT-I is DT&E conducted during the demonstration and validation (D&V) phase to support the Milestone II decision which considers entry into full-scale engineering development (FSED). Its principal purpose is to demonstrate: that all technical risk areas have been identified and reduced to acceptable levels; that the best technical approaches have been selected; and that, from this point on, engineering (rather than experimental) effort is required; and the technology needed is in hand.

7.4.1.2 DT-II. DT-II is DT&E conducted during the full-scale development phase to support the production and deployment, i.e., Milestone III, decision. (This decision is the first decision to produce systems for permanent installation in Fleet units or for inventory (see 2.5.4.3). It demonstrates that the design meets its specifications in performance, reliability, maintainability, availability, logistic supportability, compatibility, interoperability, survivability, safety, human factors, and the total spectrum of electromagnetic environmental effects.

7.4.1.2.1 Technical Evaluation (TECHEVAL). The final subphase of DT-II is TECHEVAL. A TECHEVAL is conducted to determine whether the system or equipment is functioning in a technically acceptable manner, whether it meets design and technical performance specifications, and if it is technically and logistically ready for Operational Evaluation (OPEVAL). The Developing Agency (DA) has primary responsibility for planning the test program and obtaining results of test.

Following TECHEVAL, the DA certifies readiness for OPEVAL. However, OPEVAL may not commence until OPNAV and COMOPTEVFOR accept the DA's certification of readiness for OPEVAL in accordance with procedures outlined in OPNAVINST 3960.10.

7.4.1.3 DT-III. DT-III is DT&E conducted after the production and deployment decision to verify that product improvements, or correction of design deficiencies discovered during TECHEVAL, OPEVAL, FOT&E, or Fleet employment, are effective. For aircraft programs, the final phase of DT-III, employing production aircraft, is conducted by INSURV. Aircraft DT-III should be done as early as possible, preferably prior to initial operational capability (IOC).

7.4.1.4 Production Acceptance T&E (PAT&E). PAT&E is defined as that testing conducted on production items to demonstrate that systems meet contract specifications and requirements. Most PAT&E is the responsibility of the DA. However, acceptance trials of new construction or major conversion ships are the responsibility of PRESINSURV. The specific objectives of PAT&E are published in the TEMP.

7.4.2 Operational Test and Evaluation (OT&E). OT&E is conducted to estimate a system's operational effectiveness and operational suitability, identify the need for modifications, and provide information on tactics. OT&E has three distinguishing characteristics: It is conducted in as realistic an operational environment as possible; it is conducted using typical fleet-type personnel for operation and maintenance; and it is conducted 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 production and deployment decision; and follow-on OT&E (FOT&E), which is all OT&E after the production and deployment decision. OT&E is also divided into four major phases (two IOT&E and two FOT&E) and may be further 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 and procuring command, and from the using command, which will be responsible for all OT&E. This organization is the Operational Test and Evaluation Force (OPTEVFOR). OT&E is planned by, conducted by or for, and reported directly to the CNO and SECNAV by COMOPTEVFOR.

The specific objectives of each phase of OT&E are developed by COMOPTEVFOR and published in the TEMP. For Navy-managed programs having USMC application, COMOPTEVFOR coordinates OT&E objectives with the Marine Corps Operational Test and Evaluation Activity (MCOTEA).

OPNAVINST 3960.10; DODDIR 5000.1

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 as to whether the system's potential operational effectiveness justifies continuation of development and to provide operational information on system characteristics.

OT-1 is not required for most programs. It is scheduled only for systems using new operational

concepts or which involve significant operational risks. OPTEVFOR recommendations are a major factor in determining whether OT-1 is required.

7.4.2.2 OT-II. OT-II is that IOT&E conducted during the full-scale development phase to support the production and deployment decision. OPEVAL is the final subphase of OT-II. Specific OT-II objectives include demonstration of the achievement of program objectives for operational effectiveness and operational suitability, and initiation or continuation of 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 conducted after the production and deployment decision, but before production systems are available for testing. 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 be incorporated in production systems, completion of any deferred or incomplete IOT&E, and continuing tactics development.

For ship acquisition programs, OT-III is conducted with the lead ship during the period from delivery to the start of post-shakedown availability (PSA).

7.4.2.4 OT-IV. 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 operational 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 acquisition 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 found to exist and reports to the CNO its recommendations and final settlement of the contract.

OPNAVINSTS 3960.10, 5420.70; INSURVINST 13100.1

7.4.4 Joint Service Programs. Joint Service programs involve two or more Services or agencies.

7.4.4.1 Joint T&E (JT&E). JT&E is conducted to evaluate operational or technical performance of complex systems in realistic conditions. It normally involves "two-sided" testing, with two or more Services participating. It is planned, coordinated, and partially funded by DT&E, with one of the Services providing detailed management.

7.4.4.2 Two-sided testing. Two-sided operational testing involves testing one system against another in as realistic an environment as possible in a test situation. Such tests are structured to 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 Multi-Service 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, OUSDRE. Services pay the participation costs (O&M) for units/personnel involved.

DODDIR 5000.3; OPNAVINST 3960.10

7.5 PLANNING FOR TEST AND EVALUATION

Requirements for test and evaluation are central to the planning of RDT&E effort. TEMPs (see 7.5.3) must be organized around an orderly sequence of project milestone decisions and the associated tests and demonstrations which provide factual information inputs into those decisions. (See discussion of basic T&E policy, paragraph 7.1.3.) 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.

Recognition of the need for adequate statistical planning, design, and evaluation of tests is essential to ensure meaningful results.

The most important single source of information useful in planning for T&E is early and close collaboration with personnel of the prospective testing organization(s). Informal contacts are generally encouraged.

DODINST 5000.2, DODDIR 5000.3; NAVMATINST 3960.6; OPNAVINST 3960.10

7.5.1 Definition of Test Issues and Problems. Planning must provide for the identification and definition of 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 generated is a clear idea of the decisions to be made and other uses to which the information is to be put.

For major systems, the critical issues identified throughout the development period must be addressed in each DCP. The total test plan should be developed so that answers to the critical issues and questions required by decision milestones can be acquired in an efficient and timely manner.

The CNO Development and Program Coordinators, in collaboration with the Project Manager and COMOPTEVFOR, prepare the initial statement of issues and problems. This must be accomplished in time for use in the System Concept Paper (SCP) (see 2.5.5.1).

7.5.2 Coordination with OPTEVFOR. The Developing Activity (DA) is required to establish early and continuing liaison with COMOPTEVFOR to insure that the DT&E program is fully understood and that OT&E requirements are identified and integrated into the program with proper budgeting. The DA is required to provide COMOPTEVFOR with all significant DT&E test data and analyses that will assist in planning or interpreting OT&E. COMOPTEVFOR is required to monitor all pertinent phases of DT&E.

7.5.3 Test and Evaluation Master Plan (TEMP). For each program in ACAT I, II, III, and IV, the TEMP is the controlling management document for T&E. For ACAT III and IV programs, the TEMP is the single document by which the program is controlled.

It is reviewed annually and about three months prior to DSARC or equivalent and is updated to reflect significant results achieved and changes to plans and milestones.

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 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 insure that the data obtained in such areas as reliability and maintainability are statistically useful in the OT&E phase.

The TEMP and revisions thereto are coordinated with appropriate NAVMAT codes, and submitted by the DA through the Program Sponsor (DCNO/DMSO) to OP-098 for approval. Where higher-level approval is required—USDRE for ACAT I, ASN(R,E&S) for ACAT IIS—OP-098

coordinates such approvals after approval by OP-098. A TEMP, approved by OSD or ASN(RE&S), is required with the SCP/DCP or NDCP prior to each milestone decision for ACAT I or IIS programs. DOT&E reviews all TEMPS and is the approval authority for the OT&E section (Part IV) of TEMPs for ACAT I programs.

Approval of the TEMP (or TEMP revision) constitutes CNO direction to conduct the T&E program as defined, including the commitment of RDT&E support. Considerations for preparation of a Navy Training Plan (NTP) should be addressed in the TEMP. The NTP should be approved prior to certification of OPEVAL.

OPNAVINST 1500.8

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 provide 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 the development of certain new facilities required to test a system (MILCON) may be considered part of the institutional share, chargeable to the T&E facility. This should 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 chargeable to project funds.

A major portion of the cost of OPTEVFOR tests is paid by the units involved through Fleet Operation and Maintenance (O&M) funds. However, the project must pay a significant part.

When the time comes to execute tests, funds are transferred to the test activity based on the current estimates of probable costs. If costs run above estimates, more funds must be provided; if they run less, then the surplus is returned to the proj

The DA plans, programs, budgets, and funds the costs of most resources identified in the approved TEMP for all T&E through DT-III and OT-III.

7.5.5 T&E Task Statements. Task statements are a means of communicating to technical and managerial test personnel what it is that is to be tested, specific questions to be answered through the planned tests, and any other data the test is to produce. Testing activities and the SYSCOMs usually have suggested or mandatory task statement formats to fit their own testing procedures and requirements. Specific information on these requirements can be acquired through preliminary liaison with test activity personnel.

7.5.6 Test Resource Planning. The TEMP contains a summary of the resources essential to accomplishment of the test program such as test articles, test activities to be utilized, special facilities and and instrumentation, test platforms, and fleet support services required to accomplish the T&E. Early identification and planning for these requirements is particularly important if new facilities requiring MILCON will be needed or resources such as new instrumentation or targets require development. (See 7.3 for further discussion of T&E resources.)

7.6 FLOW OF T&E-BASED 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 are normally direct participants in tests and thus receive "instant feedback." They have little need for permanently documented information since changes in the evolving design will be made, based on test data, and then evaluated in other experimental tests as soon as possible. For some development tests formal technical reports are required.

7.6.2 T&E Information for Program Managers. Much of the T&E-based information flowing into decisions of the Project Manager will be based on personal contacts, telephone discussions with test personnel, and dispatches reporting the results of tests on a day-to-day basis. Perhaps the single most important route of information flow is direct observation of and participation in important tests

by the Project Manager and his staff. Formal technical reports are usually required (see 7.6.6).

7.6.3 T&E Information for Milestone Decisions. The information input into 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 factors such as the continuing need for the system.

7.6.4 T&E-Based 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 as an OPTEVFOR Tactics Guide. Additional information appears in such publications as tactical manuals and NATOPS (Naval Air Training and Operating Procedures Standardization) manuals for the operation of aircraft. The results of T&E also flow to users through improvements in maintenance and support procedures, associated manuals and other technical information.

7.6.5 T&E Information for the Board of Inspection and Survey. Test activities performing Service Acceptance Tests for INSURV are required to submit test results in the form of 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, are generally prepared and copies filed in the Defense Technical Information Center (DTIC). These reports are then available to all users with a need to know through normal DTIC distribution procedures (see D3, on DTIC).

7.7 TEST AND EVALUATION OF ILS

The basic method used by the Navy to ensure that a system or equipment can be supported in its intended environment is the Integrated Logistic Support Planning (ILSP) System. This planning technique is geared to the development of a system which ensures that the hardware delivered to Fleet units can be supported. The support system addresses operational and maintenance support concepts and requirements and provides for the acquisition of the resources, e.g., personnel, data, spares, test equipment, and facilities needed to satisfy these requirements (see 2.6.1).

The effectiveness of support for a system must be demonstrated in as realistic an operating environment as possible and, where practical, using pilot or early production items. Where this is not possible, preproduction prototypes which are reasonably representative of future production designs will have to be employed.

SECNAVINSTS 3900.36, 5000.39; OPNAVINST 5000.49; NAVMATINSTS 3000.1, 4000.20; DOD 4100.35-G, Integrated Logistic Planning Guide for DOD Systems and Equipment

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7.7.1 Requirements for ILS T&E. ILS planning and products are subject to T&E just as are hardware. Operational availability (Ao) goals are established for all systems and equipments and documented in the TEMP. Objectives and criteria to assess the ability of the support system to support achievement of Ao goals are also established and documented in TEMPs. The ILS Manager (ILSM) helps set 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 both during OPEVAL at the end of development and subsequently in the fleet. Ao is the percentage of time the system should be available for use in its intended operational environment when needed. Ao is established by the OPNAV warfare program sponsor in the earliest acquisition documentation for a system or equipment.

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. CHNAVMAT designs and acquires systems and equipments to meet the established Ao threshold and COMOPTEVFOR is responsible for validating its attainment through appropriate OT&E.

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 using drawing, breadboards, mockups, etc. should be employed to maintain surveillance over progress in achieving stated requirements. As design and fabrication progress, tests and demonstration on actual hardware should be employed to increasing levels. These should culminate in a formal preplanned operational test and evaluation in which the production hardware and the operational and logistic support resources are utilized to validate the efficacy of the integrated logistic support planning process.

7.7.3 Outputs of ILS T&E. The test and evaluation of ILS is to:

- Determine the validity of the preventive maintenance concepts established.
- Validate the accuracy and adequacy of operating and maintenance instructions and other job performance aids provided.
- Validate the need and demonstrate the performance of support and test equipment for conducting operational and maintenance tasks.
- Determine, with specified statistical confidence if possible, system reliability and maintainability against specified values.
- Verify the need and adequacy of facilities (shipboard and shorebased) provided for operation and maintenance of the hardware system.
- Validate the quantitative and qualitative operator and maintenance personnel levels and planned training.
- Assess the credibility of the spares and repair parts allowances established for operational units.
- Evaluate the effectiveness of special handling, transportation, and storage devices proposed for the hardware system.
- Verify, with specified statistical confidence if possible, achievement of quantitative values specified, such as turn-around times, servicing rates, maintenance manhours per operating hour, rearming rate, and restoration times.
- Assess qualitative values such as safety, human factors, environmental protection devices, accessibility, and interchangeability.

7.7.4 Utilization of Results of ILS T&E. Results of the test and evaluation program shall be used to modify, as appropriate:

- Operational and maintenance data.
- Facilities.
- Support and test equipment requirements and allowances.
- Spares and repair part allowances.
- Facility (shipboard and shorebased) requirements and arrangements.
- Unit manning documents.
- ILS planning documents.

7.8 TEST AND EVALUATION FOR SHIP ACQUISITION

Ship acquisition, while subject to the same basic DOD and Navy T&E policies applied to other material procurements, is an area in which special T&E situations exist. The accomplishment of ship T&E varies considerably from the normal test cycle due to the lengthy design, engineering, and construction period for a major ship and because ship T&E includes not only that conducted on the ship platform itself, but also that conducted on the equipments and systems to be installed on the ship. From the RDT&E perspective, the ship T&E process is further prolonged when prototypes must be designed and constructed to test major technological advances in hull design or nonnuclear propulsion.

DODDIR 5000.3; OPNAVINSTS 3960.10, 4700.8; NAVMATINSTS 3960.7, 3960.8; NAVSEA 0900-LP-095-2010, Ship Construction Tests and Trials Manual.

7.8.1 Policies and Principles. Because of the peculiarities described above, the following remarks apply to T&E for ship acquisition:

Because the development/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 ships.

The CNO will determine when a new ship class requires total ship OPEVAL. The CNO will also determine, based on recommendations from CNM, (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 the land-based test site(s), if constructed. For prototype programs (RDT&E-funded), this DT&E and IOT&E also consist of T&E conducted on the lead ship itself.

For all classes of ships, continuing phases of OT&E are accomplished on the lead ship at sea as early in the acquisition process as possible.

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 may also include some earlier equipment PAT&E (such as factory acceptance tests) if imposed as a prerequisite to shipboard installation. For this phase, the CNM 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 the conventional tests and trials conducted on the ship from the time of ship delivery to the Navy up 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 consists of post-delivery OT&E conducted on the lead ship of a ship class acquisition program.

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 is effected through the program's T&E Coordinating Group (TECG).

The Ship Acquisition Project Manager (SHAPM) is the key NMC 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 insure effective planning and conformance to the T&E policies of higher authority, the SHAPM establishes early and continual liaison with OPTEVFOR and INSURV.

The TEMP developed for each ship acquisition program encompasses the T&E for all systems (combat, containment, mobility, and support) and equipments planned for the ship and sometimes for candidate alternative systems/equipments.

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 as described in 7.8.2.
- The PM and/or SHAPM, who, in collaboration with OPTEVFOR, develops the TEMP and is the key NMC 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 Material.

OPNAVINST 3120.28; NAVMATINST 3120.1

SELECTED REFERENCES ON TEST AND EVALUATION

DODDIR 5000.3, "Test and Evaluation."

OPNAVINST 3960.10, "Test and Evaluation."

OPNAVINST 4700.8, "Trials, Acceptance, Commissioning, Fitting Out, and Shakedown and Post Shakedown Availability of U.S. Naval Ships Undergoing Construction/Conversion/Modification."

NAVMATINST 2410.1, "Electromagnetic Compatibility (EMC) within the Naval Material Command (NMC)."

NAVMATINST 3960.6, "Test and Evaluation."

NAVMATINST 3960.7, "Test and Evaluation of Ship Acquisition."

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.

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

APPENDIX A
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 system/equipment. Acquisition in this sense includes the conceptual, validation, full-scale development, production, and deployment/operational phases of the weapon systems/equipment 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 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.

ACTION OFFICER—The lead OSD staff person in the DSARC process who coordinates both OSD issues and DOD component positions. The action officer for each major system acquisition is appointed by the Defense Acquisition Executive.

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

during a specific period under an appropriation, contract authorization, other statutory authorizations, or a combination thereof. An apportionment may relate either to all obligations to be incurred during the specified period within an appropriation account or to obligations to be incurred for an activity, function, project, object, or combination thereof.

APPRAISAL—Impartial analysis of information, at each responsible management and control level, from which the effectiveness and efficiency of the total process can be measured and preventive/corrective action determined.

APPROPRIATION—An annual authorization by an Act of Congress to incur obligations for specified purposes and to make payments out of the Treasury. Appropriations are subdivided into budget activities, sub-heads, programs, projects, etc.

APPROPRIATION, ANNUAL—Also known as one-year appropriations. This appropriation is generally used for current administrative, maintenance, and operational programs, including the procurement of items classified as "expense." These appropriations are available for obligation for one fiscal year and for expenditures for two additional years. This additional two-year period for expenditure may be extended by Congress. At the end of the three-year period of availability, or such other period as approved by Congress, any unexpended balance in an annual appropriation is transferred to the designated successor or "M" account.

APPROPRIATION, MULTIYEAR—An appropriation which is available for incurring obligations for a definite period in excess of one fiscal year; i.e., for two or more years.

APPROPRIATION SPONSOR—DCNO or a Director of a Major Staff Office sharged 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.

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 time-phased 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 DSARC 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) — A DOD Component's latest forecast of operational and technical characteristics, schedule milestones, and program acquisition cost to acquire the total program quantity. (DOD 7000.3)

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 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 explicityly-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 THE NAVY FIVE-YEAR PROGRAM (DNFYP)—The Navy's official programming document, commonly referred to as the Blue Streak. This publication consists of volumes or booklets and displays the Navy's portion of the Five-Year 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—A management concept wherein rigorous cost goals are established during development, and the control of systems costs (acquisition, operating and support) to these goals is achieved by practical tradeoffs between operational capability, performance, cost, and schedule. Cost, as a key design parameter, is addressed on a continuing basis and as an inherent part of the development and production process.

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 CNM-designated project manager assigned responsibility for the development, test and evaluation of a weapon system, subsystem or item of equipment.

DEVELOPMENT ESTIMATE (DE)—The estimate of operational and technical characteristics, schedule milestones, and program acquisition cost (by appropriation) developed at the time full-scale engineering development is initiated or at Milestone II.

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, the Military Departments, the Organization of the Joint Chiefs of Staff, the Unified and Specified Commands, and the Defense Agencies.

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.

EXPLORATORY DEVELOPMENT (Budget Category 6.2)—Includes all effort directed toward the solution of specific military problems, short of major development projects.

FIVE-YEAR DEFENSE PROGRAM—The official 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 LOGISTIC 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; and (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 in accordance with 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 RANGE AND TEST FACILITY BASE (MRTFB)—The complex of major DOD ranges and test facilities.

MAJOR SYSTEM ACQUISITION—A system acquisition program designated by the SECDEF to be of such importance and priority as to require special management attention.

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.

MANAGEMENT INFORMATION PAPER RDT&E (MIP)—Documents, used in support of the proposed program/budget, which describe each project programmed under the RDT&E,N Appropriation.

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—Selfpropelled, boosted, or towed conveyances used for the strategic and tac-

tical deployment of forces, weapons, materials, and supplies in support of naval warfare.

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.

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 capability of the system to perform its intended function effectively over the expected range of operational circumstances, in the expected environment, and in the face of the expected threat, including countermeasures.

OPERATIONAL REQUIREMENT (OR)—The basic requirement document for all Navy acquisition programs requiring research and development effort.

OPERATIONAL SUITABILITY—The capability of the system, when operated and maintained by typical fleet personnel in the expected numbers and of the expected experience level, to be reliable, maintainable, operationally available, logistically supportable when deployed, compatible, and interoperable.

OPERATIONAL SYSTEMS DEVELOPMENT—Includes these projects still in full-scale development but which have received approval for production through DSARC 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)—The estimates of operational and technical characteristics, schedule milestones, and program acquisition cost (by appropriation), developed at the time the Secretary of Defense approved the program or before Milestone I.

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.

PRINCIPAL DEVELOPMENT ACTIVITY (PDA)—The agency assigned by the Chief of Naval Material to undertake the management and technical responsibility for prosecution of the development effort, including timely budgeting for the allocation of resources within the approved plan.

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.

PROGRAM—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—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 Five-Year Defense Program.

PROGRAM ACQUISITION COST (PAC)—The development, procurement, and system specific construction cost to acquire the defense system.

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 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 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—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—The composite of material attributes including performance.

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 an item will perform its intended functions 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 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.

REQUIRED OPERATIONAL CAPABILITY (ROC)—A brief statement of a specific operational capability which is required in the mid-range period.

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.

SHIP ACQUISITION PROJECT MANAGER (SHAPM)—A SHAPM is a NAVSEA Project Manager who manages the development, design, construction, and conversion of assigned ship types. He operates under a charter from Commander, Naval Sea Systems Command as approved by the Chief of Naval Material. A SHAPM's chartered responsibilities normally include Coordinating Authority functions for ship type assigned to him.

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.

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 contributions 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.

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 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.

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 inherent capability of materiel to be moved by towing, by self-propulsion, or by carrier via railways, highways, waterways, pipelines, ocean, and airways.

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 degredation 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.

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 Section C9 of this Guide.

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, with NAVMAT Instruction 3910.16A, the 3910 indicates that the directive is on the subject of R&D planning. The 16 indicates that it was the sixteenth instruction issued by Headquarters Naval Material Command on that subject, while the A indicates that it is the first revision of NAVMAT 3910.16.

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*SECNAVINST 5210.11**

B3 IDENTIFYING AND OBTAINING INSTRUCTIONS

Identifying all directives dealing with a particular subject matter may prove to be somewhat 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 the activity. Such offices are also maintained by

*For additional information on subjects discussed in this Guide, consult the listed references. Titles, current editions, and promulgation dates of directives on which this edition is based can be found in the Master Reference List following the appendixes. When a DOD directive has been promulgated as an enclosure to a Navy directive, the promulgating directive is shown in parentheses following the DOD listing.

the Chiel 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.

B3.1 Navy Consolidated Subject Index. The biggest problem is in identifying the specific directives which provide guidance on a particular subject. Primary aid for identifying directives covering particular subjects is the current edition of NAVPUB Notice 5215, "Consolidated Subject Index," which is issued quarterly. Each edition also includes a numerical list of effective instructions. This document provides a guide to the subject matter of unclassified instructions issued by components of the Navy Department and distributed to addressees outside the originating office. It is usually effective in identifying directives dealing with a subject listed in the "Subject" of the directive.

The greatest difficulty is in 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 for it could also be narrowed considerably by hunting through 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 subject 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 NAVCOMPTINST 7133.1:

> **POLICIES**
>
> **A. General.** The Congressional Committees concerned with the Department of Defense Appropriation Acts and the authorizing Acts related thereto and the Department of Defense have generally 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 the unforeseen requirements, changes in operating conditions, revisions in price estimates, wage rate adjustments, etc., require some diversion of funds from the specific 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 utilization 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 material, it will be remembered, 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 in either 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 covered in the directive. Thus there is no systematic direct relationship between the DOD system and the Navy system.

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.

DODDIR 5025.1

B4.1 DOD Quarterly Listing. The Office of the Secretary of Defense provides a quarterly publication *DOD Directives System: Quarterly Listing of Unclassified Issuance and Subject Index.* Part 1 is a comprehensive subject index. Part 2 is a check list of all DOD directives and instructions in effect. The listing in Part 2 shows all issuances

issued or reissued since the last Quarterly Listing as well as the issue date and number of changes in effect. Distribution of this publication is limited.

DOD Directives System: Quarterly Listing of Unclassified Issuance and Subject Index, issued by OASD (Administration), Correspondence and Directives Division.

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. Classification systems determine the type of information available to the manager and thus shape his perception of the reality he is responsible for managing. The prime function of the manager is the efficient accomplishment of his mission. He is responsible for achieving maximum mission accomplishment from a fixed amount of resources; or, conversely, he is responsible for accomplishing a fixed task with minimum possible resources. To achieve such efficiency, the manager must achieve optimum "balance" within his program. Optimum balance means that all resources available to him must be put to their most productive use. In other words, he must make "tradeoffs," or move resources within his program to put them to their most productive use. Classification systems provide both the key to detection of imbalance within the program and opportunities to increase effectiveness through tradeoffs. (See paragraph 4.4.1, Concept of the "balanced program.")

A classification system is generally designed to meet a specific need of a particular user. No single rigid classification system can be designed to meet the needs of all users. An understanding of classification systems can aid a program manager in selecting the system(s) that will meet his 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 that will permit a decision maker to make a decision with confidence that he has all the relevant information and that it 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 that do not convey 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 derive a different perspective on the subject matter.
- It should lend itself to 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 amenable to computerization.

C2 QUALITIES OF BASELINE COST ESTIMATES

All judgments of costs 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 based on the following definitions:

- Planning Estimate (PE) — The estimate of operational/technical characteristics, schedule, and Program Acquisition Cost (by appropriation) developed at the time the Secretary of Defense approves program initiation.

- Development Estimate (DE) — The estimate of operational/technical characteristics, schedule and Program Acquisition Cost (by appropriation) developed at the time Full-Scale Development is initiated (Milestone II).

- Current Estimate (CE) — The DON's current estimate of operational/technical characteristics, schedule, and Program Acquisition Cost to acquire the inventory objective quantity, including usage or losses, necessary to reach the inventory objective.

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*DODINST 7000.3 (SECNAV 7700.5)**

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*For additional information on subjects discussed in this Guide, consult the listed references. Titles, current editions, and promulgation dates of directives on which this edition is based can be found in the Master Reference List following the appendixes. When a DOD directive has been promulgated as an enclosure to a Navy directive, the promulgating directive is shown in parentheses following the DOD listing.

C2.2 Measures of Confidence for Cost Estimates. 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 proposals in response to a RFP.

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 usually by a computer model and based on cost estimating relationships and gross parameters.

Class F — Ball Park Estimate. Quick cost estimates prepared in absence of minimum design and cost information and based on gross parameters.

Class X — Directed or Modified Cost Estimate. Estimate not developed by SYSCOMS through normal cost estimating processes.

OPNAVINST 7000.17; DON Programming Manual, Appendix J

C3 NAVAL RESEARCH PROGRAM STRUCTURE

The structure for the Naval Research Program is promulgated 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 of the Research Program is depicted graphically in Figure C-1.

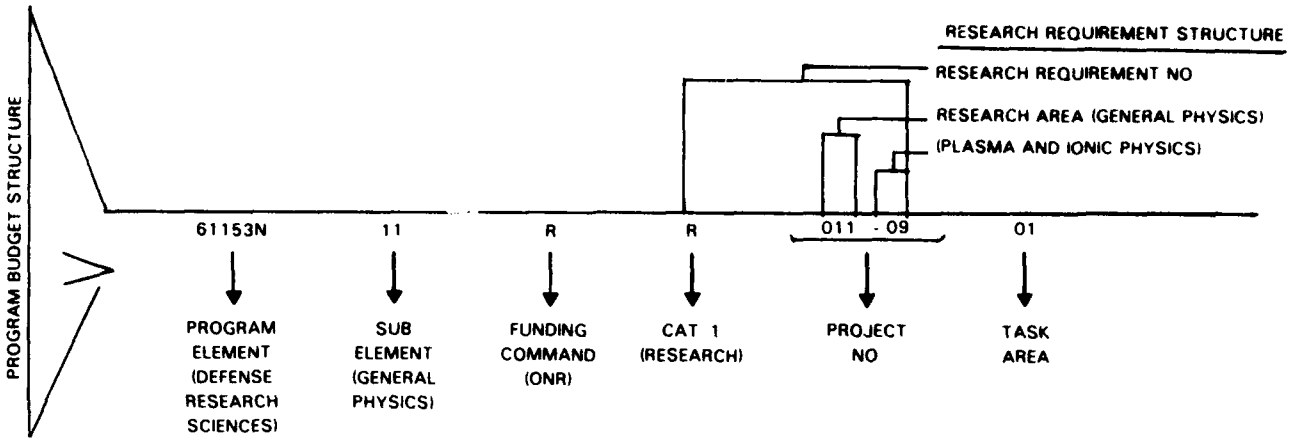

Figure C-1 Research Program/Budget Structure

C3.1 Program Building Blocks.

C3.1.1 Program elements. The Naval Research Program Structure consists of two program elements:

61152N - In-House Laboratory Independent Research
61153N - Defense Research Sciences

C3.1.2 Subelements of the Research Program. The program is structured around subelements as follows:

11 — General Physics
12 — Radiation Sciences
13 — Chemistry
14 — Mathematics
21 — Electronics
22 — Materials
23 — Mechanics
24 — Energy Conversion
31 — Oceanography
32 — Terrestrial Sciences
33 — Atmospheric Sciences
34 — Astronomy and Astrophysics
41 — Biological and Medical Sciences
42 — Behavioral and Organizational Sciences
51 — University Research Instrumentation
00 — Navy In-House Laboratory Independent Research Area.

C3.1.3 Research sponsor/claimant codes. All elements of the Research Program are identified with the sponsoring organizations by the following letter codes:

M - Naval Medical Research and Development Command (NAVMEDRSCHDEVCOM)
R - Office of Naval Research (ONR)
W - Naval Air Systems Command (NAVAIRSYSCOM)
X - Naval Electronic Systems Command (NAVELEXSYSCOM)
Y - Naval Facilities Engineering Command (NAVFACENGCOM)
S - Naval Sea Systems Command (NAVSEASYSCOM)
T - Naval Supply Systems Command (NAVSUPSYSCOM)
Z - DCNM(T)

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 15 Defense Research Sciences' subelements or the In-House Laboratory Independent Research Element). The fourth and fifth digits indicate the specific Research Requirement within the related Naval Research Area. For example:

R031 - Oceanography 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 Program Planning Structure is promulgated by the Chief of Naval Development for use in planning and programming exploratory development throughout the Department of the Navy.

NAVMATINST 3910.20

C4.1 Program Building Blocks.

C4.1.1 Program element. Program elements are the smallest subdivisions of the R&D program considered in the DOD programming system. In exploratory development, a program element consists of a number of projects in a technology field and within a single budget activity. See C4.3 below for a listing of program elements within the Exploratory Development Program.

C4.1.2 Program group. Program groups are primary divisions within the Navy exploratory development planning system. They are used for management and data processing purposes, providing the links between the Navy planning system and the program elements of the DOD system. They correspond one-to-one with the program elements (see C4.3 below).

C4.1.3 Functional area. Functional areas are the seven principal technology headings under which exploratory development efforts are classified for program planning purposes. The functional areas are:

100 — Target Surveillance
200 — Command, Control, and Communications (C^3)
300 — Weaponry
400 — Naval Vehicles
500 — Support Technology
600 — Special Technology Demonstrations
700 — Small Business Programs.

C4.1.4 Functional subarea. Functional subareas are subdivisions of the functional areas. These subareas serve to classify more precisely groups of related project areas.

C4.1.5 Project area. Project areas further subdivide the subareas and serve to define and group closely related technology areas. A portion of the structure described in C4.1.3, C4.1.4, and this paragraph appears as follows:

100—Target Surveillance
150—Multipurpose Surveillance Technology
151—Multipurpose Radio Frequency Surveillance
152—Multipurpose Optical/IR/UV Surveillance.

The functional areas, functional subareas, and project areas are described in detail in NAVMATINST 3910.20.

C4.1.6 Project. Projects encompass the aggregate of work efforts under a given project area (or subarea in special cases) which fall within a single program group (and therefore a single program element, see C4.1.2).

C4.1.7 Subproject. Subprojects encompass the aggregate of work efforts within a project which are assigned to a single claimant. Claimant codes are identified by the Research Sponsor/Claimant Codes listed in C3.1.3 above.

Titles of subprojects are assigned by the claimants and are descriptive of the work.

C4.1.8 Task/Work Unit. Tasks and work units are smaller segments into which exploratory development effort may be divided for purposes of local administration. Tasks encompass exploratory development effort directed toward a specific objective. They consist of one or more work units and may be assigned to one or more individiual laboratories for implementation. Work units, which may be subdivisions of a task are assigned by the organization performing the work for local technical control and supervision.

C4.2 Numbering System. Based upon the building blocks described above, the numbering system applied to specific development efforts within the Exploratory Development Program is designed to permit ready identification and retrieval of information regarding any portion of the program. An example of the use of the system is graphically depicted in Figure C-2.

An Exploratory Development effort	F
in the "Missile Propulsion" Program Group	31 (PE 62331N)
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

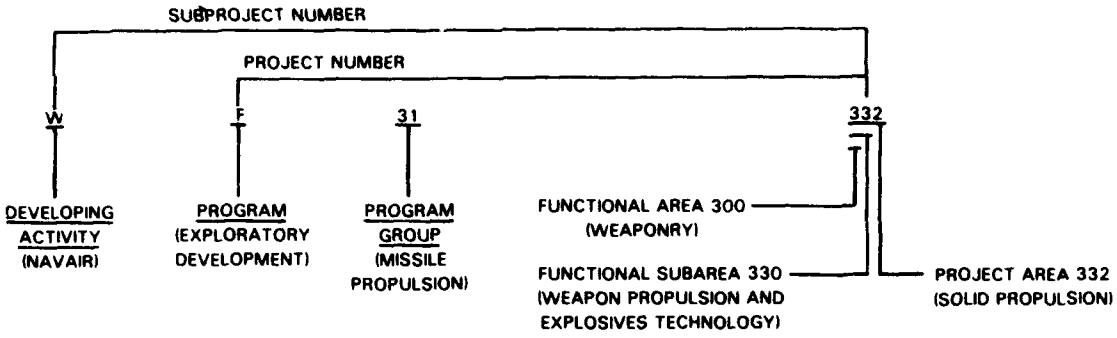

Figure C-2. Exploratory Development Program/Budget Structure

C4.3 Exploratory Development Program Groups and Program Elements. Program elements are indicated by the five-digit number, the program groups by two-digit numbers in the listing below.

62101N	01	Tactical Directed Energy Technology
62711N	11	Undersea Target Surveillance Technology
62712N	12	Surface/Aerospace Target Surveillance Technology
62721N	21	Command and Control Technology
62331N	31	Missile Propulsion Technology
62332N	32	Surface/Aerospace Weaponry Technology
62633N	33	Undersea Warfare Weaponry Technology
62734N	34	Countermeasures Technology
62241N	41	Aircraft Technology
62542N	42	Nuclear Propulsion Technology
62543N	43	Ship and Submarine Technology
62757N	57	Human Factors and Simulation Technology
62758N	58	Biomedical Technology
62759N	59	Ocean and Atmospheric Support Technology
62760N	60	Logistics Technology
62761N	61	Materials Technology
62762N	62	Electronic Device Technology
62763N	63	Personnel and Training Technology
62764N	64	Chemical/Biological/Radiological Defense Technology
62766N	66	Laboratory Independent Exploratory Development

C5 MISSION NEED CLASSIFICATION STRUCTURES

Mission need classification structures (see discussion of "needs and requirements" in 2.2.9.1) provide guidance for conceptualizing potential systems and development of the technology base. There is a number of such structures, developed more or less independently by organizations for their own purposes. Various efforts have been and are being made 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 Navy RDT&E Planning Categories. Science and Technology Objectives (STOs) are set

forth in the following categories, promulgated by CNO (Director RDT&E):

Strategic Deterrence
- Sea-Based Strategic Warfare (SB)

Sea Control
- Anti-Air Warfare (AA)
- Anti-Submarine Warfare (AS)
- Anti-Ship Warfare (SH)
- Mine Warfare/Mine Countermeasures (MW)

Projection of Power Ashore
- Amphibious Warfare (AW)
- Tactical Warfare Ashore (TW)
- Special Warfare (SW)

Mission Support
- Personnel/Medical (PN)
- Support, Logistics & Underway Replenishment (SL)
- Ocean Surveillance (OS)
- Command, Control, and Communications (CC)

OPNAVINST 5000.42

C5.2 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 C^3I
- 213.4 Support

STO 214 Land Mine WF
- 214.1 Mines
- 214.2 Barriers
- 214.3 Countermeasures

STO 215 Combat Support
- 215.1 Engineer
- 215.2 NBC
- 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 C^3I
- 254 Tactical Command and Control (C^2)
- 255 Tactical Surveillance, Reconnaissance, and Target Acquisition
- 256 Tactical Communications
- 257 Electronic Warfare and Counter C^3I

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

C5.3 Naval Combat Readiness Criteria. For purposes of assessing and reporting the combat

readiness of Fleet units, OPNAV has established a three-level structure of combat readiness criteria which some RDT&E planners hold to be well suited as a framework for structuring RDT&E needs. The combat readiness needs structure has 15 mission areas at the top level which are broken out into "Operational Capabilities" at the next level; most of these are further broken out 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." (Unclas)

OPNAVINST 3501.2 (Confidential)

C6 CLASSIFICATIONS USED FOR APPROPRIATIONS

The appropriations classification structure is prescribed for use in development of the budget and its presentation to the Congress.

C6.1 DOD Budget Structure. The following functional titles and subdivisions thereof are prescribed for use in appropriate budgetary and fiscal presentations:

Military Personnel
- Active Forces
- Reserve Forces

Retired Military Personnel

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

Family Housing

Other — Special Foreign Currency Program

Revolving and Management Funds.

DON Budget Guidance Manual (NAVCOMPT 7102.2)

C6.2 RDT&E Budget Activities. The RDT&E appropriation request is organized around budget activities which are mission-oriented in accordance with the Congressional Budget and Impoundment Control Act of 1974 (see 4.4.5). Definitions are given below.

1 Technology base. This activity provides for the development of promising technological advances to support development of future Navy systems. Research and development activities in this area are initial efforts to determine feasibility of principles and concepts and involve the physical, mathematical, environmental, engineering, biomedical, and behavioral sciences.

2 Advanced technology development. This activity supports exploration of promising systems alternatives and concepts. Among the efforts funded in recent years have been programs in aeronautics and propulsion, flight simulation, biomedical sciences, weapons technology, high-energy lasers, and electronics.

3 Strategic programs. This activity ensures that future strategic systems will continue to deter nuclear attacks, as well as coercion through the threat of nuclear attacks against the United States and its allies. The submarine and missile components of the TRIDENT sea-launched ballistic missile system continue in development.

4 Tactical programs. This activity provides new combat systems for general-purpose forces of the United States and its allies.

5 Intelligence and communications. This activity provides improvements to Navy capabilities in intelligence and worldwide communications.

6 Defensewide mission support. This activity provides funding for support-type efforts including Federal contract research centers, ranges and test facilities, and studies and analyses.

C7 CLASSIFICATIONS USED IN THE DOD PROGRAMMING SYSTEM

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
9 Administration and Associated Activities
0 Support of Other Nations.

DON Programming Manual

C7.2 Program Element

A program element is the basic building block of the Five-Year Defense Program (FYDP). It is a description of the mission to be undertaken and a *collection* of the organizational entities identified to perform the mission assignment Elements may consist of forces, manpower, materials (both real and personal property), services, and associated costs. The full list of Department of the Navy program elements is detailed in the *DON Programming Manual.*

Program elements are identified by a six-character symbol as set forth graphically in Figure C-3.

C8 STANDARD COST DEFINITIONS

The unit procurement costs of weapon systems can vary substantially, depending on what is included in the cost figures. To clear up confusion, the following standard cost definitions have been established:

- Flyaway Cost
  - Basic Unit (airframe, hull, chassis, etc.)
  - 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)
  - 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)
  - Procurement Cost (see above) plus:
  - RDT&E
  - MILCON.

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, reports, forms, and other documents by subject.

SECNAVINST 5210.11

C9.1 Major Subject Groups.

1000 Series — Military Personnel. Includes subjects relating solely to the administration of military personnel. (Civilian personnel subjects are included in the 12000 series. General personnel subjects relating to both civilian and military personnel are included in the 5000 series.)

2000 Series — Communications. This series includes subjects relating to general communica-

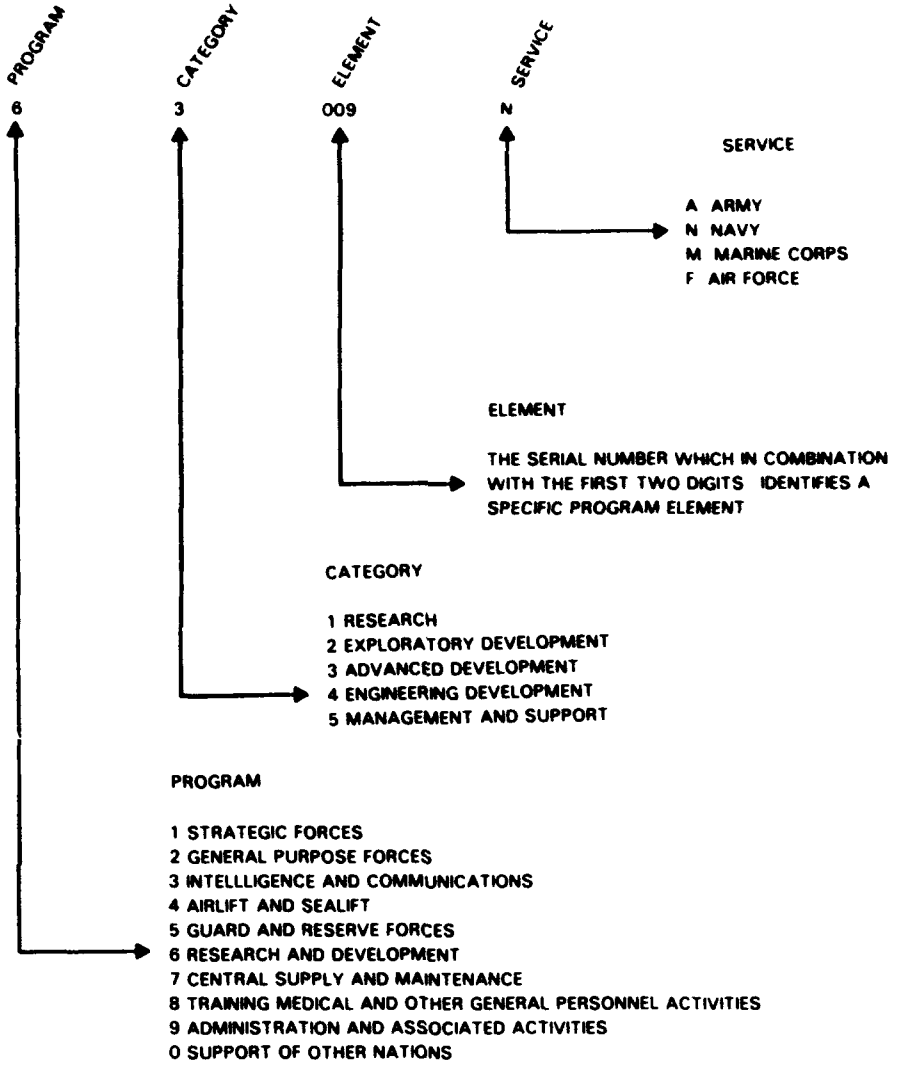

Figure C-3. Example of Program Element Numbering

tion matters and to communication systems and equipment.

3000 Series — Operations and Readiness. Includes subjects relating to such matters as operational plans, fleet operations, operational training and readiness, warfare techniques, operational intelligence, and research and development.

4000 Series — Logistics. Includes subjects relating to the 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. Includes subjects relating to the administration, organization, and management of the Department of the Navy, including general personnel matters (concerning both civilian and military personnel), security, external relations, law and legal matters, office services, and publication and printing matters.

6000 Series — Medicine and Dentistry. Includes subjects relating to medical matters, such as physical fitness, general medicine, special or preventive medicine, dentistry, and medical equipment and supplies.

7000 Series — Financial Management. Includes subjects relating to the financial administration of

the Department of the Navy, including budgeting, disbursing, accounting, auditing, industrial and other special financing matters, and statistical reporting.

8000 Series — Ordnance Material. Includes subjects relating to all types of ordnance material and weapons, including ammunition and explosives, guided missiles of all types, underwater ordnance materials, and miscellaneous ordnance equipment.

9000 Series — Ships Design and Material. Includes subjects relating to such matters as the design, characteristics, and readiness of ships, and to ships material and equipment.

11000 Series — Facilities and Activities Ashore. Includes subjects relating to ashore structures and facilities, transportation facilities, utilities and services, and other similar subjects.

12000 Series — Civilian Personnel. Includes subjects relating solely to the administration of civilian personnel. (Military personnel subjects are included in the 1000 series. General personnel subjects relating to both civilian and military personnel are included in the 5000 series.)

13000 Series — Aeronautical and Astronautical Material. Includes subjects relating to 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. Includes subjects relating solely to administration and mission of the Coast Guard.

C9.2 Primary, Secondary, and Tertiary Numerical Subject Groups. The thirteen major numerical subject groups are subdivided into primary, secondary, and sometimes tertiary breakdowns. Primary subjects are designated by the last three digits (the hundred group) 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 and Techniques
5300 Manpower/Personnel
5400 Organization, Functions, and Status
Etc.

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/Paperwork Management; Office Methods
5211 Files and Records Systems.

Some of the smaller subject groups are not subdivided 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 major subject.

C9.3 RDT&E Subject Groups. The primary subject group, Research and Development, under major subject area, Operations and Readiness, is subdivided into four secondary groups as follows:

3000 Operations and Readiness
3900 Research and Development
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) of the Federal Council on Science and Technology (now defunct). This is a listing of major scientific and technical subject areas, 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 such 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 for the reporting of R&D effort at the task area and project levels (DD Form 1634) and, in conjunction

with the Defense Technical Information Center (DTIC), for reporting and retrieval of information at the work unit level on all scientific and technical work (DD 1498) and of information on Independent Research and Development. The major subject headings of the COSATI list as modified by DTIC are given below, with an example 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.

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 (Non-propulsive)
- Materials
- Mathematical Sciences
- Mechanical, Industrial, Civil, and Marine Engineering
- Methods and Equipment
- Military Sciences
- Missile Technology
- Navigation, Communications, Detection, 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 defense material item (meaning usually a major system or equipment). 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 shown below:

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

Etc.

MIL-STD-881

C11.1 Ship Work Breakdown Structure (SWBS). NAVSEA has developed a further, extremely detailed structure based upon that contained in 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 is still in use in historical data. It is intended to provide a single language which can be used through the entire ship life cycle. Its use is illustrated below:

WBS Level 2	SWBS Major Groups (WBS Level 3)
Ship	000 General Guidance and Administration
	100 Hull Structure
	101 General Arrangement-Structural Drawings (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
	Etc.

NAVSHIPS 0900-039-9010

APPENDIX D TECHNICAL INFORMATION SERVICES

TABLE OF CONTENTS

APPENDIX D
TECHNICAL INFORMATION SERVICES

Programs, facilities, services, and organizations are available to meet the information needs of Navy RDT&E personnel (and, to a lesser extent, their active and potential contractors). The more important ones are described in this appendix.

All organizational elements of the Navy performing, contracting for, or authorizing scientific and technical work and studies and analyses are required by SECDEF and SECNAV to query the DOD RDT&E data bases maintained at the Defense Technical Information Center (DTIC) (see D3.1) prior to commencing new research or development work.

*DODREG 3200.12-R-1**

D1 SCIENTIFIC AND TECHNICAL INFORMATION PROGRAM

The Department of Defense operates a comprehensive, coordinated Scientific and Technical Information Program (STIP) to ensure that scientific and technical information (STI) provides maximum contribution to the advancement of science and technology; permits timely, effective, and efficient conduct and management of DOD research, engineering, and studies programs; and eliminates unnecessary duplication of effort and resources encouraging and expediting the interchange and use of STI. The STIP provides for interchange of STI within and among DOD components and their contractors, federal agencies and their contractors, and the national and international scientific and technical community.

*For additional information on subjects discussed in this Guide, consult the listed references. Titles, current editions, and promulgation dates of directives on which this edition is based can be found in the Master Reference List following the appendixes. When a DOD directive has been promulgated as an enclosure to a Navy directive, the promulgating directive is shown in parentheses following the DOD listing.

DODDIR 3200.12 (SECNAV 3900.43); SECNAVINST 3900.43

D2 NAVY TECHNICAL LIBRARIES

The Navy (and DOD) technical libraries are vital to effective RDT&E information transfer. They are the activities' access point to most of the technical information services described in this appendix and provide direct access to technical reports, books, periodicals, and other established library facilities and services tailored to users' needs.

In most instances, the Navy terminals for the Defense RDT&E On-Line System (DROLS) maintained by DTIC (see D3.2.1) are located in the technical libraries so that trained library staff can assist RDT&E personnel. If a technical library does not have on-line terminals to DTIC, the librarian can assist in formulating DOD RDT&E data base queries which are then sent to DTIC for processing and the search results returned by mail.

As a general rule, information-gathering efforts involving services described in this appendix should begin with discussions with the activity's librarian.

D3 DEFENSE TECHNICAL INFORMATION CENTER (DTIC)

DTIC is designated to provide a source of STIP services to assist in carrying out STIP policy and administration, operate DOD-wide systems, and serve as a central coordinating point for DOD STI data bases.

DODDIR 3200.12 (SECNAVINST 3900.43)

D3.1 DOD RDT&E Data Bases. Three DOD RDT&E data bases are operated by DTIC. The

data bases contain information summaries on on-going work, on industry Independent Research and Development (IR&D), and technical reports.

D3.1.1 Work unit data base (DD 1498). This data base provides answers concerning the who, what, when, where, how, costs, and status of on-going Defense-sponsored research and technology performed at DOD facilities or by contracts/grants. Included are the name and phone number of the scientist or engineer performing the work. DOD components provide this information to DTIC on Research and Technology Work Unit Summaries (DD Form 1498). Historical information can also be obtained from this data base.

DODREG 3200.12-R-1

D3.1.2 IR&D data base (DTIC 271). This data base contains proprietary information on Defense-related in-house work from companies in the DOD-Industry Independent Research and Development (IR&D) program. Because the information is proprietary, its use is limited to DOD personnel. DOD contractors provide reports yearly on their IR&D programs and these reports are referenced on DTIC Form 271, which provides information similar to that provided by the DD Form 1498's.

DODINST 3204.1; SECNAVINST 3900.40; NAVMATINST 3900.11

D3.1.3 Technical reports data base (DD 1473). This data base contains bibliographic citations with abstracts and other information on DOD-sponsored scientific and technical reports submitted to DTIC. DOD components and contractors submit the information for the data base on the DD Form 1473.

In addition DTIC acquires, stores, announces, retrieves, and provides secondary distribution of scientific and technical documents directly to registered users.

MIL-STD-847 (SECNAV 3900.29)

D3.2 DTIC Products and Services

D3.2.1 Defense RDT&E On-Line System (DROLS). Remote computer terminals provide on-line access to the DOD RDT&E data bases listed in D3.1. As of the date of this edition more than 130 dedicated and 550 dial-up on-line terminals for the DROLS are available. Specific Navy locations of these terminals can be obtained from your activity's technical library or from DTIC.

Nonfederal DTIC-registered organizations in the Washington, D.C. area, the Los Angeles and Pasadena, California areas, and the Boston, Massachusetts area may make searches of the DROLS through terminals available for this special access.

These remote terminals are located at: DTIC, Cameron Station, Alexandria, Virginia; Defense Contract Administration Services Region, 11099 South La Cienega Boulevard, Los Angeles, California; Building 1103, Hanscom Air Force Base, Bedford, Massachusetts; and Navy Acquisition, Research and Development Information Center offices in Pasadena, California and Alexandria, Virginia (see D5 for complete addresses).

D3.2.2 Technical Abstract Bulletin (TAB). This bulletin is a bi-weekly listing of all new classified and unclassified/limited access scientific and technical reports received by DTIC within the processing period. (Unclassified/unlimited scientific and technical reports are listed by the National Technical Information Service (NTIS) (See D9).) It is divided into two sections — bibliographic records and indexes. The listings are grouped by subject fields and reports are assigned an AD number for requesting and retrieval purposes. The index lists *all* new documents — including those announced only by NTIS. The bulletin is classified CONFIDENTIAL. Automatic distribution is made to DTIC-registered users who have requested it.

D3.2.3 TAB Annual Indexes. Classified CONFIDENTIAL. Available only in microfiche.

D3.2.4 Special technical report service. DTIC offers an Automatic Document Distribution (ADD) service which provides microfiche copies of newly accessioned documents which match a user's subject-interest profile.

Upon request, DTIC will make a computer search of the collection to locate technical reports pertinent to the user's research problem or project. The requesting organization specifies the time coverage of search.

D3.2.5 Technical report copy service. Registered users may request copies of technical reports in either full-size hard copy or microform.

D3.2.6 Bibliographies. These are listings of technical reports related to specific subjects. A computerized search is made of the DTIC collection to list applicable reports with control numbers, informative abstracts, and descriptive data of research projects.

The three main types of bibliographies offered by DTIC are Report, Current Awareness, and Direct Response. They differ in depth of search, response time, and product format.

Report (Demand) Bibliography — A tailor-made literature search on a particular subject, conducted at the request of a user.

Current Awareness Bibliography (CAB) — Provides a customized, automated bibliography service based on the recurring subject needs of DTIC users. Every two weeks the users subject interest profile is matched against information contained in newly accessioned documents.

Direct Response Bibliography — A tailored response to a specific request received in writing or through the Telex Telecommunications System at Headquarters, DLA.

D3.2.7 Referral service. DTIC's referral service provides information concerning DOD-sponsored specialized sources of scientific and technical knowledge. When users require information exceeding that contained in DTIC, this service directs them to these potential sources of expertise, or to the National Referral Center (see D10).

In addition, DTIC periodically issues a *Referral Data Bank Directory* which lists specialized scientific and technical information sources. All the listed information sources are operated or supported by the DOD or other Federal agencies. Types of organizations included are information analysis centers, data centers, information offices, libraries, laboratories, testing directorates, information exchanges, etc.

The directory gives detailed descriptive information on the subject areas, services and materials available, publications issued, and access limitations of each activity listed.

D3.3 Obtaining DTIC Services. Research and development activities within the United States Government and their associated contractors, subcontractors, and grantees, with current government contracts, are eligible to receive most of the information from DOD data bases located at DTIC. In addition, research and development organizations without current contracts may become eligible for service by a military service authorization under the Defense Potential Contractors Program.

There are collections, however, which contain proprietary data or information compiled for the specific purpose of DOD management decisions which are made available to Defense components only.

All Navy (and DOD) activities are already 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) entitled, "Certification and Registration for Access to DOD Scientific and Technical Information," This regulation outlines the necessary procedures and includes the DOD forms required for registration. Requests for the regulation or for additional information concerning DTIC should be addressed to:

Defense Technical Information Center
Attn: DTIC-DDR-2
Building No. 5, Cameron Station
Alexandria, VA 22314
Telephone: Comm. (703) 274-6871,72
Auto. X-284-6871,72

DLAR 4185.10 (promulgated in the DON as NAVMATINST 3900.15)

D4 INFORMATION ANALYSIS CENTERS (IAC's)

The Defense Department supports 19 centers for analysis of scientific and technical information. Eight contractor-operated IAC's are now administratively managed and funded by the Defense Logistics Agency (DLA) and DTIC. Eleven others are managed by other DOD activities. (The establishment of a contractor-operated Manufacturing Technology Information Analysis Center (MTIAC) to be administered by DTIC is anticipated.) These Centers receive technical management from DOD laboratories and agencies with leading competence in the field of science and technology within which the particular Center functions. In addition, technical expertise is provided by practicing scientists and engineers associated with the research and development facility.

Each center gathers information in its specialized area of interest, reviews, analyzes, evaluates, synthesizes, condenses, and summarizes the information, and provides it to individual users. These centers also provide critical reviews, state-of-the-art monographs, data compilations, substantive answers to questions, and access to technical advice by subject authorities.

Most DOD IAC's are on a service charge basis for both in-house and contract users. Information on the particular IAC most likely to provide information for the user's problem may be obtained from DTIC. Contract data and detailed information sources are included in the *DTIC Referral Data Base Directory* and the *Directory of Federally Supported Information Analysis Centers.* Both publications may be purchased from the Government Printing Office.

D4.1 Shock and Vibration Information Center (SVIC). The Shock and Vibration Information Center (SVIC) is the only Navy-managed IAC. SVIC's mission is threefold: it collects, evaluates, and disseminates information on current and past studies of mechanical shock and vibration technology.

SVIC sponsors *The Shock and Vibration Symposia* and publishes the unclassified proceedings in *The Shock and Vibration Bulletin* (with a classified supplement, when required). *The Shock and Vibration Digest* is a monthly unclassified SVIC publication containing abstracts of articles taken from over 125 worldwide journals and from unclassified documents and reports. The Digest also includes feature articles, news briefs, reviews of meetings, short course offerings, a calendar of technical meetings, and reviews of books and technical documents. SVIC covers the current state-of-the-art in shock and vibration by publication of monographs written by experts in the field. A significant SVIC function is its Direct Information Service, i.e., answering the questions of its subscribers by pertinent reference, detailed literature searches, and referral to senior investigators and engineers who have direct knowledge of the requested information.

For SVIC services, contact:

Shock and Vibration Information Center
Naval Research Laboratory
Code 5804
Washington, D.C. 20375-5000
Telephone: Comm. (202) 767-3306
Auto. X-297-3306

D4.2 Other IAC's. Information on IAC's may be obtained from the Program Manager for IAC's, DTIC. Data from certain IAC's, marked by *, can be obtained through the DTIC DROLS (see paragraph D3.2.1).

Coastal Engineers Information Analysis Center

*Chemical Propulsion Information Agency

Cold Regions Science and Technology Information Analysis Center

Concrete Technology Information Analysis Center

Data Analysis Center for Software

DOD Nuclear Information Analysis Center

*Tactical Weapons Guidance and Control Information Anaylsis Center

Hydraulic Engineering Information Analysis Center

Infrared 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

Tactical Technology Center

Thermophysical and Electronic Properties Information Analysis Center

D4.3 Test Technology Information Center (TTIC). Although not officially an IAC the TTIC provides a similar service. The TTIC maintains and disseminates information regarding research documentation 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 and particularly test technology. TTIC is located at:

Fleet Analysis Center
Naval Weapons Station, Seal Beach
Corona Annex
Corona, CA 91720
Telephone: Comm. (714) 736-5000
Auto. X-933-0111

D5 NAVY ACQUISITION, RESEARCH AND DEVELOPMENT INFORMATION CENTER (NARDIC)

The Navy Acquisition, Research and Development Information Center (NARDIC) is the focal point within the DON for making information regarding research and development planning and requirements available to industry representatives who are registered for DOD information services.

NARDIC has three offices for the convenience of industry: in Alexandria, Virginia; in Pasadena, California; and at Wright-Patterson AFB, Ohio. At Alexandria, NARDIC is colocated with counterpart Army and Air Force offices, creating a Tri-Service Industry Information Center. At Pasadena and Wright-Patterson AFB NARDICs are colocated with counterpart Air Force offices.

In the Washington, D.C. area the NARDIC representative is located in the Headquarters U.S. Army Materiel Command (AMC). The mailing address is:

Navy Acquisition, Research and Development Information Center

5001 Eisenhower Avenue
Alexandria, Virginia 22333-0001
Telephone: Comm. (202) 274-9315
Auto. X-284-9315

On the West Coast, the NARDIC representative is located in the Office of Naval Research detachment. The mailing address is:

Navy Acquisition, Research and Development Information Center

Naval Ocean Systems Center
1030 E. Green Street
Pasadena, California 91106
Telephone: Comm. (818) 792-5182
Auto. X-360-2452/6

At Wright-Patterson AFB, the NARDIC representative is located in Area B, Bldg. 22, Room S122 in the Air Force Wright Aeronautical Laboratory. The mailing address is:

Navy Acquisition, Research and Development Information Center

Air Force Wright Aeronautical Laboratory
(AFWAL GLIST)
Wright-Patterson AFB, Ohio 45433
Telephone: Comm. (513) 258-4261
Auto. X-785-5572

Each NARDIC office provides a reading room where representatives of qualified organizations may review those documents relevant to the

R&D capability of the organization. On-line access to DTIC holdings is available at Pasadena and Wright-Patterson.

The services of NARDIC are available to representatives of industrial, scientific, or other organizations registered for access to DOD (DTIC) information services. An organization may register for DOD information services as a contractor or potential contractor.

OPNAVINST 3910.19

D6 NAVY/INDUSTRY COOPERATIVE RESEARCH AND DEVELOPMENT PROGRAM (NICRAD)

The Department of the Navy/Industry Cooperative Research and Development (NICRAD) Program was established to inform the scientific and technical community of the problems confronting the DOD and the Navy. The NICRAD program provides a mechanism for interchange of technical information with civilian scientists and engineers and for facilitating technology transfer on a cooperative, no-cost, controlled basis.

Through the NICRAD program both classified and unclassified technical information on Navy requirements and existing R&D is provided to nongovernment activities. NARDIC and DTIC services are available to NICRAD participants. Participation is accomplished through the execution of a policy agreement with a NICRAD focal point. Firms, individuals, or activities with substantiated R&D capability and a reasonable potential for eventually receiving and executing a contract with the Navy and/or those desiring to participate in the unclassified technology transfer program are eligible. Additional information can be obtained from the NARDIC offices (see D5).

OPNAVINST 5500.33; NAVMATINST 3900.14

D7 ADVANCED PLANNING BRIEFINGS FOR INDUSTRY (APBI)

Advanced Planning Briefings for Industry (APBI's) provide U.S. industry with information to help plan research and development programs responsive to future Navy needs. APBI's consist of formal, classified presentations of DON research and development plans, programs, and challenges relating to future military requirements. Attendance at APBI's is limited to U.S. industry participants in the Independent Research and Development (IR&D) Program, Navy/Industry Cooperative Research and Development (NICRAD) Program, Army Qualitative Requirement Information (QRI) Program, Air Force Potential Contract Program (PCP), and other appropriate Navy contractors on case-by-case basis.

Proceedings of APBI's are available for review by qualified users through the NARDIC offices (see D5).

NAVMATINST 3900.4

D8 GOVERNMENT-INDUSTRY DATA EXCHANGE PROGRAM (GIDEP)

The Government-Industry Data Exchange Program is a cooperative activity between Federal Government and industry participants and is sponsored by the Joint Logistics Commanders. The program provides participants with automatic interchange of technical data related to parts, components and materials utilized in military and space systems.

Participation in the program does not require participants to generate any data not required by some other portion of a contract. GIDEP is simply a mechanism to ensure that unclassified and unlimited rights technical data required to be delivered under a contract is shared with the technical community to enable cost savings on a reciprocal basis.

There are four GIDEP data interchanges/bases:

a. Engineering Data Interchange; containing engineering evaluation and qualification test reports, non-standard 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; containing failure rate/mode and replacement rate data on parts, components and materi-

als. Also contained are reports on R&M practices and procedures.

c. Failure Experience Data Interchange; containing objective failure information on parts, components, processes, fluids, materials and safety/fire hazards. Included is data from ALERT's and SAFE-ALERT's as well as other problem information and failure analyses.

d. Metrology Data Interchange; containing test equipment calibration procedures and metrology related engineering data on test systems, calibration systems, and measurement technology. It is a repository for the National Bureau of Standards metrology data and also provides a Management Information Service (MIS) for its participants.

Each element of the Naval Material Command directly engaged in the research, design, development, testing, production or support of mission-related Navy material is required to participate in GIDEP.

Further information on GIDEP may be obtained from:

GIDEP Operations Center
Fleet Analysis Center (Code 864)
Corona, CA 91720
Telephone: Comm. (714) 736-4677
Auto. X-933-4677

NAVMATINST 5200.35

D9 NATIONAL TECHNICAL INFORMATION SERVICE (NTIS)

The National Technical Information Service (NTIS) of the Department of Commerce is the primary focal point within the Federal Government for the collection, announcement, and dissemination of unclassified technical reports and data. More than 50 products and services are available from NTIS to industry and the general public on a purchase basis.

Current abstracts of NTIS documents and other records in various categories of interest are published in weekly "Abstract Newsletters." These are indexed. An all-inclusive biweekly journal, "Government Reports Announcements and Index," is published and available on an annual subscription basis.

NTIS data bases are accessible through commercial services. They can be searched at nominal cost through most Navy technical libraries.

NTIS, in 1981, assumed responsibility for the data base on unclassified research, planned or in progress, previously managed by the Smithsonian Science Information Exchange (SSIE), which has been disestablished. Unclassified DOD work unit (DD 1498) information is no longer available through NTIS, but is available to DTIC-registered users (see D3.1.1).

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: (703) 487-4600.

D10 NATIONAL REFERRAL CENTER

The National Referral Center assists people who have questions in science and technology. It does not itself attempt to provide technical answers or references to literature that might contain such answers but instead refers people to known sources of information (called "information resources" by the Center).

The data base for this free service is a subject-indexed inventory which contains descriptions of some 13,000 organizations with specialized knowledge in science and technology, including the social sciences. Broad selections from this data base are also occasionally published in the series, "A Directory of Information Resources in the United States," sold by the Superintendent of Documents, Government Printing Office.

In response to requests submitted by mail or by telephone, referral specialists will search the data base and furnish, normally within five days or less, a list of suggested points of contact (with name, address, phone number, what information services to expect, etc.).

To obtain free referral service, write or call:

National Referral Center
Library of Congress
Washington, D.C. 20540
Telephone: (202) 287-5670.

SELECTED REFERENCES ON TECHNICAL INFORMATION SERVICES

DODDIR 3200.12 (SECNAV 3900.43), "DOD Scientific and Technical Information Program"

DODREG 3200.12-R-1, "Research and Technology Work Unit Information System Regulation"

DODREG 3200.12-R-2, "Centers for Analysis of Scientific and Technical Information"

DODREG 3200.12-R-3, "Dissemination of DOD Technical Information"

DODINST 3204.1 (SECNAV 3900.40), "Independent Research and Development"

MIL-STD-847B, "Format Requirements for Scientific and Technical Reports Prepared by or for the Department of Defense"

SECNAVINST 3900.29, "Standard Format Requirements for Scientific and Technical Reports"

SECNAVINST 3900.40, "Policy and Assignment of Responsibilities for the Independent Research and Development Program"

SECNAVINST 3000.43, "Navy Scientific and Technical Information Program (STIP)"

OPNAVINST 3910.19, "Release of Research and Development Planning and Requirements Documents"

OPNAVINST 5500.33, "NICRAD (Department of the Navy/Industry Cooperative Research and Development) Program"

NAVMATINST 3900.4, "Advanced Planning Briefings for Industry (APBI)"

NAVMATINST 3900.11, "Industry Independent Research and Development (IR&D)"

NAVMATINST 3900.14, "Navy/Industry Cooperative Research and Development Program (NICRAD)"

NAVMATINST 3900.15, "Certification and Registration for Access to DOD Scientific and Technical Information"

NAVMATINST 5200.35, "Government-Industry Data Exchange Program; participation in"

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 which is depicted in Figure E-1. The responsibilities of assistant secretaries with major involvement in RDT&E are summarized with particular emphasis on the Under Secretary of Defense for Research and Engineering.

E1.1 Under Secretary of Defense, Research and Engineering (USDRE). The Under Secretary of Defense, Research and Engineering is the principal adviser and staff assistant to the Secretary of Defense in the fields of scientific and technical matters; basic and applied research; research, development, test, and evaluation of weapons, weapon systems, and Defense material; and design and engineering for suitability, producibility, reliability, maintainability; and environmental services. He supervises all research and engineering activities in the Department of Defense. The USDRE is designated as the Defense Acquisition Executive (DAE) (see E1.7).

*DODDIR 5129.1**

E1.1.1 Defense Advanced Research Projects Agency (DARPA). The Defense Advanced Research Projects Agency is a separately organized operating research and development agency of the Department of Defense under the direction and supervision of the Under Secretary of Defense, Research and Engineering. It is responsible for basic and applied research and development for such advanced projects as may be designated by the Secretary of Defense. The Agency utilizes the services of the military departments, other government agencies, individuals, private business entities, or educational or research institutions to carry on its projects.

DODDIR 5105.41

E1.2 Under Secretary of Defense for Policy (USDP). The Under Secretary of Defense for Policy is the principal advisor and assistant to the Secretary of Defense for all matters concerned with the integration of Departmental plans and policies with overall national security objectives. The USDP represents the Department of Defense as directed in matters involving the National Security Council, the Department of State, the Intelligence Community, and other departments, agencies and interagency groups with responsibilities in the national security area. He oversees, develops, and recommends, as appropriate, policies with regard to nuclear-related matters; intelligence; and plans and requirements for and capabilities of existing or proposed U.S. or foreign forces.

The USDP is a permanent member of the DSARC.

DODDIR 5111.1

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 his responsibilities.)

E1.4 Assistant Secretary of Defense (Comptroller) (ASD(C)). The Assistant Secretary of Defense (Comptroller) advises and assists the

*For additional information on subjects discussed in this Guide, consult the listed references. Titles, current editions, and promulgation dates of directives on which this edition is based can be found in the Master Reference List following the appendixes. When a DOD directive has been promulgated as an enclosure to a Navy directive, the promulgating directive is shown in parentheses following the DOD listing.

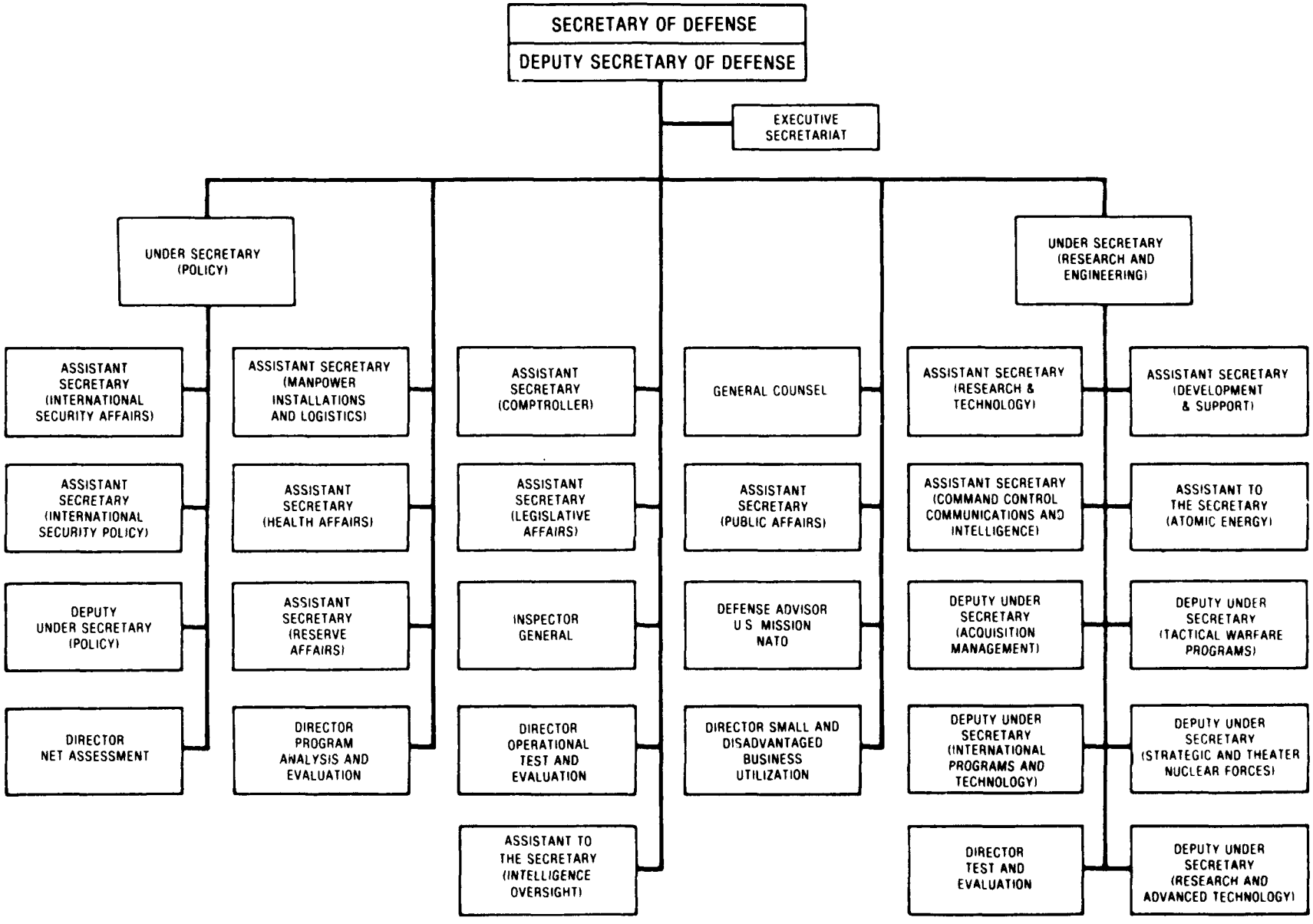

Figure E-1. Office of the Secretary of Defense

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. He 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 ASD(C) is a permanent member of the DSARC.

DODDIR 5118.3

E1.5 Assistant Secretary of Defense (Manpower, Installations, and Logistics) (ASD(MI&L)). The ASD(MI&L) is the principal staff adviser and assistant to the Secretary of Defense for DOD civilian and military personnel requirements, policy, and planning; reserve affairs; logistics; and installations management. Within these areas of responsibility, the ASD(MI&L) reviews and evaluates the manpower, personnel, and logistics implications of proposed weapon systems; reviews and evaluates recommendations concerning manpower and logistics requirements and priorities; and exercises staff supervision over the Director, Defense Logistics Agency. The ASD(MI&L) is a permanent member of the DSARC.

DODDIR 5124.1

E1.5.1 Weapon Support Improvement Group (WSIG). The WSIG is the principal advisory group to the DSARC for weapon support. The WSIG provides independent assessments to the DSARC for each review, including adequacy of manpower; training, logistic planning and resources; initial and long-term support concept; reliability and maintainability approach, improvements, readiness objectives, and acquisition strategy as applied to reducing support risks.

E1.6 Director, Program Analysis and Evaluation (DPA&E). The Director, Program Analysis and Evaluation has prime responsibility within DOD for systems analysis. In his areas of responsibility, which include weapon systems and major materiel items and support systems, the DPA&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 DPA&E is a permanent member of the DSARC.

DODDIR 5141.1

E1.7 Defense Acquisition Executive (DAE). The DAE, designated by the SECDEF, is his principal advisor and staff assistant for the acquisition of defense systems and equipment. He serves as a permanent member and the chairman of the DSARC. The USDRE is designated as the DAE. His responsibilities include:

- Integrate and unify the management process, policies, and procedures for defense system acquisition.
- Monitor compliance, by the DOD components, with the policies and practices in OMB Circular A-109, DODDIR 5000.1, and DODINST 5000.2.
- Ensure that the requirements and viewpoints of the functional areas are given consideration during staff and DSARC deliberations, and are integrated in the recommendations sent to the SECDEF.
- Ensure consistency in applying the policies regarding NATO RSI for major systems.

DODDIR 5000.1

E1.8 Defense Agencies

E1.8.1 The Defense Nuclear Agency (DNA). The Defense Nuclear Agency (DNA) is responsible for consolidated management and direction for the Department of Defense nuclear weapons, weapons effects, and nuclear weapons test programs. It maintains overall surveillance and provides direction, coordination, advice, or assistance, as appropriate, on major actions

affecting the nuclear stockpile including composition, development, production, allocation, storage, modification, maintenance, retirement, and stockpile management services. In carrying out this responsibility, DNA acts as the central coordinating agency for the Department of Defense with the Nuclear Regulatory Commission (NRC) on matters pertaining to nuclear weapons; advises and assists the Joint Chiefs of Staff in the development of recommendations concerning the stockpile composition, allocation, and dispersal of nuclear weapons; and plans, programs, conducts, or sponsors a variety of training activities.

The DNA is organized into a headquarters in Washington, D.C., Test Command and a Field Command in Albuquerque, New Mexico, and the Armed Forces Radiobiology Research Institute in Bethesda, Maryland.

DODDIR 5105.31

E1.8.2 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.

DODDIR 5105.19 (OPNAV 5410.12)

E1.8.3 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.

DODDIR 5105.36

E1.8.4 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 DSARC 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 RDT&E 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.

DODDIR 5105.21

E1.8.5 Defense Logistics Agency (DLA). The DLA mission is to (1) function as an integral element of the Defense military logistics system

and, as such, direct its efforts and operations toward logistics support of the missions of the Military Departments and the Unified and Specified Commands under all conditions of peace and war; (2) provide effective and economical support to the military Services, other DOD components, Federal civil agencies, foreign governments, and others as authorized, for assigned material commodities and items of supply, logistics services directly associated with the supply management function, and other support services as directed by the Secretary of Defense, including automatic data processing under the policy guidance of the ASD (Comptroller); and (3) administer the operation of DOD programs as assigned.

One of DLA's responsibilities under its mission is to provide assigned contract administration service in support of the Military Departments, other DOD components, Federal civil agencies, and, when authorized, to foreign governments and others.

DLA activities providing services in support of RDT&E organizations include the Defense Technical Information Center (DTIC) (see D2) and the Defense Contract Administration Services Regions (DCASR).

The nine DCASRs provide contract administration services including the performance of contract administration, production, quality assurance, and data and financial management activities and administration of small business/labor surplus programs, within the United States and such external areas as specifically authorized.

DODDIR 5105.22

E1.8.6 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.

DODDIR 5100.23 (OPNAV 5410.17)

E2 OFFICE OF THE SECRETARY OF THE NAVY

SECNAVINSTS 5430.7, 5430.67

E2.1 Assistant Secretary of the Navy (Research, Engineering, and Systems) (ASN(R,E&S)).

E2.1.1 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; Navy acquisition programs up to the point at which the decision is made to transition to full-scale production, including policy and administration of affairs related thereto with the exception of the acquisition of naval ships funded by the appropriation SCN (see Figure E-2).

E2.1.2 Relationships. In the performance of the above responsibilities the ASN(R,E&S) is responsible for liaison with the Under Secretary of Defense for Research and Engineering 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 progress and with the Chief of Naval Material, DCNO(MPT), and the Commander NAVMEDCOM on the execution of RDT&E programs. The ASN(RE&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 Research, Development, and Logistics.

The ASN(R,E&S) is also responsible for supervision of the Office of Naval Research.

E2.1.3 Organization. In addition to Principal Deputy and various aides, ASN(R,E&S) has

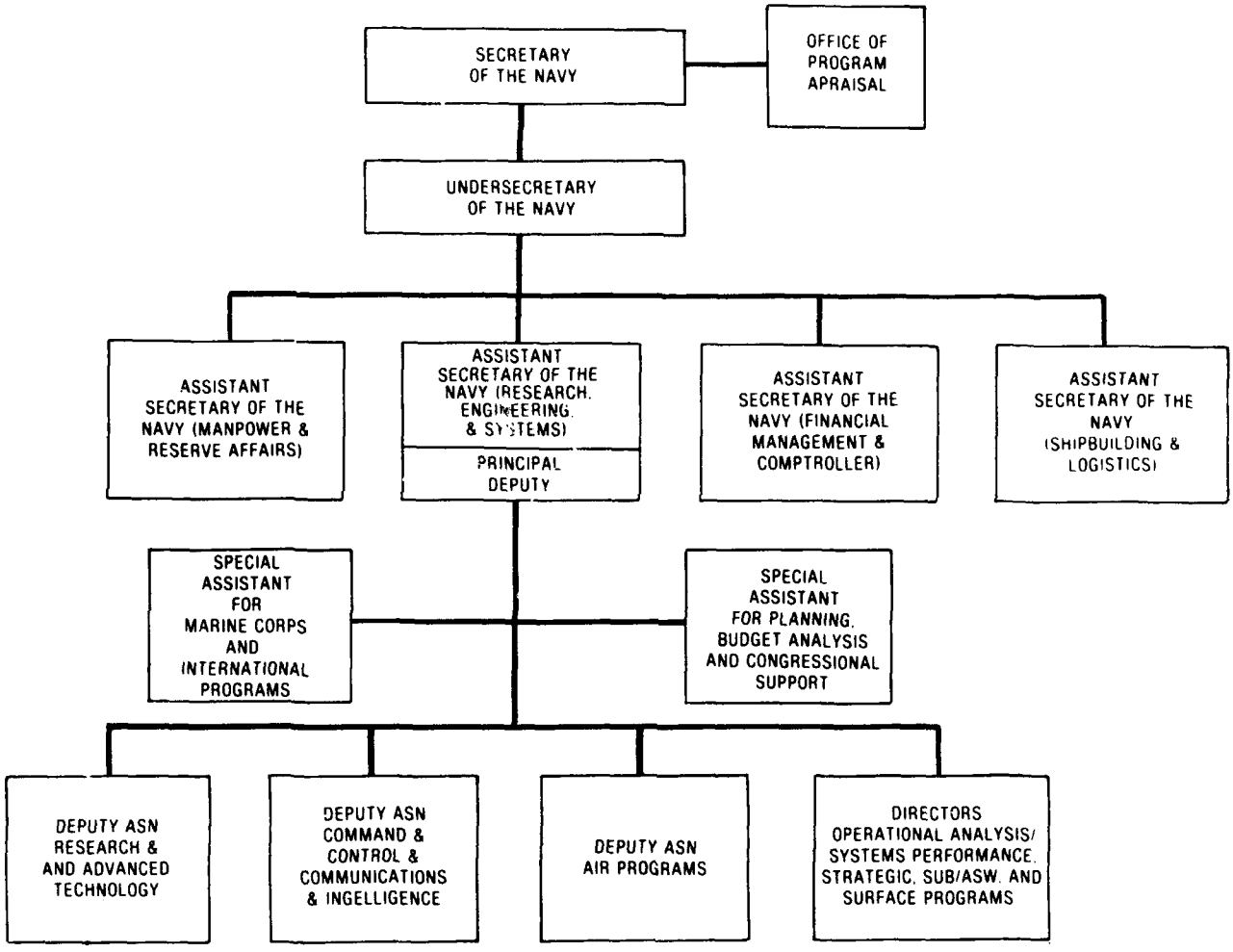

Figure E-2. Office of the Secretary of the Navy

a Special Assistant for Marine Corps and International Programs and a Special Assistant for Planning, Budget Analysis, and Congressional Support.

Staff elements are headed by Deputy ASNs for Research and Advanced Technology, Command and Control and Communications and Intelligence, and Air Programs; and Directors of Operational Analysis/Systems Performance, Strategic, Sub/ASW, and Surface Programs.

The principal advisors to the ASN(R,E&S) are the Director, Research, Development, Test and Evaluation (OP-098); the Deputy Chief of Staff (RD&S) Marine Corps; the Chief of Naval Research; and the Chief of Naval Development. He is advised and assisted by the Oceanographer of the Navy and the Director of Navy Laboratories (DNL) in their respective areas.

E2.2 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.

SECNAVINST 5430.60

E3 OFFICE OF THE CHIEF OF NAVAL OPERATIONS (OPNAV)

OPNAVINST 5430.48, "OPNAV Organization Manual"

The Chief of Naval Operations is the senior military officer of the Department of the Navy and takes precedence above all other officers of the naval service, except an officer of the naval service who is serving as Chairman of the Joint Chiefs of Staff. He is the principal naval advisor to the President and to the Secretary of the Navy on the conduct of war, and the principal naval advisor and naval executive to the Secretary on the conduct of activities of the Department of the Navy. The Chief of Naval Operations is the Navy member of the Joint Chiefs of Staff.

He commands the Operating Forces of the Navy, the Naval Material Command, and such shore activities as may be assigned to him by the Secretary of the Navy. He is responsible to the Secretary of the Navy for the utilization of resources by and the operating efficiency of all commands and activities under his command.

In carrying out these general responsibilities, he determines the needs of naval forces and activities for research, development, test, and evaluation; plans and provides for the conduct of development, test, and evaluation which are adequate and responsive to long-range objectives, immediate requirements, and fiscal limitations; and provides assistance to the ASN(R,E&S) in the direction, review, and appraisal of the overall Navy RDT&E Program to insure fulfillment of stated requirements.

The CNO is assisted in carrying out his responsibilities by the Office of the Chief of Naval Operations (OPNAV). The organization of OPNAV is depicted in Figure E-3.

RDT&E matters are the primary responsibility of CNO's Director, Research, Development, Test and Evaluation, OP-098. However, several other DCNOs and DMSOs have RDT&E-related responsibilities, particularly in the determination of requirements and decisions on production of new systems and equipments. Each DCNO acts as sponsor for system acquisitions which are within his sphere of responsibility or are judged to be principally so.

E3.1 Deputy Chief of Naval Operations (Manpower, Personnel, and Training) (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

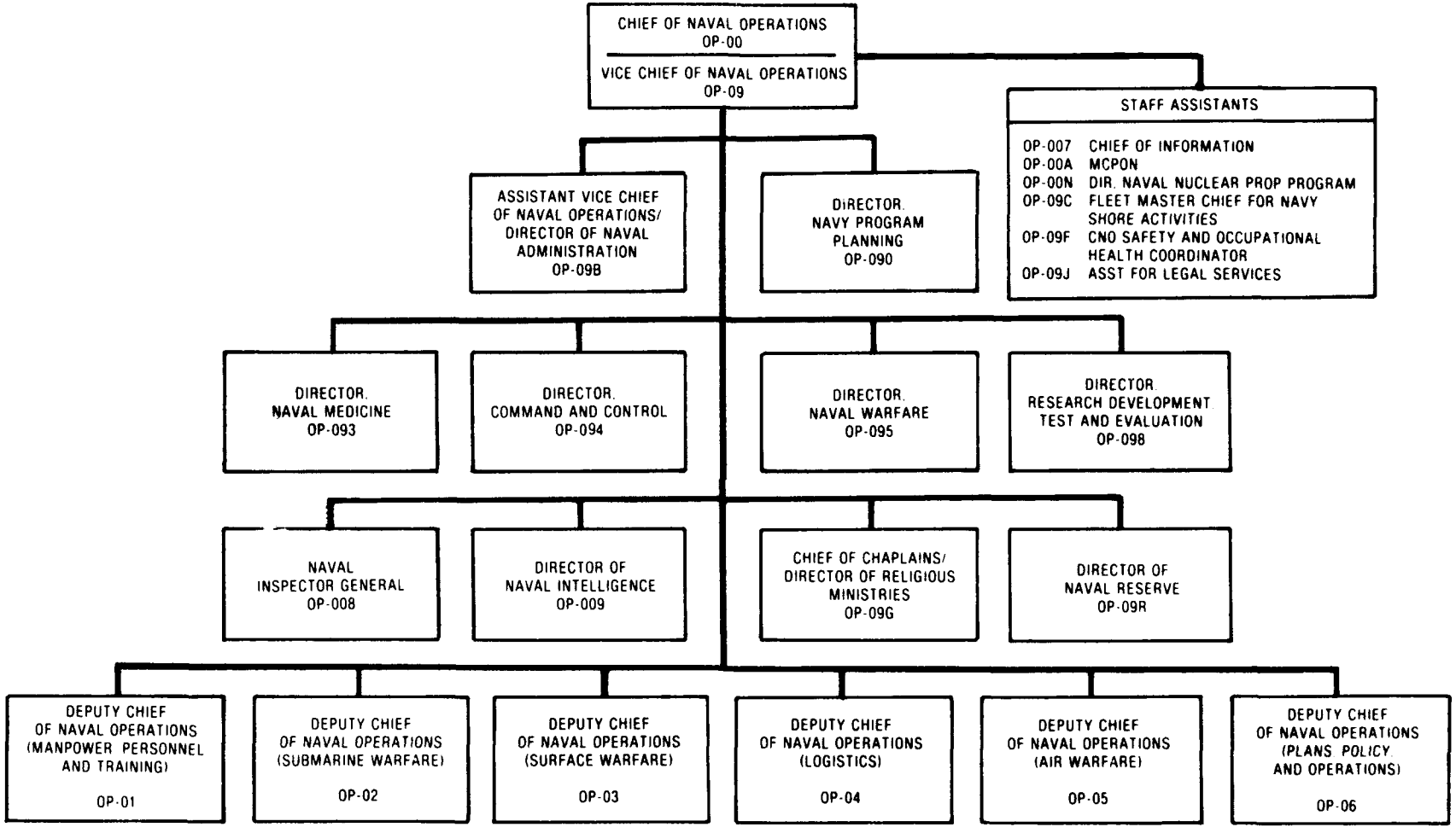

Figure E-3. Office of the Chief of Naval Operations (OPNAV)

other sponsors for ensuring validity and feasibility of requirements for new equipment and weapon systems. In addition he determines RDT&E objectives and 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 Deputy Chief of Naval Operations (Submarine Warfare) (OP-02). The DCNO (Submarine 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 and deep submergence systems, and in such planning, preparation, and execution as are incident thereto; acts as his principal advisor on submarine and deep submergence systems matters; fulfills his responsibilities in respect to readiness, training, and preparation for war; exercises for him 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 his representative in these matters involving relationships with other governmental agencies; and, in coordination with the Director of Naval Warfare (OP-095), develops overall submarine force levels and requirements.

E3.3 Deputy Chief of Naval Operations (Surface Warfare) (OP-03). The DCNO (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 his responsibilities with respect to operational readiness, training and preparation for war of surface ships (less carriers and submarine support ships); acts as his 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 Director of Naval Warfare (OP-095), 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 Deputy Chief of Naval Operations (Air Warfare) (OP-05). The DCNO (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 his principal advisor on naval aviation matters, including air warfare, and as his representative in naval air operational matters involving relationships with other government and civil agencies; and, in coordination with the Director, Naval Warfare, 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) develops and disseminates plans and policies and serves as the principal advisor to the Chief of Naval Operations on Joint Chiefs of Staff matters and as the principal advisor to the Secretary of the Navy and the Chief of Naval Operations on strategic planning, nuclear systems, National Security Council affairs, international politico-military matters, technology transfer, foreign military assistance and naval operational information.

DCNO (Plans, Policy and Operations) plays a major role in the development of the structure of

long-range Navy capability objectives which it is the function of RDT&E to make attainable through development of required technological capabilities.

E3.7 Director, Navy Program Planning (OP-090). The Director, 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 Director, 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 he directs the budget process, including supervision of related financial management matters. Thus, the Director, Navy Program Planning exercises a broad and profound influence on all Navy programs, including RDT&E programs.

E3.7.1 General Planning and Programming Division (OP-90). Under the direction of the Director, Navy Program Planning, OP-90 develops and operates the integrated program planning system for the Chief of Naval Operations, and implements the responsibilities of the Director, Navy Program Planning with regard to Navy programs and related plans.

E3.7.2 Program Resources Appraisal Division (OP-91). OP-91 evaluates the relative effectiveness of alternatives in programs and program proposals; manages the CNO Studies and Analyses Program, coordinates it with other Navy Department study efforts, and reviews and evaluates study results; implements the responsibilities of the Director, Navy Program Planning for conducting scientific, analytical and technical studies through the medium of the Center for Naval Analyses; provides a cost analysis capability and an independent cost estimating and review capability for the Chief of Naval Operations and the Secretary of the Navy; and supports the Chief of Naval Operations with respect to the extended planning objectives of the Navy, including those pertaining to the total strategic, tactical and technological future of seapower and other maritime-related matters involving the security and well-being of the United States.

E3.8 Director, Command and Control (OP-094). The Director, Command and Control exercises centralized coordination over policy, planning, and integration of requirements for Navy Command and Control (C^2), including command and control, space exploitation (including space defense matters), reconnaissance, ocean surveillance (less Submarine Ocean Systems Underwater Surveillance (SOSUS)), electronic warfare, operational security (OPSEC), signal security (SIGSEC), military deception and psychological operations; implements the responsibilities of the Chief of Naval Operations with respect to determination of characteristics, development, appraisal, and coordination of program execution for C^2 systems; acts as principal advisor to the CNO on C^2 matters; and acts as his representative to other services and agencies for matters (involving the above), including the Worldwide Military Command and Control System (WWMCCS).

E3.9 Director, Naval Warfare (OP-095). The Director, 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.

E3.9.1 Director, Naval Oceanography Division (OP-952)/Oceanographer of the Navy. OP-952 plans, coordinates, and executes those functions assigned to the Director, Naval Warfare that pertain to Naval Oceanography (oceanography, meterology, mapping charting, geodesy, astrometry, and chronometry). He 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, he acts for SECNAV and CNO in interagency and international matters involving Naval Oceanography.

E3.9.2 Commander, Naval Oceanography Command. The Commander, Naval Oceanogra-

phy Command, located at Bay St. Louis, Mississippi, is responsible for the management of assigned oceanographic; 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.

SECNAVINST 5430.79; OPNAVINST 5450.165

E3.10 Director, Research, Development, Test and Evaluation (DRDT&E) (OP-098). The DRDT&E implements the responsibilities of the Chief of Naval Operations and assists the Assistant Secretary of the Navy (Research, Engineering, and Systems) with respect to coordination, integration, and direction of the Navy Research, Development, Test, and Evaluation (RDT&E) Program.

In carrying out these responsibilities, the DRDT&E acts for the Chief of Naval Operations as sponsor of the appropriation RDT&E,N; manages the planning and reporting procedures for the conduct of the RDT&E program; coordinates the formulation of and promulgates RDT&E requirements resulting from the concerted efforts of OPNAV, ensuring that technology is harnessed to the functional/mission tasks of the DCNO/DMSOs; coordinates exchange of RDT&E information; supervises the formulation of the Navy Program Objectives and annual budget for RDT&E; and appraises the progress of RDT&E effort, recommending projects for curtailment, suspension, cancellation, substitution, or advancement, as appropriate. He serves as principal advisor to the ASN(R,E&S), exercising specific responsibilities for financial management and control of RDT&E,N operating budget allocations, including certain "below threshold" program change authority; develops plans and policies for international cooperative R&D and advises on implications of foreign R&D efforts; advises the CNO, in consonance with other DCNOs and DMSOs, on all RDT&E matters relating to nuclear energy and Navy space programs; and coordinates and acts as central manager for nonweapon nuclear programs. The DRDT&E provides policy guidance to and exercises technical direction of COMOPTEVFOR in matters relating to Navy RDT&E programs. He acts as OPNAV focal point for NDCPs and DCPs; maintains cognizance of naval personnel requirements and monitors the functions and performance of naval personnel attached to USDRE and DARPA; and sponsors for the CNO all range and target matters.

The organization of the Office of Director RDT&E is depicted in Figure E-4. Responsibilities of various officials and offices within the organization are detailed below.

E3.10.1 Special Assistant for Intelligence (OP-098D). Acts as the principal advisor, coordinator, and control and liaison point for the Director RDT&E on matters pertaining to intelligence. This is an additional duty billet for the Director, Technology Assessment Division.

E3.10.2 Assistant for Medical and Allied Sciences (OP-098E). Advises and assists in the implementation of responsibilities of the Director RDT&E and the Assistant Secretary of the Navy (R,E&S) (as required) in respect to the application of medical and allied sciences to the planning, programming, and appraising of Research, Development, Test, and Evaluation (RDT&E). Acts as Development Coordinator for advanced medical RDT&E programs.

E3.10.3 Assistant for International Research and Development (OP-098F). Develops plans and policies for international cooperative R&D of military equipment for naval use.

E3.10.4 Assistant for RDT&E Acquisition Management (OP-098R). Serves as the Special Assistant for acquisition management to the Director, RDT&E. Responsibilities of the billet include support of the Director and of the OP-098 divisions in their responsibilities for management of the acquisition of Navy systems; monitoring of DOD acquisition procedures; revision and promulgation of acquisition management directives; and representation of the Director in matters relating to acquisition management.

E3.10.5 Navy Member, DOD Air Munitions Requirements and Developments (AMRAD) Committee (OP-098W). Assists the Under Secretary of Defense, Research and Engineering (USDRE), the Joint Chiefs of Staff (JCS), the Military Departments and other DOD Components in assuring, where practical, joint

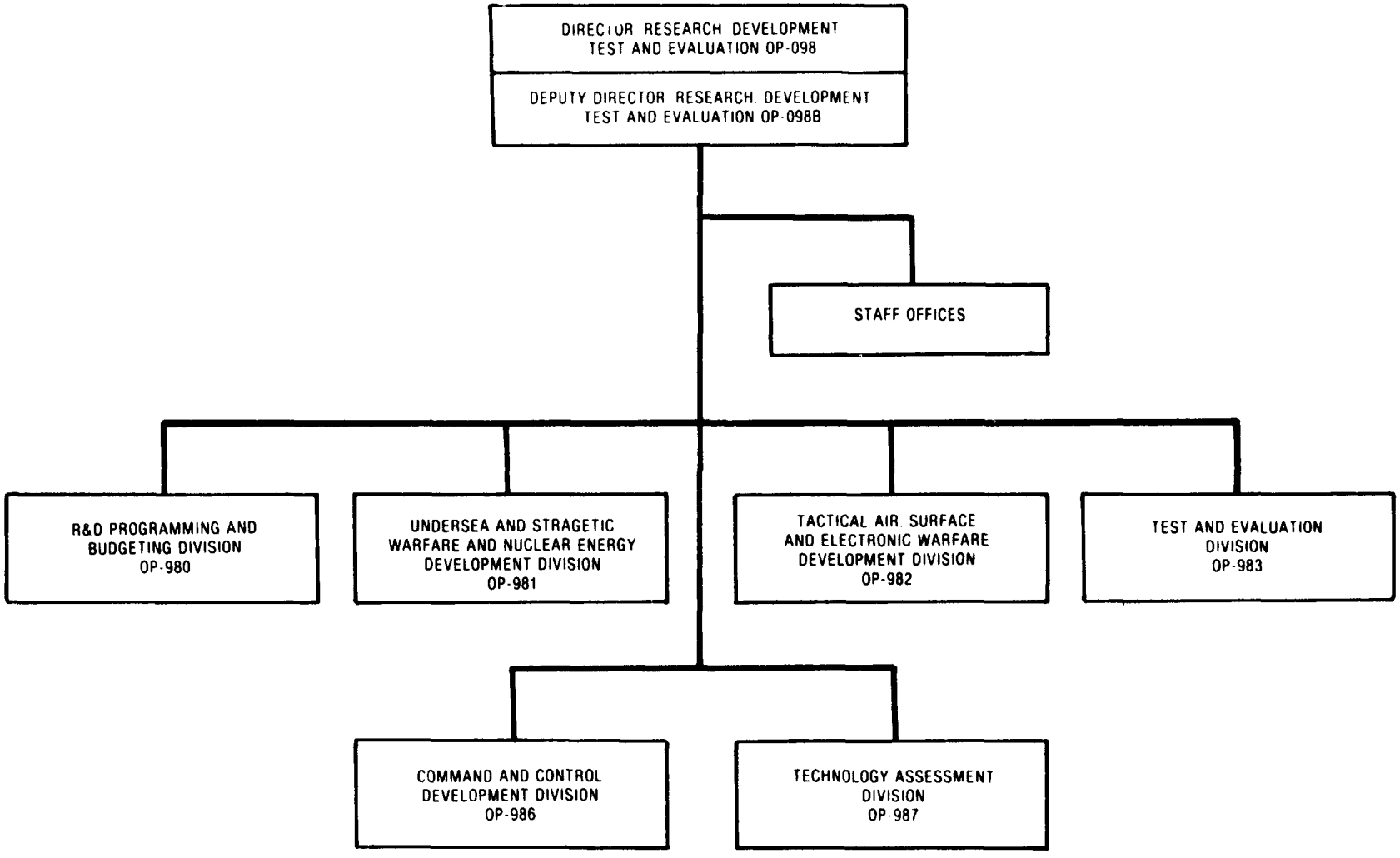

Figure E-4. Office of the Director, Research, Development, Test and Evaluation (OP-098)

use of qualitative requirements and design standardization of air and other munitions to fulfill the needs of more than one Service.

E3.10.6 R&D Programming and Budgeting Division (OP-980). Implements the programming and budgeting, Congressional relationships, and nuclear energy systems responsibilities of the Director RDT&E with respect to Research, Development, Test, and Evaluation programs.

E3.10.7 Undersea and Strategic Warfare Development Division (OP-981). Implements the responsibilities of the Director RDT&E for the coordination, integration, and direction of the Navy Research, Development, Test, and Evaluation programs in the field of undersea warfare, including undersea surveillance; strategic warfare, including offensive and defensive systems; nuclear energy and weapons; and the coordination, integration, and direction of all nonweapon nuclear matters.

E3.10.8 Tactical Air, Surface and Electronic Warfare Development Division (OP-982). Implements the responsibilities of the Director RDT&E for the coordination, integration, and direction of those Research, Development, Test, and Evaluation (RDT&E) programs concerned with air, surface, and electronic warfare development matters.

E3.10.9 Test and Evaluation Division (OP-983). Implements the responsibilities of the Director RDT&E with respect to cognizance over planning, conduct, and reporting of all air, surface and undersea/strategic test and evaluation (see G2 2.3 for detailed functions).

E3.10.10 Command and Control Development Division (OP-986). Implements the space and command and control responsibilities of the Director RDT&E; advises the CNO on all matters pertaining to the Navy space program; directs all space-related matters of concern to the CNO, including R&D; and directs and coordinates the prosecution of astronautic R&D.

E3.10.11 Technology Assessment Division (OP-987). Performs technology assessment in support of the Navy RDT&E Program; provides a continuing overview of technological developments and their implications for operational needs; serves as the principal technology interface between OPNAV and ASN (R,E&S); and provides scientific and technological assistance required by the Director, RDT&E.

E4 NAVAL MATERIAL COMMAND

OPNAVINST 5450.176; NAVMATINSTS 5430.60, 5460.2; Navy Regulations 1973

The Naval Material Command (NMC or NAVMAT) consists of the Headquarters Naval Material Command (HQNAVMAT), the Naval Systems Commands, separately organized program management offices, Research and Development Centers, and other shore activities as assigned by the Chief of Naval Operations.

The basic concept of the Naval Material Command is that of a single, integrated material support agency under the Chief of Naval Operations with central responsibility and accountability for total weapon/support systems development, procurement, production, and support, including human operator integration, depot maintenance, supply management, facility support, and integrated logistic support planning.

The organization of the Naval Material Command is depicted on Figure E-5. R&D Centers are discussed in Appendix F.

E4.1 Chief of Naval Material (CNM). The Chief of Naval Material, under the command of the Chief of Naval Operations, commands the Naval Material Command. In addition to such other tasks as may be assigned by the Chief of Naval Operations, he:

- Meets the total system and material support needs of the operating forces of the Navy for equipment, weapons and weapon systems, materials, supplies, facilities, maintenance, and supporting services, including the development, acquisition, procurement, construction, maintenance, alteration, repair, and overhaul of ships, aircraft, surface and undersea craft, space and oceanographic systems, and equipment; training equipment and devices; land vehicle systems and equipment; fixed ocean systems; and shore facilities and

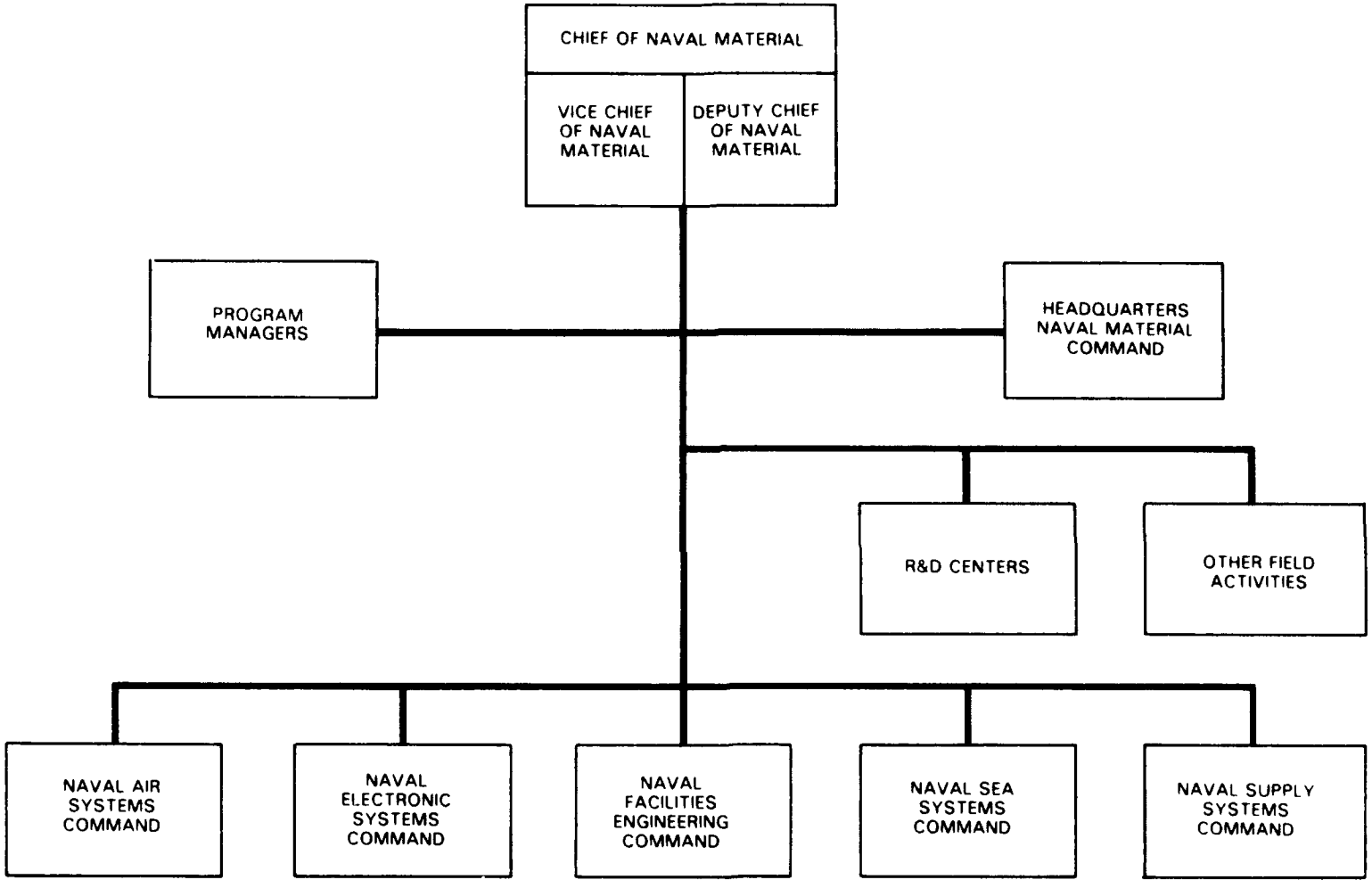

Figure E-5. Naval Material Command

utilities, all consistent with approved programs.

- Responds directly to the Commandant of the Marine Corps in meeting those particular support needs of the Marine Corps which are required to be provided by the Naval Material Command.
- Responds to the heads of other Department of Defense and Department of the Navy organizations in meeting their material support needs (including those of the Naval Reserve) that are provided by the Naval Material Command.

E4.2 Headquarters Naval Material Command (HQNAVMAT). HQNAVMAT is the staff office of the CNM, assisting him in formulating major policy, objectives, and priorities; in organizing, assigning work to, and allocating resources among Command components; in coordinating efforts and monitoring progress as necessary; and in appraising performance, efficiency and policy compliance. HQNAVMAT officials are not in the chain of command over line components. The Headquarters performs executive functions only by exception, as approved by the Chief of Naval Material.

The organization of HQNAVMAT is depicted in Figure E-6. The missions of the various DCNMs are described in this section.

E4.2.1 Deputy Chief of Naval Material for Resources Management (DCNM(RM)) (MAT-01). The DCNM(RM) is responsible to the CNM in the areas of programming, budgeting, financial management, financial reporting, cost estimating, financial program appraisal; total force manpower management for the NMC and HQNAVMAT, civilian personnel management, human resources management, equal employment opportunity; and Commercial Activities (CA) Program.

In these areas, the DCNM(RM) formulates overall NMC policy; interprets and establishes policies and procedures for the entire NMC in support of the Planning, Programming and Budgeting System (PPBS); provides guidance to SYSCOMs and PMs relative to programming and financial management; and serves as NMC point of contact with the CNO Fiscal Management Division (OP-92) and NAVCOMPT.

E4.2.2 Deputy Chief of Naval Material for Contracts and Business Management (DCNM(C&B)) (MAT 02). The DCNM(C&B) is responsible for contracting and contract administration and for business management and strategy within the Naval Material Command. In addition, the DCNM(C&B) provides staff assistance to ASN(S&L) and performs other functions relating to contracts and business management as delegated by SECNAV.

E4.2.3 Deputy Chief of Naval Material for Logistics (DCNM(L)) (MAT-04). The DCNM(L) has cognizance over policies, planning, programming, participation in budget reviews, evaluation, and implementation of NMC logistics programs, including fleet readiness assessments; maintenance policy and interservicing: logistics training policy, plans, and resources; acquisition logistics program planning and assessment; safety, fire protection, facilities, energy and environment; nuclear weapons safety and in-service logistics; and physical security. As senior command logistics official, he is responsible to CNM for logistics planning and strategy and for the effective and efficient management of all programs and functions within his area of cognizance.

E4.2.4 Deputy Chief of Naval Material for Laboratories (DCNM(Labs)) (MAT 05). The DCNM(Labs) serves as the CNM's principal executive and line manager with delegated authority and responsibility for the direction and control of the operations of the echelon three NMC R&D Centers. His responsibilities include: (1) managing the following R&D Centers: Naval Air Development Center, Naval Underwater Systems Center, David W. Taylor Naval Ship Research and Development Center, Naval Ocean Systems Center, Naval Weapons Center, Naval Surface Weapons Center, Naval Coastal Systems Center, Navy Personnel Research and Development Center, and Naval Training Equipment Center; (2) acting as subclaimant for laboratory resources within the Naval Material Command, (3) implementing DOD policies and procedures; directing and coordinating the preparation of the long-range corporate plans; assessing, justifying, obtaining, and allocating manpower, facilities, special equipment, ADP, and other support resources required by the NMC R&D Centers, (4) defining the broad roles, missions, and functions of the NMC R&D Centers; establishing

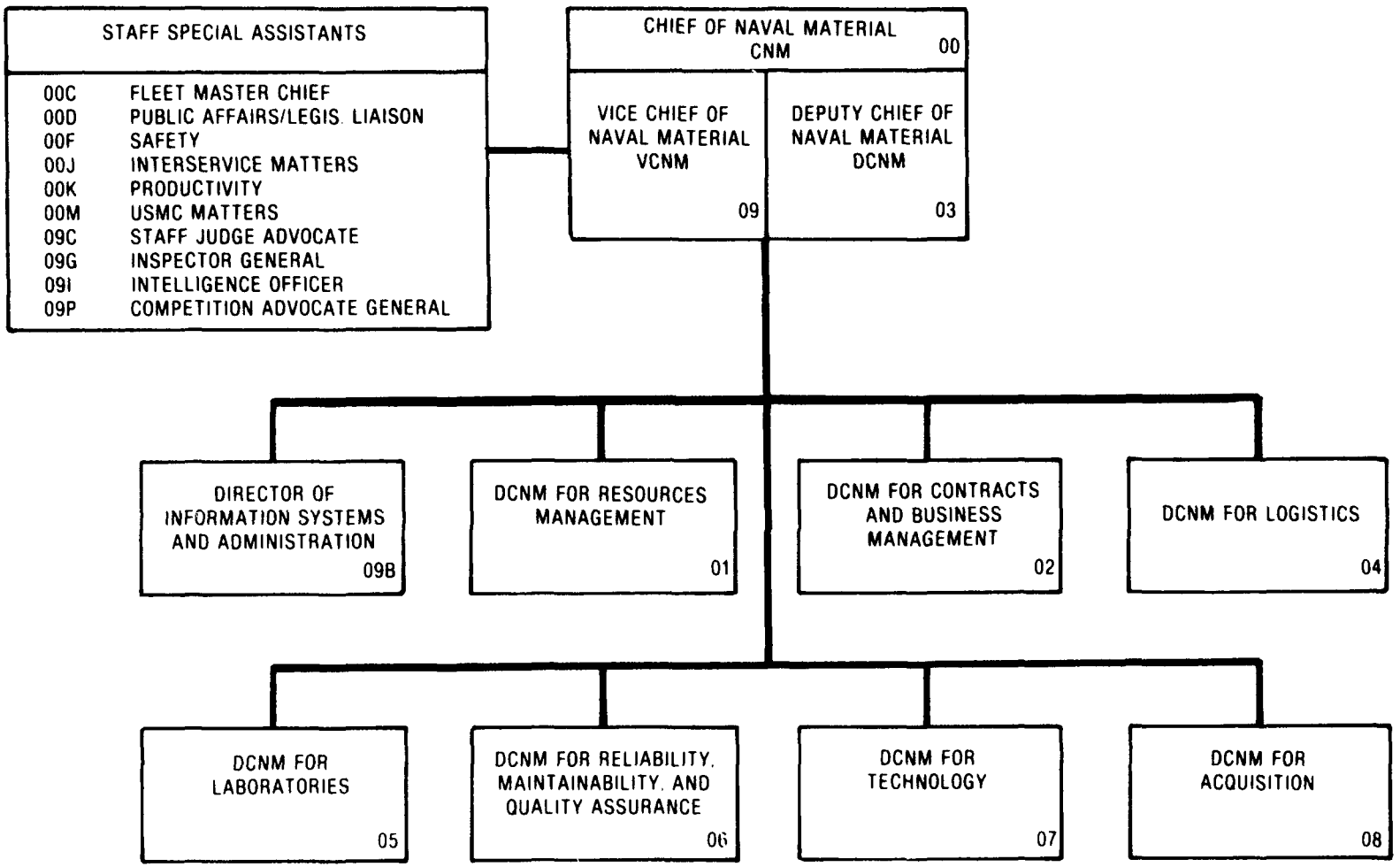

Figure E-6. Headquarters Naval Material Command

high standards and procedures for the selection and appointment of the Center Commanding Officers and Technical Directors; planning, budgeting and allocation of the Independent Research and Independent Exploratory Development Programs; and ensuring that the technical views, major program concerns, and problems of the Centers are communicated promptly to the CNM and to higher levels of authority within the DON.

The DCNM(Labs) serves also as the Director of Navy Laboratories (DNL), providing staff and advisory assistance directly to the ASN(R,E&S). (See F2.1)

E4.2.5 Deputy Chief of Naval Material for Reliability, Maintainability, and Quality Assurance (DCNM(RMQA)) (MAT-06). The DCNM(RMQA) is responsible to the CNM in the areas of reliability, maintainability, and quality assurance standards, policy, and appraisal; quality and reliability assurance (Q&RA) career management; and manufacturing technology. In carrying out these responsibilities, the DCNM(RMQA) establishes procedures and requirements, and coordinates, reviews, and evaluates the application of reliability, maintainability, quality and production readiness assurance measures in the systems acquisition and rework/overhaul processes.

E4.2.6 Deputy Chief of Naval Material for Technology (DCNM(T)) (MAT-07). The DCNM(T) reports to the Chief of Naval Material for matters related to the technology base and to technical information. The DCNM(T) billet on CNM staff is held as additional duty by the Chief of Naval Research (CNR). The DCNM(T) is also the Chief of Naval Development (CND), reporting to the Assistant Secretary of the Navy (R,E&S). The responsibilities of the CND/DCNM(T) include managing the Department of the Navy Exploratory Development Program and developing, coordinating, and assessing technology development and demonstration.

E4.2.6.1 Office of Naval Technology (ONT). The Office of Naval Technology implements the responsibilities of the CND/DCNM(T) for management of the Navy Exploratory Development Program.

NAVMATINST 3910.20

E4.2.7 Deputy Chief of Naval Material (Acquisition) (DCNM(A)) (MAT-08). The DCNM(A) is the senior Naval Material Command acquisition official reporting to the CNM for matters associated with the Navy material acquisition process, except technology base matters. His responsibilities encompass matters associated with program evaluation; systems engineering; production; test and evaluation; acquisition and program management policy; and civilian and foreign technology transfer; acquisition research; acquisition career management; energy and natural resources R&D; and embedded computers.

E4.3 CNM-Designated Programs. Following are brief descriptions of currently active CNM-Designated Programs (PMs reporting directly to the CNM). In addition, there are about fifty Systems-Command-Designated Programs (PMs reporting to and chartered by a Systems Commander, with the approval of CNM).

A program management office is intended to be a temporary organization. It is established to get a specific job done, after which it is normally disestablished. Thus, new program offices are constantly being established and old ones phased out.

E4.3.1 Strategic Systems Program (PM-1). Objective: To direct the acquisition of Polaris, Poseidon, Trident I, and Trident II fleet ballistic missile weapon systems, provide operational support for the FBM weapon systems, and direct planning and development of Trident-related shore activities.

NAVMATINST 5430.37

E4.3.2 Joint Cruise Missile Program (JPM-3). Objective: To manage, direct, control, and integrate all Navy/Air Force effort involved in the development, test, and evaluation of the air-launched cruise missile (ALCM) T mahawk, ground-launched cruise missile (GLCM), and such other cruise missile projects as may be directed.

NAVMATINST 5430.59

E4.3.3 Antisubmarine Warfare System (ASWS) Program (PM-4). Objective: To provide centralized management of all ASW efforts

within the NMC, including all aspects of management, technical direction, and control of the development, production, and support of ASW components and systems for aircraft, surface ships, submarines, and fixed installations including (1) components and systems engineering; control of interfaces with other systems and with the platforms; integration of components and systems; test planning and conduct of tests; technical evaluations and analyses; procedures, specifications, and other documentation, and (2) ASW components and systems, including those for surveillance, detection, classification, localization, data-processing/ASW weapons; ASW weapon launchers, ASW weapons handling and stowage; supporting test and training equipment; and those aspects of test and fleet weapons ranges that support the ASWS Programs.

NAVMATINST 5430.28

E4.3.4 Saudi Naval Expansion Program (SNEP) (PM-5). Objective: To manage, control, direct, and integrate all efforts within the Navy involved with assisting the Saudi Arabian Government in the acquisition and operation of an integral and self-contained naval establishment. This includes validation of requirements and specifications for facilities, acquisition of ships, training, and operation and maintenance of the shore establishment.

NAVMATINST 5430.61

E4.3.5 Theater Nuclear Warfare Program (PM-23). Objective: To provide research, development, acquisition, and life-cycle management of nuclear warheads intended for use with Navy and Marine Corps theater nuclear systems and to provide oversight management of programs concerning nuclear survivability and combat effectiveness of systems exposed to nuclear weapons environments.

NAVMATINST 5430.62

E5 DUTIES AND RESPONSIBILITIES OF THE SYSTEMS COMMANDS

NAVMATINST 5460.2, NMC Organization Manual

E5.1 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, and advance base outfitting of naval material for which the command is assigned responsibility. In addition individual Systems Commands are tasked to perform NMC-wide 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.

E5.2 Naval Air Systems Command. (See Figure E-7)

- 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 air-launched 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 GFE for the foregoing.

E5.3 Naval Electronic Systems Command.

(See Figure E-8)

- Command/control/communications (C^3) (platform to platform).
- Underseas and space surveillance (includes shore communications).

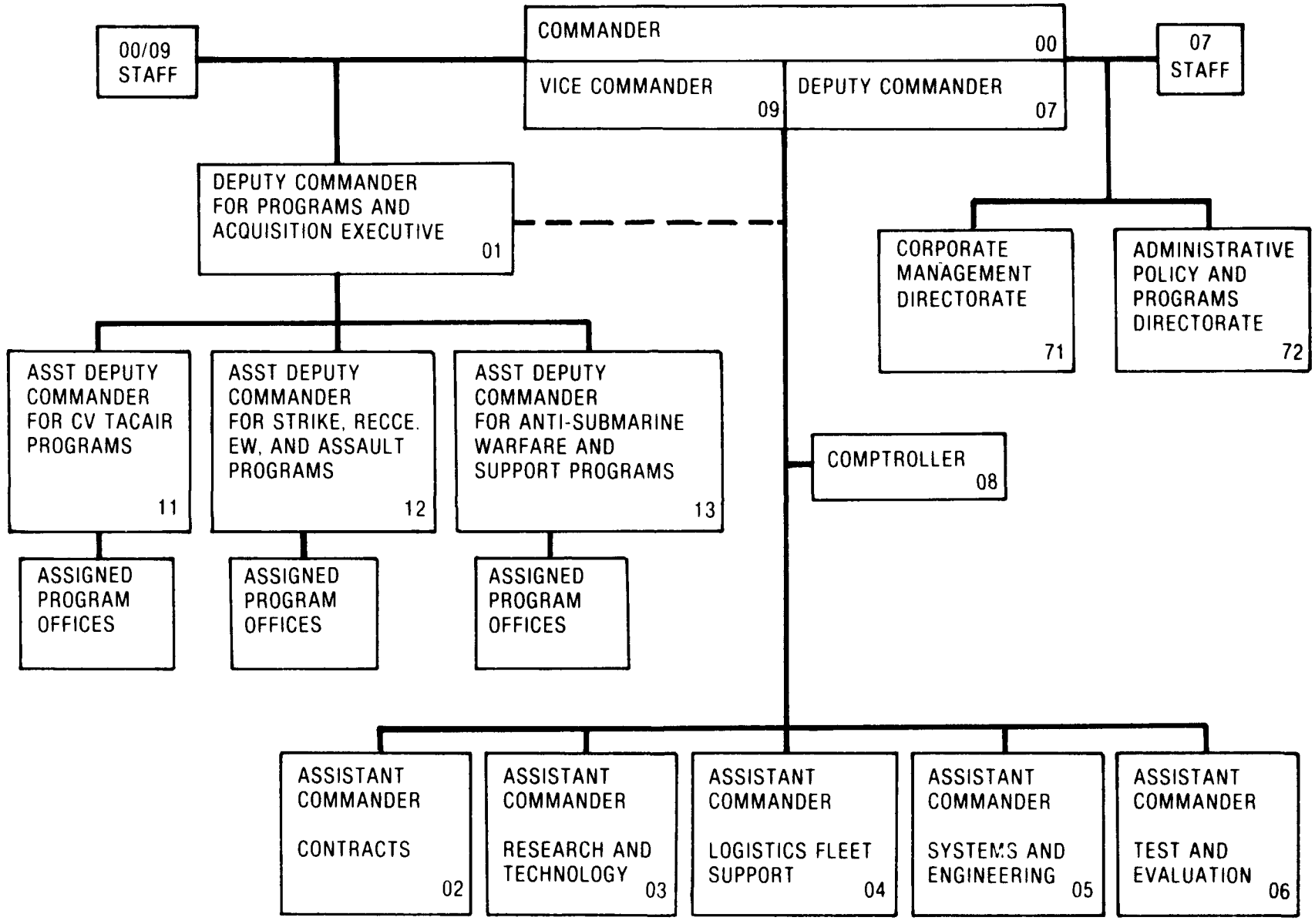

Figure E-7. Naval Air Systems Command Headquarters

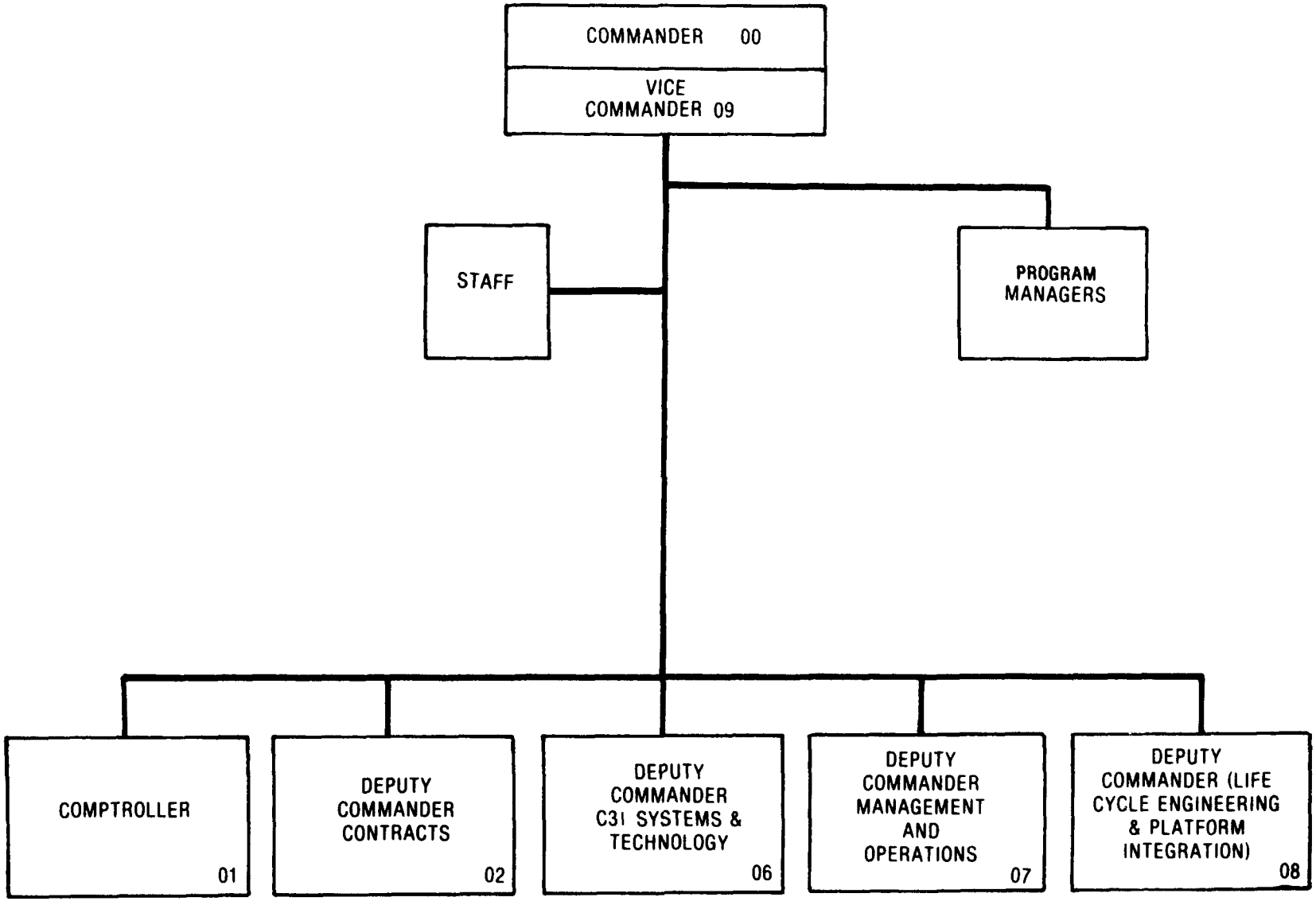

Figure E-8. Naval Electronic Systems Command Headquarters

- Navigation aids, air traffic control, and automatic landing systems, less airborne.
- Marine Corps expeditionary and amphibious electronics.
- Electronic warfare including ECM (Electronic Warfare Support Measures), ECM systems, and ECCM (less airborne).
- Multiplatform electronic systems not otherwise assigned.
- Intelligence and intelligence-collection systems.
- Space systems.
- Cryptographic and criptologic equipment.

E5.4 Naval Facilities Engineering Command.

- Shore facilities and fixed surface and sub-surface 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 sub-surface ocean structures.
- Materials and appliances for defense ashore against chemical, biological, and radiological warfare.

E5.5 Naval Sea Systems Command.

(See Figure E-9)

- Ships, submersibles, and other sea platforms.
- 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, 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.

E5.6 Naval Supply Systems Command.

- Serves as lead SYSCOM for logistics research and development.
- Materials-handling equipment not otherwise assigned.
- Providing technical direction for bulk fuel programs within the Navy, including facilities management, technical operations, and quality surveillance.
- Special clothing not otherwise assigned.
- Warehousing operations.
- Naval material for which responsibility is not otherwise assigned.

E6 MARINE CORPS ORGANIZATION FOR RDT&E

MCO P5000.10, HQMC Order P5400.18

The Marine Corps has responsibility for the development of equipment intended for use by landing forces in amphibious operations. The two Marine Corps organizations primarily concerned with RDT&E matters are the Headquarters Marine Corps (HQMC) and the Marine Corps Development and Education Command (MCDEC) at Quantico, Virginia. In addition, individual personnel considered to comprise elements of the Marine Corps RDT&E organization are those assigned to other DOD R&D activities as Marine Corps Liaison Officers or Marine Corps Representatives, and those occupying Marine

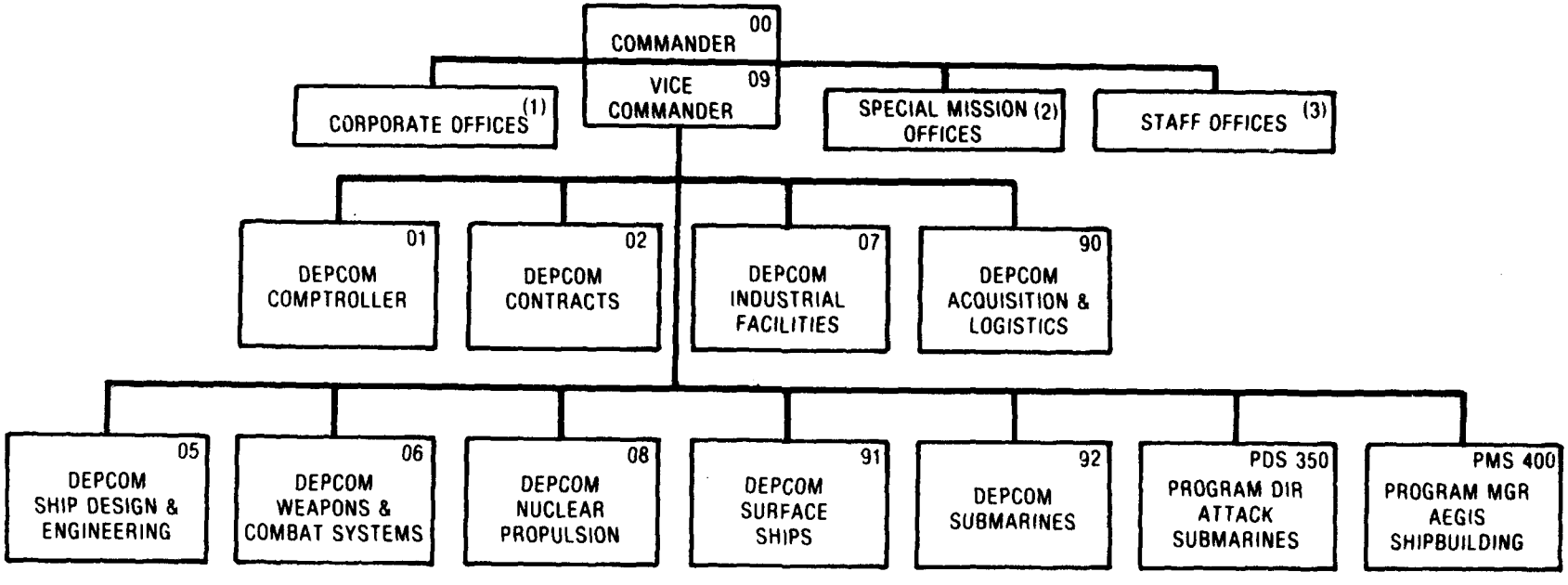

Figure E-9. Naval Sea Systems Command Headquarters

Corps-sponsored billets in the T/Os of these activities.

E6.1 HQMC Organization for RDT&E.

E6.1.1 Deputy Chief of Staff for Research, Development, and Studies (DC/S RD&S). The Deputy Chief of Staff for Research, Development and Studies directs the total Marine Corps RDT&E effort to support the acquisition of new systems. He is assisted by the general staff sections throughout the execution and coordination of the systems acquisition process within their areas of staff responsibility. In addition, the DC/S RD&S directs and coordinates an extensive studies program conducted by civilian contractors, in-house offices, and the other Services, to support the Marine Corps RDT&E efforts.

The DC/S RD&S functions as a special advisor to the ASN(R,E&S) for Marine Corps RDT&E matters. He is a principal of the Marine Corps Systems Acquisition Review Council (MSARC) and serves as the Executive Secretary. Within the Marine Corps the DC/S RD&S has overall responsibility for the review, coordination, and monitoring of all RDT&E activity, including planning, programming, and budgeting. Assistance in performing these functions, including technical management and executive of R&D programs, is provided by Acquisition Program Officers, and Development Coordinators in HQMC. Assistance is also provided by CG, MCDEC, as appropriate. The DC/S RD&S is also an acquisition program sponsor for selected systems acquisitions (involving RDT&E activity) which would not logically be a responsibility of other sponsors.

E6.1.1.1 Scientific Advisor. Serves as the principal consultant and advisor for scientific and technological matters to DC/S RD&S and to other Deputy Chiefs of Staff and Headquarters offices. His primary purpose is to provide scientific/technological judgment, guidance, background, and recommendations to ensure continuing and significant improvement in the effectiveness of Marine Corps systems and the attainment of a modern landing force capability as it is affected by research, development and studies. He provides policy and analytical guidance for the R&D and studies programs.

E6.1.1.2 Program and Budget Branch. Assists the DC/S RD&S in the coordination and supervision of planning, programming, and budgeting activities required in execution of the Marine Corps RDT&E program, except for those planning and programming activities assigned to the Studies Branch of the Office of the DC/S RD&S for coordination and supervision.

E6.1.1.3 Developments Branch. Assists and advises the DC/S RD&S in the formulation, coordination and execution of RDT&E projects.

E6.1.1.4 Studies Branch. Coordinates all major Marine Corps studies while monitoring the studies of the other U.S. government agencies, U.S. military services, and services of friendly nations.

E6.1.2 Deputy Chief of Staff for Aviation (DC/S Avn). The DC/S Avn is the program sponsor for all matters relating to aviation, including systems acquisition in assigned areas of cognizance. He is a principal member of the MSARC. The DC/S Avn is assisted in this respect by the Director of Marine Corps Reserve for reserve-aviation-related manpower.

E6.1.3 Deputy Chief of Staff for Manpower (DC/S Mpr). The DC/S Mpr is responsible for military (Marine and Navy) and civilian manpower required to support the Marine Corps, and for systems acquisitions in assigned areas of cognizance. He directs and supervises all aspects of manpower matters, including personnel research, manpower analysis, and the development of information systems.

E6.1.4 Director of Intelligence (DirIntel). The DirIntel Division is the program sponsor for all intelligence matters including systems acquisitions in assigned areas of cognizance. The DirIntel coordinates principally with the DC/S Plans, Policies and Operations, the DC/S Avn, and the DirC^4 on matters/programs affecting or impacting in areas of air/ground/C^2.

E6.1.5 Deputy Chief of Staff for Plans, Policies, and Operations (DC/S PPO). The DC/S PPO serves as a principal member of the MSARC, exercises primary cognizance in the achievement and improvement of operational

capabilities of ground combat systems, and acts as an acquisition sponsor for selected systems and equipment.

E6.1.6 Deputy Chief of Staff for Installations and Logistics (DC/S I&L). The DC/S I&L is program sponsor for all matters pertaining to installations and logistics support and for systems acquisition in assigned areas of cognizance. He serves as a principal member of the MSARC. The DC/S I&L is the principal source of assistance and support for acquisition program sponsors in the technical and logistics aspects of ground systems acquisition, including aviation ground support equipment. For all other aviation systems acquisitions, the DC/S I&L coordinates with the DC/S Avn on installations and logistics support matters.

E6.1.7 Deputy Chief of Staff for Requirements and Programs (DC/S R&P). The DC/S R&P is responsible for coordinating Headquarters Marine Corps actions to provide the overall program requirements of the Fleet Marine Force, the Supporting Establishment, and the Organized Marine Corps Reserve. He is a principal member of the MSARC and validates all requirements for capabilities in meeting Marine Corps objectives. He determines requirements and establishes priorities for research and development. He ensures consistency, continuity and compatibility of all approved requirements within available resources, and acts as the independent review agency for cost analysis for systems acquisition projects.

E6.1.8 Director, Command, Control Communications, and Computers (C^4) Division (DirC^4). The Director, C^4 Division provides for the planning, directing, and coordinating of staff activities on matters relating to command and control systems; is the program sponsor for Marine Corps telecommunications and automated data systems; and advises the CMC on JCS matters related to those activities. He is a principal member of the MSARC.

E6.2 Marine Corps Development and Educational Command (MCDEC).

E6.2.1 Commanding General, MCDEC (CG,MCDEC). CG,MCDEC 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, techniques and equipment used by landing forces.

Representative functions performed by CG,MCDEC in carrying out his responsibilities include: identifying required study areas and recommending and executing approved studies, as appropriate, in support of Marine Corps mid- and long-range planning; preparing, coordinating, and reviewing operational requirement documentation; monitoring the status and capabilities of equipment and system developments conducted by other Services and making recommendations concerning Marine Corps interest and participation therein; as a DON claimant on behalf of the Marine Corps, prepare and recommend annually a Marine Corps exploratory development program to be executed by the Chief of Naval Material; implement developmental efforts supported by Marine Corps RDT&E funds; implement policies, procedures, and requirements for development testing and evaluation (DT&E) of all systems to be acquired by the Marine Corps; provide direct assistance to the Marine Corps Operational Testing and Evaluation Activity (MCOTEA) and the Fleet Marine Force (FMF) in the planning, conduct, and reporting of operational test and evaluation (OT&E); and prepare and recommend annually a total program for Marine Corps RDT&E during the FYDP period, including recommended funding (see G4.1).

E6.2.2 Development Center, MCDEC. CG, MCDEC's Deputy for Development/ Director, Development Center has been assigned the responsibility for carrying out CG,MCDEC's RDT&E functions as listed above. The Development Center provides capabilities for R&D planning and programming and for developing new concepts, doctrines, tactics, techniques, and organizational structures, as well as continuing to test and evaluate new equipment.

E6.3 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.

E6.4 Fleet Marine Forces (FMF). The Fleet Marine Forces also figure prominently in the Marine Corps organization for RDT&E by providing a tailored vehicle for troop test and evaluation of material development in an operational environment.

E7 OFFICE OF NAVAL RESEARCH (ONR)

SECNAVINSTS 5430.20, 5430.67; ONRINST 5430.1, ONR Organization Manual

The Office of Naval Research (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 the preservation of national security.

E7.1 Chief of Naval Research (CNR). CNR heads the Office of Naval Research and is a principal advisor to ASN(R,E&S). CNR is appointed by the President by and with the advice and consent of the Senate. He is responsible to SECNAV through ASN(R,E&S).

E7.2 Functions of ONR

- Conduct research in augmentation of and conjunction with, the research and development conducted by other DON activities.
- Coordinate the Naval Research Program.
- Provide budgeting, accounting, and related reporting and data processing services required by ASN(R,E&S) for management and control of the RDT&E,N appropriation; and those services required by CNO, CMC, and CNM to fulfill their responsibilities in the planning, programming, and budgeting of the RDT&E,N appropriation.
- Supervise and control DON activities relating to patents, inventions, copyrights, etc.
- Make contracts and grants with educational institutions and nonprofit organizations for other DON activities.

E7.3 Organization. The organization of ONR is depicted in Figure E-10.

E8 NAVAL MEDICAL COMMAND (NAVMEDCOM)

NAVMEDCOMINSTS 5430.1, 5450.14

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.

E8.1 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 his 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; 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.

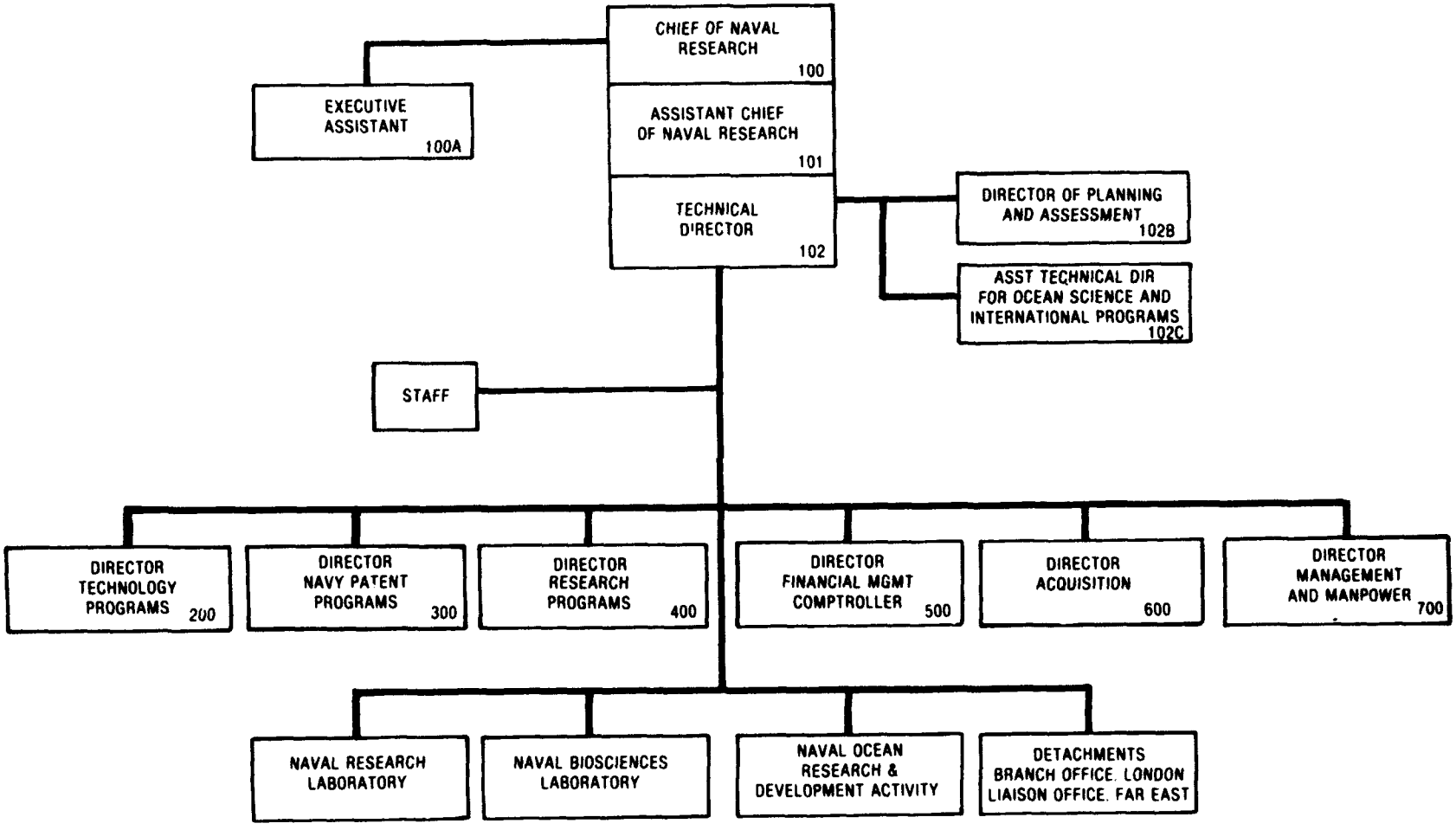

Figure E-10. Office of Naval Research

E9 COMMITTEES

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 Research and Engineering, advises the Secretary of Defense, through the Under Secretary for Research and Engineering, on scientific and technical matters of interest to the Department of Defense.

DODDIR 5129.22

E9.2 Defense Systems Acquisition Review Council (DSARC). The DSARC serves as an advisory body to the SECDEF on systems acquisition policy and on certain major defense system acquisition programs. It meets to provide recommendations to SECDEF on milestone decisions and on other occasions as directed by SECDEF or at the initiative of the Defense Acquisition Executive. The DSARC permanent members are the USDRE (Defense Acquisition Executive and chairman); the USD(P); DOT&E; ASD(MI&L); ASD (Comptroller); DPA&E; the Service Secretaries or their designees for major acquisition involving their Services; and the Chairman, JCS, or his designee.

The appropriate Deputy Under Secretaries of Defense; the Director, DIA; The Director, Defense Test and Evaluation (DDTE); the Director, Weapons Support Improvement Group (WSIG); and the Chairman, Cost Analysis Improvement Group (CAIG) are permanent advisors to the DSARC and participate in all reviews.

DODDIR 5000.1, DODINST 5000.2

E9.3 Naval Research Advisory Committee (NRAC). As the Navy Department's senior research advisory group, the Committee advises the Secretary of the Navy, the Chief of Naval Operations, and the Chief of Naval Research with respect to research and its utilization by the Navy, and on questions of policy on Navy-wide problems in science. It advises in particular 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 he 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 RDT&E, CNR/CND, DC/S (RD&S) USMC, and Deputy Assistant Secretaries of the Navy assigned to ASN(R,E&S).

SECNAVINST 5420.79

E9.4 Marine Corps Systems Acquisition Review Council (MSARC). The MSARC reviews major acquisition programs at decision milestones and at other times when required and provides recommendations to the Commandant. Membership consists of the Chief of Staff (chairman), the Deputy Chiefs of Staff, the Fiscal Director, Commanding General, MCDEC, the Director, C^4 Division, and the Director of Intelligence. DC/S RD&S is Executive Secretary. The Chairman may designate other principals to sit with the MSARC when the system under consideration involves matters in their areas of cognizance.

MCO P5000.10

E9.5 CNO Executive Board (CEB). The CEB's mission is to advise the CNO. The CEB considers decision alternatives on all major acquisition programs prior to review by SECNAV and SECDEF.

The CEB consists of four permanent members: CNO; VCNO; CNM; Director Navy Program Planning (OP-090), and one associate member, Commandant of the Marine Corps. Other key principals may be ad hoc members as directed to attend.

Special panels of the CEB include the SCIB and the ARC.

OPNAVINST 5420.2

E9.5.1 Ship Characteristics and Improvement Board (SCIB). The SCIB assists CNO in meeting his responsibilities pertaining to ship acquisition and conversion programs. SCIB tasks include the centralized formulation and coordination of the Navy's shipbuilding and conversion programs, the Fleet Modernization Program (FMP), and ship's characteristics determination for the active and reserve fleets. The SCIB is responsible for coordination of related planning, programming, budgeting, and support. The SCIB performs the functions of the ARC for ship acquisition programs.

Permanent members are DCNO (Surface Warfare) (chairman), Director Navy Program Planning, Director Naval Warfare, DCNO (Submarine Warfare), DCNO (Logistics), DCNO (Air Warfare), and Commander Naval Sea Systems Command. A small permanent staff under a senior line Captain provides support.

E9.5.2 Acquisition Review Committee (ARC). ARC functions include: (1) monitoring ACAT IIC acquisition programs; (2) reviewing all programs which will clearly lead to major systems acquisitions; and (3) reviewing key program documentation at program inititiation, full-scale development, and production milestone.

Permanent members are Director, Navy Program Planning (chairman); Director Naval Warfare; Director RDT&E; DCNO (Manpower, Personnel, and Training); and DCNO (Logistics). Ad Hoc members include the cognizant Resource and Mission Sponsor and NAVMAT representatives.

E9.6 Defense Resources Board (DRB). The primary role of the DRB is to help SECDEF manage the entire PPBS process. Acquisition-related DRB functions include review of high-priority programs on a regular basis and review of ACAT I programs prior to SECDEF's program initiation decision.

DRB members are DEPSECDEF (Chairman); Chairman, JCS; secretaries of the Army, Navy, and Air Force; USD (Policy); USD (Research and Engineering); ASD (Health Affairs); ASD (Manpower, Installations, and Logistics); ASD (Comptroller) (Executive Secretary); ASD (International Security Affairs); ASD (International Security Policy); General Counsel; ASD (Research and Technology); ASD (Development and Support); Director, Program Analysis and Evaluation; Director, Operational Test and Evaluation; and Associate Director OMB for National Security and International Affairs. The Service Chiefs are normally invited and usually attend meetings.

E9.7 Department of the Navy Systems Acquisition Review Council (DNSARC). The DNSARC consists of the Secretary of the Navy (chairman); the Under Secretary, the Assistant Secretaries; the General Counsel; the Director, Office of Program Appraisal; the CNO; and the Commandant of the Marine Corps. The DNSARC provides a formal mechanism by which the SECNAV reviews and appraises major weapon systems acquisition programs. It also provides a forum for review of major weapon systems acquisition presentations to be made to the Office of Secretary of Defense.

SECNAVINST 5000.1

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 to the Commander and the Chief of Naval Material. 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.

NAVMATINST 5000.19

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 this mission is precisely defined and mutually agreed to by the Board and the Director Research, Development, Test, and Evaluation (OP-098) acting for the Assistant Secretary of the Navy (Research, Engineering and Systems).

E9.10 Program Development Review Committee (PDRC). The PDRC is a flag-level group, chaired by OP-90, which reviews every step of the POM development process. The PDRC reviews each CPAM (see 3.3.5) prior to presentation to the CEB and acts as the review/decision forum for program assignments. Membership of the PDRC includes: OP-90 (Chairman), OP-96, OP-92D, OP-OOX, OP-009, OP-950, OP-09B, OP-093B, OP-094B, OP-098B, OP-09R, OP-12, OP-02B, OP-03B, OP-04B, OP-50, OP-60B, MAT-01, and representative of OPA, SECNAV, and the Marine Corps.

E9.11 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, CHNAVMAT, OP-090, OP-90, OPA, DC/S(R&P), ASN(RE&S), ASN(M&RA), and ASN(FM).

POM 87-1

APPENDIX F RESEARCH AND DEVELOPMENT LABORATORIES/CENTERS

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APPENDIX F
RESEARCH AND DEVELOPMENT LABORATORIES/CENTERS

The Navy's extensive in-house 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 Naval Ship R&D 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.

*DODINST 3201.3**

F1 THE ROLE OF THE IN-HOUSE RESEARCH AND DEVELOPMENT LABORATORIES/CENTERS

The present complex of the Navy's in-house laboratories employs over 15,000 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 billion dollars, of which 61% 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 men 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.

F2 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

*For additional information on subjects discussed in this Guide, consult the listed references. Titles, current editions, and promulgation dates of directives on which this edition is based can be found in the Master Reference List following the appendixes. When a DOD directive has been promulgated as an enclosure to a Navy directive, the promulgating directive is shown in parentheses following the DOD listing.

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 quick-reaction basis, often under tight security controls, for the solution of Navy and Marine Corps problems.

The Director of Navy Laboratories provides a focal point for the total Navy RDT&E laboratory complex at the department level.

SECNAVINSTS 3900.13, 3910.3

F2.1 Duties, Responsibilities, and Relationships of the Director of Navy Laboratories (DNL). The DNL serves in a staff and advisory capacity to the ASN(R,E&S) for matters relating to all Navy laboratories. Specifically, he advises ASN(R,E&S) on:

- The roles, missions, functions, and principal objectives and plans of the Navy laboratories.
- The magnitude and balance of the workloads of the laboratories, specifically, in the three broad categories of Technology Base; Systems Development, Test and Evaluation; and Fleet Support.
- The overall performance of Navy laboratories and recommends changes to improve the total RDT&E effort, laboratory utilization, and value to the Navy.
- Laboratory resource requirements.
- The selection, assignment, professional development, problems, and special needs of key laboratory personnel, both civilian and military.
- The manpower needs of the laboratories and the distribution of civilian personnel among these activities.
- The Military Construction Programs, equipment needs, and the Management and Support Program resource requirements (6.5 category) of the laboratories.
- The IR/IED programs and resource needs of the laboratories.
- The administration, organization, and management of the laboratories and on proposed major realignments, consolidations, closures, and the formation of new centers.
- The corporate long-range plan for the laboratories.
- The technical risks, problems, and views of the laboratories concerning major RDT&E programs which should be considered prior to and during decision processes associated with program acquisition milestones and the PPBS cycle.
- The performance appraisal criteria for senior military and civilian laboratory managers, e.g., Senior Executive Service performance objectives.

In addition, the DNL acts as Deputy Chief of Naval Material for Laboratories (DCNM(Labs)) in the Headquarters, Naval Material Command. In this position, he acts as the CNM's principal executive and line manager for the NMC laboratories.

SECNAVINST 3910.3

F3 LIST OF NAVY RESEARCH AND DEVELOPMENT LABORATORIES/ CENTERS

NAVMATINST 5450.27

F3.1 Laboratories Reporting to the Chief of Naval Research.

F3.1.1 Naval Research Laboratory (NRL).

Location: Washington, D.C. 20375
Telephone
Commercial: 202-767-3200
Autovon: X-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.

F3.1.2 Naval Ocean Research and Development Activity (NORDA).

Location: Bay St. Louis, Mississippi 39529
Telephone
Commercial: 601-688-4010
Autovon: X-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 this ocean environment on Navy systems and operations.

F3.2 R&D Centers Reporting to the Chief of Naval Material.

F3.2.1 Naval Air Development Center (NADC).

Location: Warminster, Pennsylvania 18974
Telephone
Commercial: 215-441-2000
Autovon: X-441-2000

Mission: To be the principal Navy RDT&E Center for naval aircraft systems, less aircraft-launched weapon systems.

F3.2.2 Naval Coastal Systems Center (NCSC).

Location: Panama City, Florida 32407
Telephone
Commercial: 904-234-4011
Autovon: X-436-4011

Mission: To be the principal Navy RDT&E Center for mine, torpedo, and sonar countermeasures, special warfare, amphibious warfare, diving, and other naval missions that take place primarily in the coastal regions.

F3.2.3 Naval Ocean Systems Center (NOSC).

Location: San Diego, California 92152
Telephone
Commercial: 619-225-6011
Autovon: X-933-1011

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.

F3.2.4 Navy Personnel Research and Development Center (NPRDC).

Location: San Diego, California 92152
Telephone
Commercial: 619-225-7106
Autovon: X-933-7106

Mission: To be the principal Navy RDT&E Center for manpower, personnel, education, training and human factors, and for providing technical support to the CNO in these areas.

F3.2.5 David W. Taylor Naval Ship Research and Development Center (DTNSRDC).

Location: Bethesda, Maryland 20084
Annapolis, Maryland 21402
Telephone
Commercial: 202-227-2828
Autovon: X-287-2828

Mission: To be the principal Navy RDT&E Center for naval vehicles and logistics, and to provide RDT&E support to the U.S. Maritime Administration and the maritime industry.

F3.2.6 Naval Surface Weapons Center (NSWC).

Location: Dahlgren, Virginia 22448
Telephone
Commercial: 703-663-8531
Autovon: X-249-1110

White Oak, Silver Spring, Maryland 20910
Telephone
Commercial: 202-394-1796
Autovon: X-290-1796

Mission: To be the principal Navy RDT&E Center for surface-ship weapons systems, ordnance, mines, and strategic systems support.

F3.2.7 Naval Underwater Systems Center (NUSC).

Location: Newport, Rhode Island 02840
New London, Connecticut 06320
Telephone
Commercial: 401-841-4816
Autovon: X-948-4816

Mission: To be the principal Navy RDT&E Center for submarine warfare and submarine weapon systems.

F3.2.8 Naval Weapons Center (NWC).

Location: China Lake, California 93555
Telephone
Commercial: 714-939-9011
Autovon: X-437-9011

Mission: To be the principal Navy RDT&E Center for air warfare systems (except antisubmarine warfare systems) and missile weapon systems, and the National range/facility for parachute test and evaluation.

F3.2.9 Naval Training Equipment Center (NTEC).

Location: Orlando, Florida 32813
Telephone
Commercial: 305-646-4436
Autovon: X-791-4436

Mission: To be the principal Navy Center for RDT&E, acquisition, and logistic support of training systems, to provide inter-service coordination and training systems support for the Army and Air Force, and to perform such other functions and tasks as directed by higher authority.

F3.3 R&D Activity Reporting to the Commander, Naval Air Systems Command.

F3.3.1 Naval Environmental Prediction Research Facility (NEPRF).

Location: Monterey, California 93940
Telephone
Commercial: 408-646-2837
Autovon: X-878-2837

Areas of Responsibility: Conduct research and development directed toward providing objective local, regional, and global meteorological analysis and prediction techniques; and provide planning, modeling, and evaluation services for determining the effect of changing meteorological conditions on naval weapon systems.

F3.4 R&D Activity Reporting to the Commander, Naval Electronic Systems Command.

F3.4.1 Navy Space Systems Activity (NSSA).

Location: PO Box 92960
Los Angeles, California 90009
Worldway Postal Center
Telephone
Commercial: 213-643-1824
Autovon: X-833-1824

Areas of Responsibility: Perform engineering and management for the development of assigned space systems.

F3.5 R&D Activity Reporting to the Commander, Naval Facilities Engineering Command.

F3.5.1 Naval Civil Engineering Laboratory (NCEL).

Location: Port Hueneme, California 93043
Telephone
Commercial: 805-982-4528
Autovon: X-360-4528

Areas of Responsibility: To be the principal Navy RDT&E Laboratory for shore facilities, fixed-surface and subsurface ocean facilities, and for the Navy and Marine Corps construction forces.

F3.6 R&D Activity Reporting to the Commander, Naval Sea Systems Command.

F3.6.1 Naval Explosive Ordnance Disposal Technology Center (NEODTC).

Location: Indian Head, Maryland 20640
Telephone
Commercial: 301-743-4225/4330
Autovon: X-364-4225/4330

Mission: To be the principal Center for research and development of explosive ordnance disposal (EOD) countermeasures and related equipment as necessary to support the Single Manager assignment to the Department of the Navy for joint service EOD Technology and Training.

F3.7 R&D Activity Reporting to the Commander, Naval Supply Systems Command.

F3.7.1 Navy Clothing and Textile Research Facility (NCTRF).

Location: 21 Strathmore Road
Natick, Massachusetts 01760
Telephone
Autovon: X-256-4172

Mission: To conduct research, development, test and evaluation, and provide engineering support in clothing, textiles, and related fields associated with Service clothing and environmental protective clothing.

F4 GOVERNMENT-OWNED CONTRACTOR-OPERATED LABORATORIES AND FEDERAL CONTRACT RESEARCH CENTER

The capabilities of the Navy in-house research and development laboratories are supplemented by government-owned contractor-operated laboratories (GOCO) and a Federal Contract Research Center (FCRC).

F4.1 Activities under ONR Contract.

F4.1.1 Marine Physical Laboratory, Scripps Institution of Oceanography.

Location: San Diego, California 92152
Telephone
Commercial: 619-225-7259
Autovon: X-933-7259

Contractor: Scripps Institution of Oceanography, University of California.

Mission: Generation of knowledge about the ocean and its boundaries and application of this knowledge to the solution of Navy undersea problems.

F4.1.2 Naval Biosciences Laboratory.

Location: Naval Supply Center
Oakland, California 94625
Telephone
Commercial: 415-466-5955
Autovon: X-836-5955

Contractor: University of California

Mission: To perform bioscience research and development responsive to the needs of the DON and to provide integrated bioscience research activity from Research (6.1) through Advanced Development (6.3).

F4.1.3 Center for Naval Analyses (CNA).

Location: 2000 N. Beauregard St.
Alexandria, Virginia 22311
Telephone
Commercial: 703-998-3500
Autovon: X-225-9241

F4.1.3

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.

F5 UNIVERSITY LABORATORIES WITH PRIMARY NAVY RDT&E MISSIONS

F5.1 Applied Research Laboratories, Pennsylvania State University.

Location: PO Box 30
State College, Penn. 16801
Telephone
Commercial: 814-865-6343

Contractor: Research Laboratories, Pennsylvania State University

Mission: The application of knowledge about the ocean, its boundaries, and the surrounding media to the solution of Navy problems with major emphasis in the area of undersea weapons guidance and control systems, torpedoes, submarines and ships.

F5.2 Applied Research Laboratories, The University of Texas at Austin.

Location: PO Box 8029
Austin, Texas
Telephone
Commercial: 512-835-3200

Contractor: Applied Research Laboratories, The University of Texas at Austin

Mission: The application of knowledge about the ocean, its boundaries and the surrounding media to the solution of Navy problems in surface, subsurface, atmospheric and tropospheric areas.

F5.3 Applied Physics Laboratories, The University of Washington.

Location: 1013 N 40th St.
Seattle, Washington 98105
Telephone
Commercial: 206-543-1310

Contractor: Applied Physics Laboratories, The University of Washington

Mission: The application of knowledge about the ocean and its boundaries and the surrounding media to the solution of Navy problems with major emphasis on undersea weaponry.

F5.4 Applied Physics Laboratory, Johns Hopkins University.

Location: Laurel Maryland 20707
Telephone
Commercial: 301-792-7800
FTS: X-920-3370

Mission: To conduct research programs and investigations, engineering analyses, experiments, technical evaluations, and collection of information in fields of interest to the Navy and to other government agencies.

F5.5 Systems Research Center, Virginia Polytechnic Institute and State University

Location: Blacksburg, Virginia 24061
Telephone
Commercial: 703-961-6122

Mission: To conduct research and development for computing support systems of interest to the Navy and to other government agencies.

F6 MEDICAL RESEARCH ACTIVITIES

The following activities report to the Commanding Officer, Naval Medical Research and Development Command.

F6.1 Naval Health Research Center (NHRC).

Location: PO Box 85122
San Diego, California 92138
Telephone
Commercial: 619-225-2911
Autovon: X-933-2911

Areas of Responsibility: Conduct research and development on the medical and psychological aspects of health and performance of naval service personnel.

F6.2 Naval Medical Research Institute (NMRI).

Location: Naval Medical Command, National Capital Region, Bethesda, Maryland 20814
Telephone
Commercial: 202-295-0021
Autovon: X-295-0021

Detachments at Dayton, Ohio and Lima, Peru.

Areas of Responsibility: Conduct basic and applied research and development concerned with the health, safety, and efficiency of naval personnel.

F6.3 Naval Submarine Medical Research Laboratory (NSMRL).

Location: Naval Submarine Base
Groton, Connecticut 06349
Telephone
Commercial: 203-449-3264
Autovon: X-241-3264

Areas of Responsibility: Conduct medical research and development on problems peculiar to shipboard, submarine, and diving medicine.

F6.4 Naval Medical Research Unit No. 2.

Location: Manila, Republic of the Philippines
Telephone
88-96-11 (O'Sea Opr)

Detachment in Djakarta, Indonesia
Telephone
41-45-07 (O'Sea Opr)
Mail Add.: APO San Francisco 96528

Areas of Responsibility: Perform medical research on diseases of military importance that are endemic and epidemic in the Far East.

F6.5 Naval Medical Research Unit No. 3.

Location: Cairo, Egypt
Telephone
820-727 (O'Sea Opr)
Mail Add.: FPO New York 09527

Areas of Responsibility: Perform medical research on diseases of military importance that are endemic and epidemic in the Middle East.

F6.6 Naval Aerospace Medical Research Laboratory (NAMRL).

Location: Naval Air Station
Pensacola, Florida 32508
Telephone
Commercial: 904-452-3286
Autovon: X-922-3286

Areas of Responsibility: Conduct research and development, test and evaluation in aerospace medicine and related scientific areas applicable to aerospace systems.

F6.7 Naval Dental Research Institute (NDRI).

Location: Naval Base
Great Lakes, Illinois 60088
Telephone
Commercial: 312-688-4678
Autovon: X-792-4678

Areas of Responsibility: Conduct research, development, test and evaluation in dental and allied sciences, with particular emphasis on problems of dental and oral health in Navy and Marine Corps population and on problems of fleet and field dentistry.

F6.8 Naval Biodynamics Laboratory (NBDL).

Location: PO Box 29407
New Orleans, Louisiana 70189
Telephone
Commercial: 504-255-4870
Autovon: X-485-2294

Areas of Responsibility: 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; develop methods to protect personnel from such forces.

SELECTED REFERENCES ON RESEARCH AND DEVELOPMENT LABORATORIES/CENTERS

DODDIR 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).

DODDIR 3201.3, "DOD Research and Development Laboratories," amplifies long-term goals and objectives of DOD research and development (R&D) laboratories.

SECNAVINST 3900.13, "Management of Navy Research and Development Laboratories," establishes policies and procedures for the management and operation of Navy in-house laboratories.

SECNAVINST 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.

NAVMATINST 5430.60, *NAVMAT Organization Manual.*

NAVMATINST 5450.27, "CNM Commanded Laboratories and Centers; mission and functions of," promulgates the functions to be performed by the research and development centers under the command of the Chief of Naval Material.

NAVMATINST 5450.3, "Delegation of command for shore activities assigned to the NMC."

NAVMAT P-3999, Navy Technical Facility Register (Official Use Only), a comprehensive compendium of information on Navy RDT&E activities. It constitutes a centralized source of information on the type and capabilities of major equipment and facilities located at the activities.

NAVCOMPTINST 7044.5, "DOD In-House RDT&E Annual Activities Report," instructions for preparation of report.

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 Chief of Research and Development, Department of the Army. In addition to the missions, it provides data on finances, manpower, facilities and major programs for all designated DOD RDT&E field activities.

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 G TEST AND EVALUATION

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APPENDIX G
TEST AND EVALUATION

This appendix provides information amplifying Chapter 7, "Test and Evaluation."

G1 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."

G2 T&E RESPONSIBILITIES OF OFFICIALS

G2.1 Director, Defense Test and Evaluation (DDTE). The DDTE has principal staff responsibility within OSD for test and evaluation matters. He provides for the resolution of Service T&E management problems and for coordination of T&E instructions to the Services. The DDTE responsibilities include:

1. Reviewing test and evaluation policy and procedures applicable to the Department of Defense as a whole and recommending changes he believes appropriate directly to the Secretary of Defense.

2. Monitoring the test and evaluation planned and conducted by the DOD components for major acquisition programs and for such other programs as he believes necessary.

3. Assisting in the preparation and/or review of the TEMP, and the Test and Evaluation Sections of DCPs.

4. For major programs under DSARC review, reporting to the DSARC and the Worldwide Military Command and Control System Council, as appropriate, and directly to the Secretary of Defense for such programs, at each major milestone decision point his assessment as to the results and adequacy of the testing accomplished to date and the adequacy of testing planned for the future to support the recommendations of the DSARC.

5. For major programs under component SSARC review, participating in the OSD review of SSARC reports to the Secretary of Defense and reporting to the Secretary of Defense his independent assessment for major programs under DSARC review.

6. Monitoring closely such joint testing as is accomplished by the DOD components in connection with their planned acquisition of specific systems. Additionally, initiating and sponsoring the accomplishment of such additional developmental or technically oriented joint testing as is necessary, with specific delegation to an appropriate component (or components) of all practical aspects of the joint test.

7. Coordinating and reviewing the test and evaluation of foreign systems for possible DOD or NATO-wide use.

8. Fulfilling OSD responsibilities for the Major Range and Test Facility Base (MRTFB).

9. Monitoring, only to the extent required to determine the applicability of results to weapon system acquisition or modification, that test and evaluation:

a. Directed by the Joint Chiefs of Staff which relates to the Single Integrated Operational Plan (SIOP) as it affects system technical characteristics.

b. Conducted primarily for development or investigation of organizational or doctrinal concepts that affect system technical characteristics.

To accomplish these duties, statements of critical issues and test objectives, test plans, and test results will be made available to the DDTE as early as developed for such major or other programs as he may request.

*DODDIR 5000.3**

G2.2 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:

1. Prescribing policies, procedures, and standards for OT&E.

2. Providing guidance for conduct of OT&E in general and specific OT&E for major systems.

3. Monitoring and reviewing OT&E to ensure adherence to approved policies and standards.

4. Coordinating JOT&E programs with special emphasis on obtaining information pertinent to operational doctrine, tactics, and procedures.

5. Taking actions to ensure that OT&E for major programs properly evaluates the operational effectiveness and suitability of systems.

6. Reviewing and making recommendations to SECDEF on all budgetary and financial matters relating to OT&E including facilities and equipment.

7. 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

*For additional information on subjects discussed in this Guide, consult the listed references. Titles, current editions, and promulgation dates of directives on which this edition is based can be found in the Master Reference List following the appendixes. When a DOD directive has been promulgated as an enclosure to a Navy directive, the promulgating directive is shown in parentheses following the DOD listing.

G2.3 Director RDT&E (OP-098). The Director, RDT&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

G2.3.1 Test and Evaluation Division (OP-983). The Test and Evaluation Division implements the responsibilities of the Director, RDT&E with respect to cognizance over planning, conduct, and reporting of all air, surface, and undersea/strategic test and evaluation. The Division:

1. Acts as the sole OPNAV/NAVMAT point of contact with the Director, Defense Test and Evaluation (DDTE) in the Office of the USDRE and forwards to the DDTE all appropriate Navy T&E documents and information.

2. Acts as Navy point of contact for all mult-service T&E.

3. Reviews operational requirements and development proposals to ensure adequate provision for T&E facilities/resources will be made.

4. Reviews Navy Decision Coodinating Papers, Decision Coordinating Papers, and changes thereto for adequacy and accuracy; and exercises Navy policy and control over T&E sections thereof.

5. Reviews Test and Evaluation Master Plans (TEMPs) to ensure compliance with T&E policies.

6. 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.

7. Exercises for the Director, RDT&E sponsorship over all range and target matters including acting as program sponsor for the Navy elements of the Major Range and Test Facility Base and the Antiship Missile Defense Test Range Program.

8. Schedules all RDT&E fleet support.

G2.4 DCNM (Acquisition) (MAT-08). The Deputy Chief of Naval Material (Acquisition) (MAT-08) is responsible for implementation of the responsibilities of the Chief of Naval Material with respect to cognizance over planning, conduct, and reporting of all air, surface, and undersea/strategic test and evaluation. DCNM(A) is supported in the accomplishment of these responsibilities by a small staff in MAT-08P2.

NAVMATINST 5430.60, NAVMAT Organization Manual

G2.4.1 Special Assistant for Range Matters (AIR-06). Within the responsibilities of the Chief of Naval Material, the Special Assistant for Range Matters provides policy guidance and direction relative to the development, operation, and support of naval ranges and targets (see 7.2.6).

G3 T&E ACTIVITIES REPORTING TO CNO

G3.1 Board of Inspection and Survey.

OPNAVINST 5420.70

G3.1.1 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 covers 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 semi-permanent sub-boards 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.

G3.1.2 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.

G3.2 Operational Test and Evaluation Force (OPTEVFOR).

OPNAVINST 5440.47

G3.2.1 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 Systems Acquisition Review Council (DSARC) 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, suit- ability, 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.

G3.2.2 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 COMOPTEVFOR 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 COMOPTEVFOR-PAC 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.

G3.2.3 OPTEVFOR subordinate commands. The Operational Test and Evaluation Force comprises the following subordinate commands:

G3.2.3.1 Air Test and Evaluation Squadron One (VX-1).

Location:
Naval Air Station
Patuxent River, Maryland 20670
Tel: Comm. (301) 863-3607
Auto. X-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 by aircraft assigned to the squadron, including land planes, carrier types, fixed-wing types, and rotary-wing types.

G3.2.3.2. Air Test and Evaluation Squadron Four (VX-4).

Location:
Point Mugu, California 93042
Tel: Comm. (809) 982-7518
Auto. X-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.

G3.2.3.3. Air Test and Evaluation Squadron Five (VX-5).

Location:
Naval Weapons Center
China Lake, California 93555
Tel: Comm. (714) 939-5274
Auto. X-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.

G3.2.3.4 Sunnyvale Test and Evaluation Detachment.

Location:
Naval Air Station
Moffet Field, California 94034
Tel: Comm. (408) 745-3110
Auto. X-462-0111

The function of the Sunnyvale Test and Evaluation Detachment is to develop and test new tactics, operating procedures, and techniques for command support capabilities by conducting carefully designed and recorded operational

experiments. The objective is to increase the timely flow of information beyond the present capabilities of our air, surface, and subsurface collection and processing assets; also, to improve our ship and shore-based processing assets to provide a timely flow of up-to-date tactical, logistical, and environmental data to commanders.

G3.2.3.5 Fleet Development Groups. The Commander, Operational Test and Evaluation Force supervises and directs the prosecution of CNO-approved RDT&E projects assigned to such Fleet development groups as are, or may be, established. In these cases the appropriate Fleet Commander in Chief directs commanders of these groups to report to the Commander, Operational Test and Evaluation Force for additional duty in connection with the prosecution of projects so assigned.

G3.3 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.

G4 T&E ACTIVITIES REPORTING TO COMMANDANT MARINE CORPS

G4.1 Marine Corps Development and Education Command (MCDEC).

Location: Quantico, Virginia 22134
Tel: Comm. (703) 640-3141
Auto. X-278-3141

Detachments: Marine Corps Development Center (MCDC), Quantico, Virginia.

Mission: To develop, in coordination with agencies and representatives of other Services, the doctrine, tactics, techniques, and equipment employed by landing forces in amphibious operations. [MCDEC's mission also includes responsibilities in support of planning, education, and training.]

MCDEC's functions include broad responsibilities for Development Testing and Evaluation (DT&E) of Marine Corps systems and providing assistance to the Marine Corps Operational Testing and Evaluation Activity (MCOTEA) (see E7.2.1 and G4.2).

G4.2 Marine Corps Operational Testing and Evaluation Activity (MCOTEA).

Location: Quantico, Virginia
Tel: Comm. (703) 640-3141
Auto: X-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 non-major systems, and to perform such other functions as may be directed by the Commandant of the Marine Corps.

MCO 3960.2

G5 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 F 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.

NAVMATINST 5450.27; Navy Technical Facility Register (NAVMAT P-3999) (Official Use Only)

G5.1 Atlantic Undersea Test and Evaluation Center (AUTEC).

Parent Laboratory: Naval Underwater Systems Center (F3.2.7)

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 antisubmarine warfare and undersea research and development programs and of antisubmarine warfare fleet assessment and operational readiness.

G5.2 Naval Weapons Center Ranges.

Parent Laboratory: Naval Weapons Center (F3.2.8)

Location: China Lake, California

Mission: To conduct test and evaluation of air warfare systems (except antisubmarine warfare systems) and missile weapon systems.

G5.3 Naval Surface Weapons Center Ranges.

Parent Laboratory: Naval Surface Weapons Center (F3.2.6)

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.

G6 T&E FIELD ACTIVITIES REPORTING TO COMMANDER NAVAL AIR SYSTEMS COMMAND

G6.1 Naval Air Engineering Center.

Location: Lakehurst, New Jersey 08733
Tel: Comm. (201) 323-1110
Auto: X-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.

Location: PO Box 7176
Trenton, New Jersey 08628
Tel: Comm. (609) 896-5600
Auto: X-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.

G6.3 Naval Air Test Center (NATC).

Location: Patuxent River, Maryland 20670
Tel: Comm. (301) 863-3000
Auto: X-356-0111

Mission: To perform development test and evaluation of naval aircraft as total integrated weapon systems, including airframe as platform, and associated weapon systems, subsystems, and components.

G6.4 Pacific Missile Test Center (PMTC).

Location: Point Mugu, California 93042
Tel: Comm. (805) 982-7851
Auto: X-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.

G6.5 Naval Weapons Evaluation Facility.

Location: Kirtland AFB
Albuquerque, New Mexico 87117
Tel: Comm. (505) 844-0011
Auto: X-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.

G7 T&E FIELD ACTIVITIES REPORTING TO COMMANDER NAVAL SEA SYSTEMS COMMAND

G7.1 Naval Ordnance Missile Test Station.

Location: White Sands Missile Range, New Mexico 88002
Tel: Comm. (505) 678-2101
Auto: X-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.

G7.2 Naval Ship Weapons Systems Engineering Station (NSWSES).

Location: Port Hueneme, California 93043
Tel: Comm. (805) 982-4711
Auto: X-360-4711

Mission: To provide engineering, test and evaluation, logistics, systems assurance, and program management of assigned combat systems, weapon systems, weapons, support systems, equipments and components, and other functions as directed by the Commander, Naval Sea Systems Command.

SELECTED REFERENCES ON TEST AND EVALUATION

DODIR 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.

NAVMATINST 3960.6, "Test and Evaluation," sets forth policies and procedures for test and evaluation within NAVMAT.

NAVMATINST 5450.27, "CNM-Commanded Laboratories and Centers; missions and functions of," promulgates missions and functions of laboratories and centers under the command of the Chief of Naval Material.

APPENDIX J
NAVY SYSTEMS ACQUISITION PROCESS OUTLINE

The following pages provide, in the form of flow charts and facing-page descriptive paragraphs (step statements), an overview of the major steps in the DON's process for acquisition of systems. Variations in the process for each acquisition category are described. This process outline summarizes information presented in Section 2.5 of this Guide.

The first 9 steps, presented in the first 2 flow charts, cover the program initiation process. The remaining steps cover the process for milestone decisions.

The flow charts and associated step statements identify officials and special groups, planning and control documents, and the review and approval process. Sources of additional information in this Guide are referenced within the step statements.

Governing directives and other sources of in-depth information are identified in "Selected References" at the end of this Appendix.

When appropriate, a "NOTE" is added to the end of a paragraph to highlight options for the action described.

The flow charts and basic step statements were originally prepared for publication in the *Navy Program Manager's Guide* (NAVMAT P-9494) which is available from CO, NAVPUBFORMCEN, 5801 Tabor Ave., Philadelphia, PA 19120. Inquiries concerning NAVMAT P-9494 should be addressed to Chief of Naval Material (Attn. MAT-08PB).

ACQUISITION PROCESS OUTLINE

PROGRAM INITIATION

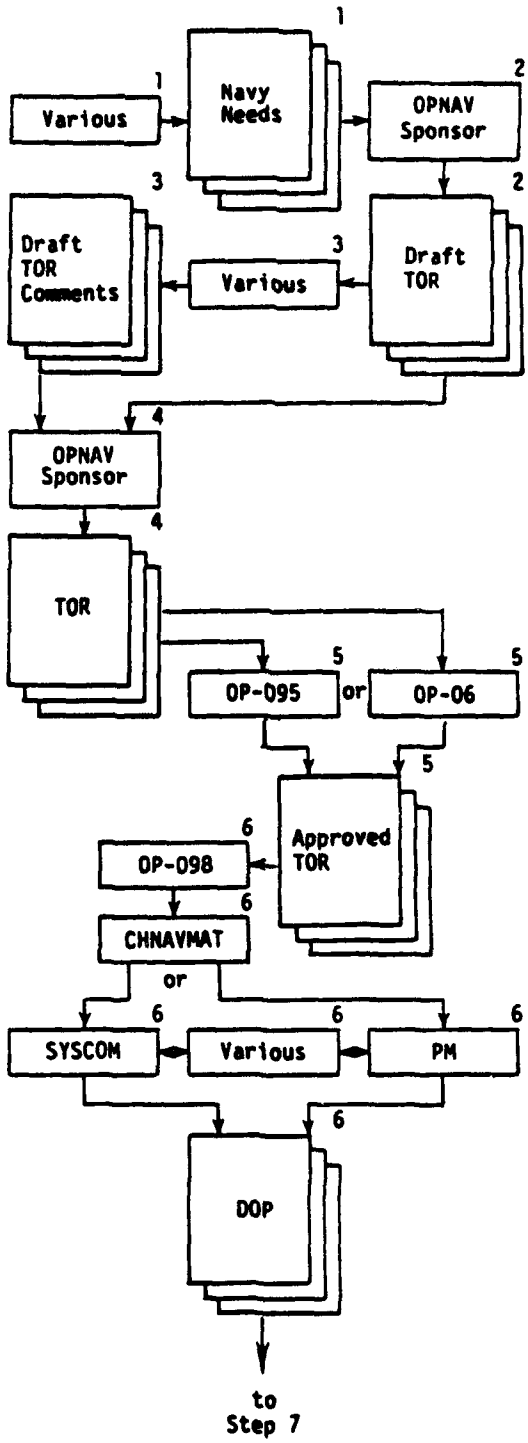

Figure J-1A. Steps 1-6 of Systems Acquisition Process

1. Inputs for Navy needs may be submitted to Office of the Chief of Naval Operations (OPNAV) sponsors by Deputy Chiefs of Naval Operations/Directors of Major Staff Offices (DCNOs/DMSOs), Fleet Commanders in Chief (CINCs) or others.

2. When the need for a new system is perceived and is believed to be affordable, a draft Tentative Operational Requirement (TOR) (see 2.5.3.1) is originated by the OPNAV sponsor.

3. The draft TOR is forwarded for comment to Fleet CINCs, selected offices within OPNAV, Commander, Operational Test and Evaluation Force (COMOPTEVFOR) and other as as appropriate.

4. Based on the comments received, the OPNAV sponsor revises the draft TOR as necessary.

5. The TOR is submitted to the Office of Naval Warfare (OP-095) for review and approval. TORs for strategic nuclear systems are submitted to the DCNO (Plans, Policy and Operations) (OP-06) for approval.

NOTE: TORs may be issued at any time in the annual cycle. A rule of thumb, for planning purposes, is that the TOR should be issued about a year in advance of the Program Objectives Memorandum (POM) (see 3.3.10) submission which will contain the initial funding.

6. Once approved by OP-095, the TOR is promulgated by the Office of the Director, Research, Development, Test and Evaluation (OP-098) and forwarded to the Chief of Naval Material (CHNAVMAT). CHNAVMAT in turn assigns it to the appropriate Systems Command (SYSCOM) commander or CHNAVMAT-designated program manager (PM). The SYSCOM commander or PM, on receipt of the TOR, explores the options adequately, interfacing with Navy laboratories, industry and COMOPTEVFOR as appropriate, to produce a Development Options Paper (DOP) (see 2.5.3.2) which describes a range of possible systems covering a spectrum of capabilities.

ACQUISITION PROCESS OUTLINE

PROGRAM INITIATION

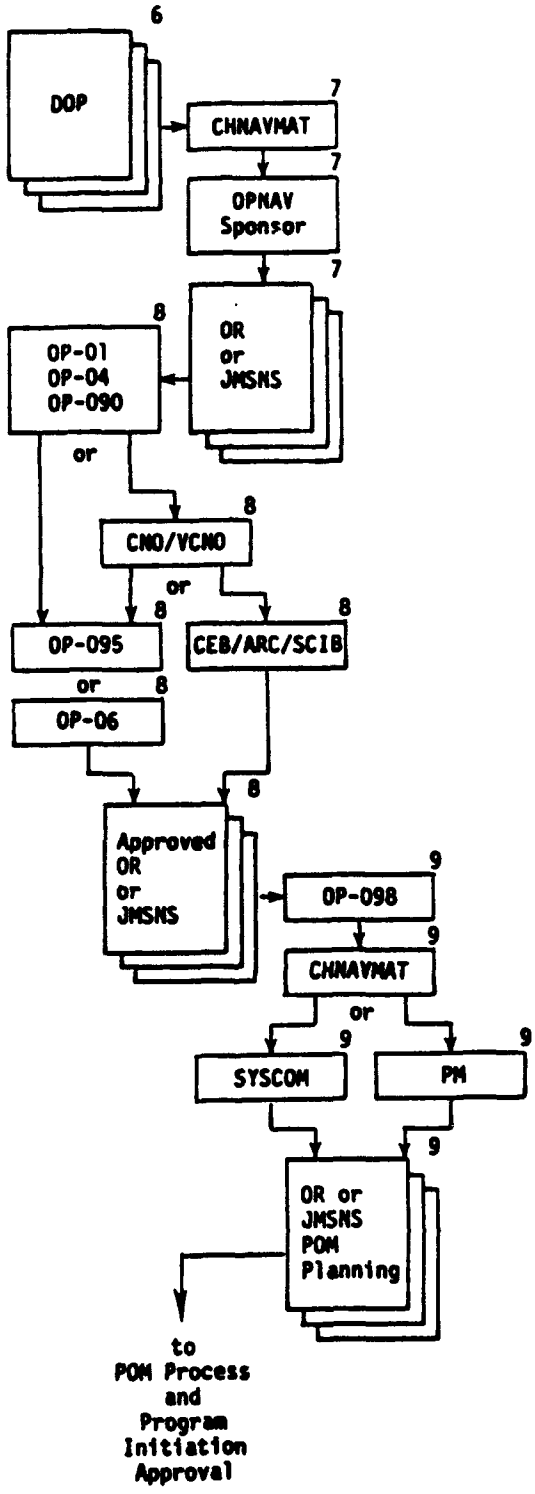

Figure J-1B. Steps 7-9 of Systems Acquisition Process

7. The DOP is transmitted to the OPNAV sponsor via CHNAVMAT with copies to selected OPNAV offices, COMOPTEVFOR and others as appropriate. The OPNAV sponsor selects the alternative which best matches the desired capabilities with affordability considerations. Based on this selection the OPNAV sponsor originates an Operational Requirement (OR) (see 2.5.3.3) defining the major characteristics of the selected system. For potential DOD major programs (ACAT I), a Justification for a Major System New Start (JMSNS) (see 2.5.3.5) is prepared in lieu of an OR.

8. The OR/JMSNS is routed, via DCNO (Manpower, Personnel and Training) (OP-01), DCNO (Logistics) (OP-04) and the Plans and Programs Office (OP-090), to OP-095 for review and approval. High-cost or controversial programs must be concurred in by Chief of Naval Operations/Vice Chief of Naval Operations (CNO/VCNO) prior to approval of the OR/JMSNS. OP-090 decides whether this approval is accomplished by the CNO Executive Board/Acquisition Review Committee/Ship Characteristics Improvement Board (CEB/ARC/SCIB) (see E9.5) or directly by OP-095. For strategic nuclear systems, the OR/JMSNS is reviewed and approved by OP-06.

9. Once approved, the OR/JMSNS is promulgated by OP-098 to CHNAVMAT with copies to all appropriate commands and offices. CHNAVMAT assigns the OR/JMSNS to the appropriate SYSCOM commander or CHNAVMAT designated PM who will initiate planning for the program described in the OR/JMSNS.

NOTE: ORs/JMSNSs may be issued at any time. However, if a new start is to be included in the POM submission in May, the OR/JMSNS must be promulgated by the preceding 1 February. This will allow about two months for OPNAV and Secretary of the Navy (SECNAV) review of the requirement and the proposed program prior to the final POM decision on funding.

NOTE: When a Navy POM with a JMSNS for a new major program is submitted to the SECDEF for approval, the SECDEF denotes his approval in the Program Decision Memorandum (PDM) (see 3.3.12). When a program represented by a JMSNS is modified by the SECDEF, the changes are documented in a SECDEF Decision Memorandum (SDDM) (see 2.5.7.1).

NOTE: If, subsequent to approval of an OR/JMSNS, the resulting program is not funded in the first or second year of the next POM, the OR/JMSNS is canceled by OP-098.

ACQUISITION PROCESS OUTLINE

MILESTONES I, II & III

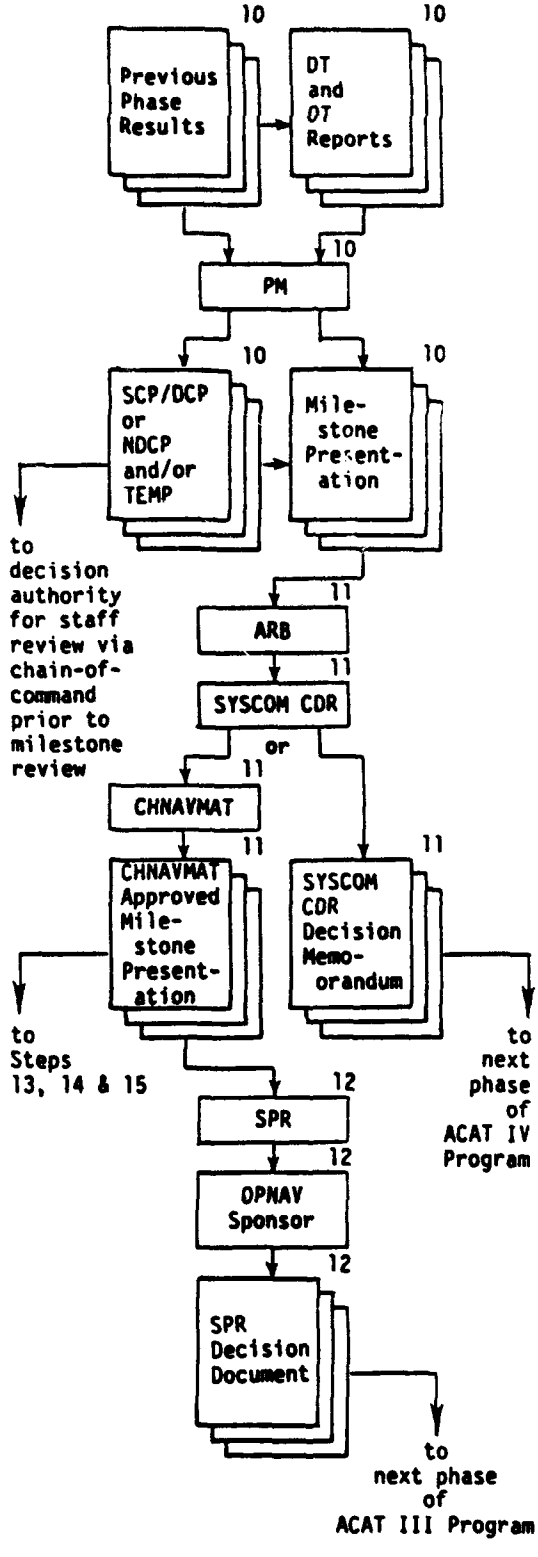

Figure J-1C. Steps 10-12 of Systems Acquisition Process

10. Once a program has made sufficient progress to allow it to enter into the next phase of acquisition and the development and operational test reports are available, the PM prepares or revises the necessary milestone decision review documents. For ACAT I programs these are a System Concept Paper (SCP) (see 2.5.5.1) and Test and Evaluation Master Plan (TEMP) (see 7.5.3), for Milestone I, or a Decision Coordinating Paper (DCP) (see 2.5.5.2) and TEMP for Milestones II and III. For an ACAT IIS and ACAT IIC, the decision documents are a Navy Decision Coordinating Paper (NDCP) (see 2.5.5.4) and TEMP for all milestones. For ACAT III and ACAT IV programs, the decision document, for all milestones, is the TEMP. In addition all program require the preparation of an Approval for Production action sheet for the Milestone III review. Based on these documents the PM prepares his Milestone Review Presentation. The SCP/DCP/NDCP/TEMP are forwarded by the PM, through the chain-of-command, to the approipriate decision authority level for staff review/recommendations prior to the milestone decision review.

NOTE: For ACAT I programs, at Milestones II and III, SECDEF may require some elements of the Integrated Program Summary (IPS) (see 2.5.5.3) as backup for the information contained in the DCP.

NOTE: ACAT III and ACAT IV programs do not normally have a Milestone I. However, a TEMP is required at the approximate time of Milestone I (near the beginning of the first fiscal year containing program funding).

11. The PM gives his Milestone Review Presentation to the SYSCOM Acquisition Review Board (ARB) (see 2.5.6.6). If the ARB is in agreement that the program is ready to enter the next phase, it so recommends to the CHNAVMAT. For ACAT IV programs, Systems Command Commander (SYSCOM CDR) approval of such an ARB recommendation and the documentation of that decision in a SYSCOM CDR decision memorandum provides the PM with the necessary go-ahead to proceed with the next acquisition phase.

NOTE: For ACAT IVT programs, if COMOPTEVFOR and the SYSCOM disagree, CHNAVMAT is the decision maker.

12. For ACAT III programs, after CHNAVMAT approval, the PM's Milestone Review Presentation is forwarded to the OPNAV sponsor who convenes a Sponsor's Program Review (SPR) (see 2.5.6.5). At the conclusion of the SPR, the OPNAV sponsor drafts the SPR decision document (see 2.5.7.3). After review of the draft by OP-090, OP-098 and OP-04, the SPR decision document is approved and promulgated by the OPNAV sponsor. The approved SPR decision document provides the necessary authority for the PM to proceed with the next phase.

NOTE: If there are significant disagreements as to what the recommendation should be, they are resolved by OP-090.

ACQUISITION PROCESS OUTLINE

MILESTONES I, II & III

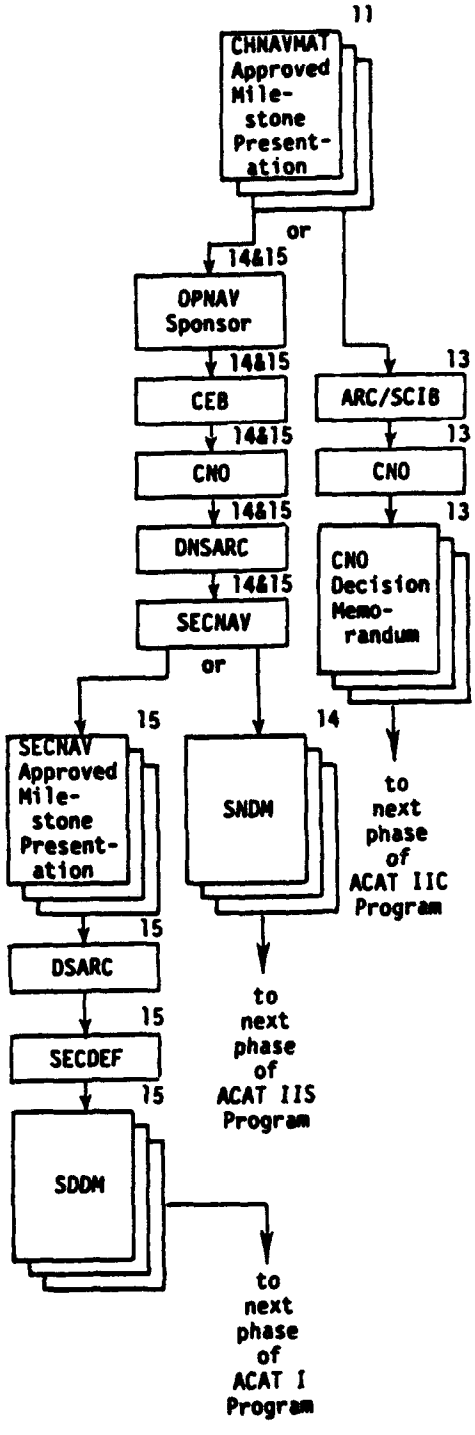

Figure J-1D. Steps 13-15 of Systems Acquisition Process

13. For ACAT IIC programs, after CHNAVMAT approval, the PM's Milestone Review Presentation is forwarded to the OPNAV Sponsor who submits it to the ARC or SCIB for review and recommendations. The ARC or SCIB recommendations are submitted to the CNO for review and approval. A favorable recommendation to and approval by the CNO documented in a CNO decision memorandum provides, for ACAT IIC programs, the PM with the authority to enter the next phase of the acquisition process.

14. For ACAT IIS programs, after CHNAVMAT approval of the PM's Milestone Review Presentation, the Presentation is given to the CEB and, CNO approval, is given to the Department of the Navy Systems Acquisition Review Council (DNSARC) (see 2.5.6.3). The DNSARC recommendations are submitted to the SECNAV for review and approval. A favorable recommendation to and approval by the SECNAV, documented in a SECNAV decision memorandum (SNDM) (see 2.5.7.2) provides, for ACAT IIS programs, the PM with the authority to enter the next phase of the acquisition process.

15. For ACAT I programs, the CHNAVMAT, CNO and SECNAV approved PM's Milestone Review Presentation is submitted to the Defense Systems Acquisition Review Council (DSARC) (see 2.5.6.2) for review. The DSARC recommendations are submitted to the SECDEF for review and approval. A favorable DSARC recommendation and Secretary of Defense (SECDEF) approval, documented in an SDDM, provides the PM, for ACAT I programs, the authority to enter the next phase of the acquisition process.

NOTE: Normally the Milestone III decision for an ACAT I program is delegated, by the SECDEF, to the SECNAV unless the thresholds established at Milestone II are breached.

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.

DODINST 7045.7 (SECNAV 5000.16), "The Planning, Programming, and Budgeting System," provides official guidance on the POM process.

DODDIR 5000.1, "Major System Acquisitions," establishes fundamental overall policy for systems development and acquisition. The management principles in the directive are applicable to all programs.

DODINST 5000.2, "Major System Acquisition Procedures."

DODDIR 5000.3, "Test and Evaluation."

SECNAVINST 5000.1, "System Acquisition."

OPNAVINST 5000.42, "RDT&E/Acquisition Procedures."

NAVMATINST 5000.19, "Acquisition Program Review."

NAVMATINST 5210.4, "Acquisition Program Documentation."

For specific information on aspects of the process, consult the directives referenced following the various portions of Section 2.5.

MASTER REFERENCE LIST

The 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 **Department of the Navy RDT&E 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 (SECNAV 3200.25), "Major Range and Test Facility Base." (7.3.2; 7.3.3; 7.3.5; G)

DODDIR 3200.12 of 2/15/83 (SECNAV 3900.43), "DOD Scientific and Technical Information Program." (1.5.3; D; D1; D3)

DODMAN 3200.12-M-1, "Research and Technology Work Unit Information System Data Input Manual." (C10)

DODREG 3200.12-R-1 of 8/83, "Research and Technology Work Unit Information System Regulation." (D; D3.1.1)

DODREG 3200.12-R-2, "Centers for Analysis of Scientific and Technical Information." (D; D4)

DODDIR 3201.1 of 3/9/81 (SECNAV 3910.3), "Management of DOD Research and Development Laboratories." (F)

DODINST 3201.3 of 3/31/81 (SECNAV 3910.3), "DOD Research and Development Laboratories." (F)

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, "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)

DODINST 4105.59 of 10/24/83 (NAVMAT 4330.29), Department of Defense Plant Cognizance Program." (6.7.5)

DODDIR 4105.62 of 1/6/76 (NAVMAT 4200.49), "Selection of Contractual Sources for Major Defense Systems." (6; 6.6.4, 6.6.5)

DODINST 4105.64 of 5/8/70 (NAVMAT 5300.5), "Technical Representation at Contractor's Facilities." (6.7.5)

DODINST 4245.3 of 4/6/83, "Design to Cost." (2.7)

DODDIR 5000.1 of 3/29/82, System Acquisitions." (1.2.4; 1.6; 2; 2.2.10; 2.5; 2.5.1.2; 2.5.3; 2.5.3.5; 2.5.4; 2.5.5.1; 2.5.5.2; 3.5.5.3; 2.5.6.2; 2.5.7.1; 2.6; 2.7; 7.1.3; 7.1.4; 7.2.10; 7.4.2; E1.7; E9.2; J)

DODDIR 5000.2 of 3/8/83, "Major System Acquisition Procedures." (1.2.2; 2; 2.2.3; 2.210; 2.5; 2.5.1.1; 2.5.1.2; 2.5.1.3; 2.5.3; 2.5.3.5; 2.5.5.1; 2.5.5.2; 2.5.5.3; 2.5.6.2; 2.5.7.1; 7.1.3; 7.5; E9.2; J)

DODDIR 5000.3 12/26/79, "Test and Evaluation." (1.2.3.2; 2.5.1.4; 2.5.5.5; 7.1.3; 7.1.6; 7.2.1.1; 7.4; 7.4.4.4; 7.5; 7.8; G2.1; J)

DODDIR 5000.4 of 10/30/80 (SECNAV 7000.19), "OSD Cost Analysis Improvement Group." (2.7)

DODDIR 5000.19 of 3/12/76 (OPNAV 5214.7), "Policies for the Management and Control of Information Requirements." (6.7.1)

DODDIR 5000.23 of 11/26/74, "System Acquisition Management Careers." (1.6.3)

DODDIR 5000.39 of 1/17/80 (SECNAV 5000.39), "Acquisition and Management of Integrated Logistic Support for Systems and Equipment." (2.6)

DODDIR 5010.22 of 3/25/82 (SECNAV 5000.23), "DOD Contract Studies Management." (2.2.4.1)

DODDIR 5025.1 if 10/16/80, "Department of Defense Directive System." (B4)

DODDIR 5100.1 of 1/26/80 (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 (OPNAV 5410.17), "Administrative Arrangements for the National Security Agency." (E1.8.6)

DODDIR 5100.50 of 5/24/73, "Protection and Enhancement of Environmental Quality." (6.1.2)

DODDIR 5105.19 of 8/10/78 (OPNAV 5410.12); "Defense Communications Agency (DCA)." (E1.8.2)

DODDIR 5105.21 of 5/19/77, "Defense Intelligence Agency." (E1.8.4)

DODDIR 5105.22 of 6/8/78, "Defense Logistics Agency (DLA)." (E1.8.5)

DODDIR 5105.31 of 11/3/71, "Defense Nuclear Agency (DNA) (C)." (E1.8.1)

DODDIR 5105.36 of 6/8/78, "Defense Contract Audit Agency." (E1.8.3)

DODDIR 5105.41 of 6/8/78, "Defense Advanced Research Projects Agency (DARPA)." (E1.1.1)

DODDIR 5111.1 of 10/27/78, "Under Secretary of Defense for Policy." (1.2.2; E1.2)

DODDIR 5118.3 of 7/11/72, "Assistant Secretary of Defense (Comptroller)." (E1.4)

DODDIR 5124.1 of 7/26/82, "Assistant Secretary of Defense (Manpower, Reserve Affairs, and Logistics)." (E1.5)

DODDIR 5129.1 of 1/25/84, "Under Secretary of Defense for Research, Engineering, and Systems." (1.2.3; E1.1)

DODDIR 5129.22 of 6/26/78, "Defense Science Boa..." (E9.1)

DODDIR 5141.1 of 9/22/82, "Director, Program Analysis and Evaluation." (E1.6)

DODDIR 5141.2 of 4/2/84, "Director of Operational Test and Evaluation (1.2.3.3; 7.2.1.2; G2.2)

DODDIR 5200.20 of 9/24/70 (NAVMAT 5200.29), "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)

DODDIR 6050.1 of 7/30/79, "Environmental Effects in the United States of DOD Actions." (6.1.2)

DODINST 7000.2 of 6/10/77 (SECNAV 7000.17), "Performance Measurement for Selected Acquisitions." (6.7.1)

DODINST 7000.3 of 3/2/83 (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)

DODDIR 7000.11 of 3/27/84 (SECNAV 7000.20), "Contractor Cost Data Reporting." (6.7.4.2)

DODINST 7040.4 of 3/5/79 (SECNAV 7045.9), "Military Construction Authorization and Appropriation." (2.6.2)

DODINST 7040.5 of 9/1/66 (SECNAV 7040.6), "Definitions of Expense and Investment Costs." (5.3.3)

DODINST 7041.3 of 10/18/72 (SECNAV 7000.14), "Economic Analysis and Program Evaluation for Resource Management." (2.7)

DODINST 7045.7 of 5/23/84 (SECNAV 5000.16), "Implementation of the Planning, Programming and Budgeting System." (3; 3.3; 3.4; 4.2; 4.4; 4.4.4.2; J)

DODINST 7110.1 of 10/30/80, "DOD Budget Guidance." (5.1.1)

DODDIR 7200.1 of 5/7/84, "Administrative Control of Appropriations." (5)

DODINST 7220.1 of 5/4/71, "Regulations Governing the Use of Project Orders." (5.1.1; 6.2.4)

DODINST 7220.24 of 9/18/69, "Accounting for Research and Development." (5.3; 5.3.5)

DODDIR 7250.5 of 1/9/80 (NAVCOMPTINST 7133.1), "Reprogramming of Appropriated Funds." (5; 5.5)

DODINST 7250.10 of 1/10/80 (NAVCOMPTINST 7133.1), "Implementation of Reprogramming of Appropriated Funds." (5.5)

DODDIR 7410.4 of 4/16/82, "Industrial Funds Operations." (5; 5.3.4.1)

DODINST 7410.5 of 1/3/75, "Financial Reports for Department of Defense Industrial Funds." (5.3.4.1)

DODDIR 7600.2 of 8/7/78, "Audit Policies." (5.6)

DODINST 7600.3 of 1/4/74, "Internal Audit in the Department of Defense." (5.6)

DODDIR 7650.2 of 11/17/80, "General Accounting Office Audits and Reports." (5.6)

INSURV

INSURVINST 13,100.1B of 1/1/76, "Aircraft Service Acceptance Trials, Procedures for." (7.4.3)

MARINE CORPS

MCO 3900.3D of 5/4/77, Marine Corps Research, Development, Test, and Evaluation." (6.8)

MCO 3900.4C of 9/10/84, "Marine Corps Program Initiation and Operational Requirements Documents." (2.5.9)

MCO 3900.11C of 6/15/83, "Marine Corps Research, Development, Test and Evaluation (RDT&E) Work Directives and Associated Documents." (6.2.4)

MCO 3900.12A of 6/11/82, "Marine Corps Exploratory Development Program." (2.4)

MCO 3960.2 of 3/29/78, "Marine Corps Operational Test and Evaluation Activity (MCOTEA); establishment of." (7.2.10.2; G4.2)

MCO P5000.10A of 1/27/81, "Systems Acquisition Management Manual." (1.7.11; 2; 2.5.6.7; 2.5.9; 6.8; 7.2.10.3; E6; E9,4)

MCO 5000.11A of 7/2/79, "Testing and Evaluation of Systems and Equipment for the Marine Corps." (7.2.10.3)

NAVCOMPT

NAVCOMPTINST 7044.5E of 9/1/81, "DOD In-House RDT&E Annual Activities Report." (F)

NAVCOMPTINST 7044.8 of 6/25/74, "Reimbursable Orders Citing the Research, Development, Test and Evaluation, Navy (RDT&E,N) Appropriation." (5.3)

NAVCOMPTINST 7102.2 of 4/27/83, "Guidance for the Preparation, Submission and Review of Department of the Navy (DON) Budget Estimates." (Promulgates *DON Budget Guidance Manual.* Distribution limited primarily to major claimants for funds.) (2.2.7; 4; 4.3.2; 4.4.4.1; 5.3.3; C8)

NAVCOMPTINST 7121.3D of 10/6/67, "Department of the Navy annual budget hearings

before the Congressional Appropriations Committees; information for witnesses." (4; 4.8)

NAVCOMPTINST 7130.25D of 11/9/79, "Procedures for the Annual Review and Implementation of Congressional Actions of Authorization and Appropriation Acts Affecting DOD and Related Congressional Reports." (5.1.4)

NAVCOMPTINST 7133.1C of 5/8/80, "Procedures and Reporting Requirements Related to the Reprogramming of Appropriated Funds; implementation of." (5.5)

NAVCOMPTINST 7331.1E of 8/1/78, "Navy and Marine Corps Industrial Fund Quarterly Reports; requirement for." (5.3.4.1; 5.5)

NAVMAT

NAVMATINST 2410.1B of 10/1/79, "Electromagnetic Environmental Effects (E3) Policy Withing the Naval Material Command." (7)

NAVMATINST 3000.1A of 4/22/77, "Reliability of Naval Material." (7.7)

NAVMATINST 3120.1C of 7/26/79, "Procedures and Responsibilities for Certification of Aviation Facilities in Naval Ships Operating Aircraft." (7.8.5)

NAVMATINST 3880.1C of 11/3/82, "Scientific and Technical Intelligence Liaison Officer (STILO) Program and Intelligence Support for the Naval Material Command." (2.2.3)

NAVMATINST 3882.2A of 4/21/80, "Threat Support for RDT&E and Weapon Systems Selection and Planning." (2.2.3)

NAVMATINST 3900.3B of 7/8/74, "RDT&E technical Information Required when Preparing Justification for Authority to Negotiate (JAN) RDT&E contracts." (6.3.4)

NAVMATINST 3900.4C of 4/6/83, "Advanced Planning Briefings for Industry (APBI)." (D; D7)

NAVMATINST 3900.11C of 5/8/84, "Industry Independent Research and Development (IR&D)." (6.5.6.3; D; D3.1.2)

NAVMATINST 3900.14 of 8/6/76, "Navy/Industry Cooperative Research and Development Program (NICRAD)," (D; D6)

NAVMATINST 3900.15 of 5/5/77, "Certification and Registration for Access to DOD Scientific and Technical Information." (D; D3.3)

NAVMATINST 3910.16A of 2/29/72, "Naval Material Command Development Support for the Marine Corps." (6.8)

NAVMATINST 3910.20A of 6/15/81, "Management of the Navy Exploratory Development Program." (2; 2.4; C4; E4.2.6.1)

NAVMATINST 3920.3C of 7/27/83, "In-House Laboratory Independent Research (IR) and Independent Exploratory Development (IED) Programs.) (6; 6.2.6)

NAVMATINST 3960.6B of 2/9/81, "Test and Evaluation." (7; 7.3.2; 7.2.6; 7.5; G)

NAVMATINST 3960.7A of 4/6/77, "Test and Evaluation of Ship Acquisition." (7; 7.8)

NAVMATINST 3960.8 of 9/1/76, "Land-Based Test Site (LBTS) Selection Policy." (7.3.4; 7.8; G)

NAVMATINST 4000.15A of 2/2/71, "Department of the Navy Data Management Program." (6.5.6.2)

NAVMATINST 4000.20B of 6/27/75, "Integrated Logistic Support Planning Policy." (2.6; 7.7)

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ABBREVIATIONS

ACAT	Acquisition Category
ACNO	Assistant Chief of Naval Operations
ACO	Administrative Contracting Officer
ADD	Automatic Document Distribution
ADL	Authorized Data List
ADM	Advanced Development Model
ADP	Automatic Data Processing
ADPE	Automatic Data Processing Equipment
AFP	Approved for Full Production
AFSC	Air Force Systems Command
AMC	Army Materiel Command
AMRAD	DOD Air Munitions Requirements and Development Committee
AMSL	Acquisition Management Systems List
Ao	Operational Availability
AP	Acquisition Plan
APBI	Advanced Planning Briefings for Industry
APL	Applied Physics Laboratory
ARB	Acquisition Review Board
ARC	Acquisition Review Committee
ASD (–)	Assistant Secretary of Defense for (––––––)
ASN (M&RA)	Assistant Secretary of the Navy (Manpower and Reserve Affairs
ASN (R,E&S)	Assistant Secretary of the Navy (Research, Engineering, and Systems)
ASN(S&L)	Assistant Secretary of the Navy (Shipbuilding and Logistics)
ASO	Aviation Supply Office
ASWSP	Anti-Submarine Warfare Systems Project
AT	Acceptance Trials
ATD	Advanced Technology Development
ATE	Automatic Test Equipment
AUTEC	Atlantic Undersea Test and Evaluation Center
AUTOVON	Automatic Voice Network
BT	Builder's Trials
CAIG	Cost Analysis Improvement Group
CAO	Cost Analysis Organizations
CAS	Contract Administration Services
CBO	Congressional Budget Office
CCDR	Contractor Cost Data Reporting
CDPS	Consolidated Decision Package Set
CDR	Critical Design Review
CE	Current Estimate
CEB	CNO Executive Board
CEB/ARC	CNO Executive Board/Acquisitions Review Council
CEIS	Candidate Environmental Impact Statement
CFE	Contractor-Furnished Equipment
CFSR	Contract Funds Status Report
CFY	Current Fiscal Year
CG (–)	Commanding General (––––––)
C^3I	Command and Control and Communications and Intelligence
CinC (–)	Commander in Chief, (––––––)
CIP	Critical Intelligence Parameter
CIR	Cost Information Reports
CJCS	Chairman, Joint Chiefs of Staff
CMC	Commandant of the Marine Corps
CNA	Center for Naval Analyses
CND	Chief of Naval Development
CNM	Chief of Naval Material
CNO	Chief of Naval Operations
CNR	Chief of Naval Research
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
CPP	Claimant Program Proposal
CPPG	CNO Policy and Planning Guidance
CPR	Cost Performance Report
CSCSC	Cost/Schedule Control Systems Criteria
CTE	Contractor Technical Evaluation
DA	Developing Agency
DAC	Defense Acquisition Circular
DADM	Decision Authority Decision Memorandum
DAE	Defense Acquisition Executive
D&F	Determinations and Findings
D&V	Demonstration and Validation
DAR	Defense Acquisition Regulation
DAR	Development Acquisition Report
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
DCNM (–)	Deputy Chief of Naval Material for (––––––)
DCNO (–)	Deputy Chief of Naval Operations for (––––––)
DCP	Decision Coordinating Paper
DCS	Defense Communications System
DC/S (–)	Deputy Chief of Staff Marine Corps for (––––––)
DC/S (RD&S)	Deputy Chief of Staff Marine Corps (Research, Development and Studies)
DDTE	Director Defense Test and Evaluation
DE	Development Estimate
DEP (–)	Deputy (––––––)
DFARS	DOD FAR Supplement
DG	Defense Guidance
DIA	Defense Intelligence Agency
DID	Data Item Description
DLA	Defense Logistics Agency
DLP	Director of Laboratory Programs
DMSO	Director Major Staff Office
DNA	Defense Nuclear Agency
DNCPG	DON Consolidated Programming Guidance
DNFYP	Department of the Navy Five-Year Program
DNL	Director of Navy Laboratories
DNPP	Director Navy Program Planning
DNPPG	Department of the Navy Policy and Planning Guidance

DNSARC	Department of the Navy Systems Acquisition Review Council
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 (OP-098)
DROLS	Defense RDT&E On-Line Systems
DSARC	Defense Systems Acquisition Review Council
DSB	Defense Science Board
DSMC	Defense Systems Management College
DT&E	Developmental Test and Evaluation
DTC	Design-to-Cost
DTIC	Defense Technical Information Center
DTNSRDC	David W. Taylor Naval Ship R&D Center
DWSIG	Director Weapons Support Improvement Group
ECCM	Electronic Counter Countermeasures
ECM	Electronic Countermeasures
ECP	Engineering Change Proposal
EMC	Electromagnetic Compatibility
EPA	Extended Planning Annex
EPS	Engineered Performance Standards
ESA	Naval Weapons Engineering Support Activity
ESO	Electronics Supply Office
ETS	Engineering Technical Services
EW	Electronic Warfare
FAR	Federal Acquisition Regulation
FCRC	Federal Contract Research Center
FCT	Final Contract Trials
FFP	Firm Fixed Price
FIP	Fleet Introduction Program
FMF	Fleet Marine Forces
FMR	Financial Management Report
FOT&E	Follow-on Operational Test and Evaluation
FPI	Fixed-Price Incentive
FSED	Full-Scale Engineering 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)
GPO	Government Printing Office
GRA	Government Research Announcement
HASC	House Armed Services Committee
HQMC	Headquarters Marine Corps
HQNAVMAT	Headquarters, Naval Material Command
IAC	Information Analysis Center
ICE	Independent Cost Estimates
ICP	Inventory Control Point
IDA	Institute for Defense Analyses
ILS	Integrated Logistic Support
ILSM	ILS Manager
INS	Institute of Naval Studies
INSURV	Board of Inspection and Sur v
IOC	Initial Operational Capa' ate)
IOT&E	Initial Operational Test and Evaluation
IPS	Integrated Program Summary
IR&D	Independent Research and Development
IR/IED	Independent Research/Independent Exploratory Development
ITP	Integrated Test Package
JCS	Joint Chiefs of Staff
JIEP	Joint Intelligence Estimate for Planning
JLRSA	Joint Long-Range Strategic Appraisal
JMSNS	Justification for Major System New Start
JPAM	Joint Program Assessment Memorandum
JSCP	Joint Strategic Capabilities Plan
JSO	Joint Service Office
JSPD	Joint Strategic Planning Document
JSPS	Joint Staff Planning System
JT&E	Joint Test and Evaluation
LCC	Life Cycle Cost
LRG	Logistics Review Group
LRG	Navy Long-Range Guidelines
LRO	Navy Long-Range Objectives
MARCORPS	Marine Corps
MBI	Major Budget Issues
MCDEC	Marine Corps Development and Education Command
MCOTEA	Marine Corps Operational Testing and Evaluation Activity
MEWS	Mission-Essential Weapon System
MIC	Management Information Center
MI/DS	Management Information/Data Systems
MILCON/ MCON/ MICON	Military Construction (Appropriation)
MIL-STD	Military Standard
MIP	RDT&E,N Management Information Paper
MIPR	Military Inter-Departmental Purchase Request
MIS	Management Information System
MIS	Metrology Information Service
MLRP	Marine Corps Long-Range Plan
MM&SC	Major Mission & Support Category
MMROP	Marine Corps Mid-Range Objectives Plan
MRO	Mid-Range Objectives
MRTFB	Major Range and Test Facility Base
MSARC	Marine Corps Systems Acquisition Review Council
MTBF	Mean Time Between Failures
MTTR	Mean Time to Repair
MUL	Master Urgency List
MWDDEP	Mutual Weapons Development Data Exchange Program
MYP	Multi-Year Procurement
NADC	Naval Air Development Center
NADEC	Navy Decision Center
NAE	Navy Acquisition Executive
NAILSC	Naval Air Integrated Logistic Support Center
NAMRL	Naval Aerospace Medical Research Laboratory
NARDIC	Navy Acquisition Research and Development Information Center
NARSUP	Navy Supplement to FAR and DFARS
NATC	Naval Air Test Center
NAVAIR	Naval Air Systems Command Headquarters
NAVCOMPT	Office of the Comptroller of the Navy
NAVELEX	Naval Electronic Systems Command
NAVFAC	Naval Facilities Engineering Command
NAVIC	Navy Information Center
NAVMAT	Naval Material Command
NAVMEDCOM	Naval Medical Command
NAVSEA	Naval Sea Systems Command
NAVSUP	Naval Supply Systems Command
NBDL	Naval Biodynamics Laboratory
NCEL	Naval Civil Engineering Laboratory
NCIS	Navy Cost Information System
NCP	Navy Capabilities Plan
NCSC	Naval Coastal Systems Center
NCTRF	Naval Clothing and Textile Research Facility
NDCP	Navy Decision Coordinating Paper
NDRI	Naval Dental Research Institute
NEODTC	Naval Explosive Ordnance Disposal Technology Center
NEPRF	Naval Environmental Prediction Research Facility
NHRC	Naval Health Research Center
NIB	Not-to-Interfere Basis
NICRAD	Navy/Industry Cooperative R&D Program

NIF	Navy Industrial Fund
NISC	Naval Intelligence Support Center
NLRG	Navy Long-Range Guidance
NMARC	Navy and Marine Corps Acquisition Review Committee
NMC	Naval Material Command
NMCSA	Naval Material Command Support Activity
NMRG	Navy Mid-Range Guidance
NMRI	Naval Medical Research Institute
NOA	New Obligational Authority
NOSC	Naval Ocean Systems Center
NPE	Navy Preliminary Evaluation
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
NSWSES	National Ship Weapons Systems Engineering Station
NTE	Navy Technical Evaluation
NTEC	Naval Training Equipment Center
NTIS	National Technical Information Service
NTP	Navy Training Plan
NUSC	Naval Underwater Systems Center
NWC	Naval Weapons Center
O&MN	Operation and Maintenance, Navy (Appropriation)
OJCS	Office of the Joint Chiefs of Staff
ONR	Office of Naval Research
ONT	Office of Naval Technology
OPA	Office of Program Appraisal
OPEVAL	Operational Evaluation
OPN	Other Procurement, Navy (Appropriation)
OPTEVFOR	Operational Test and Evaluation Force
OR	Operational Requirement
OSIP	Operational Safety Improvement Program
OT&E	Operational Test and Evaluation (Research and Engineering)
PAMN	Procurement of Aircraft and Missiles, Navy (Appropriation)
PAR	Production Acquisition Report
PAT&E	Production Acceptance Test and Evaluation
PBD	Program Budget Decision
PC	Program Coordinator
PCD	Program Change Decision
PCR	Program Change Request
PD	Program Director
PDA	Principal Development Activity
PDM	Program Decision Memorandum
PDRC	Program Development Review Committee
PDS	Primary Development Service/Agency
PE	Program Element
PES	Program Evaluation Summary
PIC	Navy Department Program Information Center
PM	Program Manager
PMP	Program Management Proposal
PMTC	Pacific Missile Test Center
POE	Projected Operational Environments
POM	Program Objectives Memorandum
PPBS	Planning, Programming, and Budgeting System
PR	Procurement Request
PRESINSURV	President, Board of Inspection and Survey
PSA	Post Shakedown Availability
QMR	Qualitative Material Requirements (Army)
QPL	Qualified Products List
RAN	Request for Authority to Negotiate
R&D	Research and Development
R&M	Reliability and Maintainability
R&TWUIS	Research and Technology Work Unit Information System
RD&E	Research, Development, and Engineering
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
S&T	Science and Technology
SAP	Ship Acquisition Plan
SAR	Selected Acquisition Report
SARC	Systems Acquisition Review Council
SC	System Concept
SCIB	Ship Characteristics and Improvement Board
SCN	Shipbuilding and Conversion, Navy (Appropriation)
SCP	System Concept Paper
SDDM	Secretary of Defense Decision Memorandum
SDI	Selective Dissemination of Information
SDO	Ship Development Objective
SECDEF	Secretary of Defense
SECNAV	Secretary of the Navy
SHAPM	Ship Acquisition Project Manager
SIOP	Single Integrated Operational Plan
SLEP	Service Life Extension Program
SNDL	Standard Navy Distribution List
SNDM	SECNAV Decision Memorandum
SPE	Systems Performance Effectiveness
SPEED	Special Procedures for Expediting Equipment Development
SPP	Sponsor Program Proposal
SPP	Subproject Program Plan
SPR	Sponsor's Program Review
SPRDD	Sponsor's Program Review Decision Document
SSA	Source Selection Authority
SSAC	Source Selection Advisory Council
SSEB	Source Selection Evaluation Board
STI	Scientific and Technical Information
STO	Science and Technology Objective
SVIC	Shock and Vibration Information Center
SWBS	Ship Work Breakdown Structure
SYSCOM	Systems Command
TAB	Technical Abstracts Bulletin
TAD	Technology Area Description
T&E	Test and Evaluation
TC^3	Tactical Command and Control and Communications
TDD	Test Development Director
TECG	Test and Evaluation Coordinating Group
TECHEVAL	Technical Evaluation
TEMP	Test and Evaluation Master Plan
TEPG	Test and Evaluation Planning Group
TLR/TLS	Top Level Requirements/Top Level Specifications
TOA	Total Obligation Authority
TOR	Tentative Operational Requirement
TPFG	Technology Programming and Fiscal Guidance
TPPG	Technology Policy and Planning Guidance
TSTD	Total Ship Test Director
USDP	Under Secretary of Defense, Policy
USDRE	Under Secretary of Defense, Research and Engineering
UT	Underway Trials
VCNM	Vice Chief of Naval Material
VCNO	Vice Chief of Naval Operations
VE	Value Engineering
WBS	Work Breakdown Structure
WSIG	Weapons Support Improvement Group