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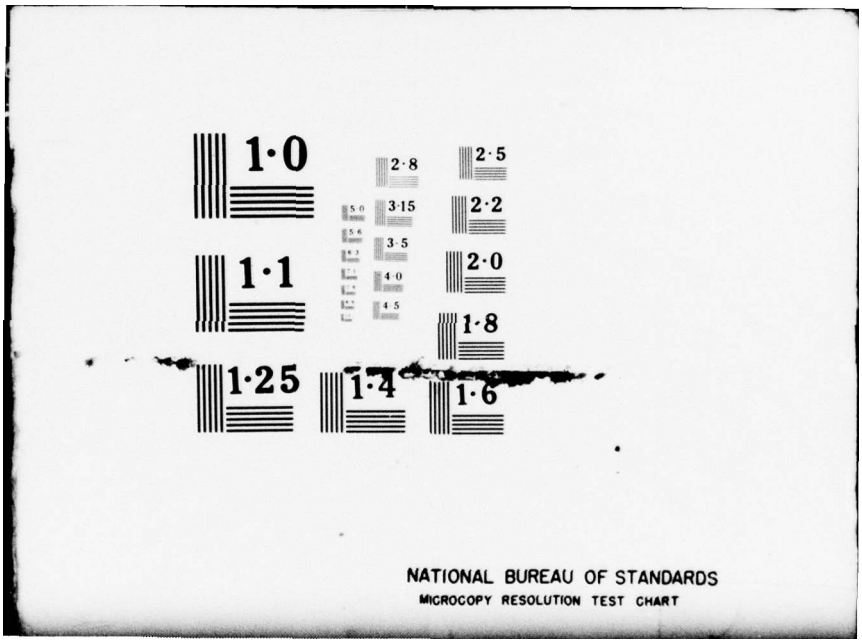
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DEFENSE SYSTEMS MANAGEMENT COLLEGE

PROGRAM MANAGEMENT COURSE
INDIVIDUAL STUDY PROGRAM

PROGRAM MANAGEMENT
IN LESS-THAN-MAJOR CONVENTIONAL
AIR-LAUNCHED WEAPONS PROJECTS

STUDY PROJECT REPORT
PMC 77-2

Herbert Henry Joseph Nicholson
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FORT BELVOIR, VIRGINIA 22060

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DEFENSE SYSTEMS MANAGEMENT COLLEGE

STUDY TITLE: PROGRAM MANAGEMENT IN LESS-THAN-MAJOR CONVENTIONAL AIR-LAUNCHED WEAPONS PROJECTS

STUDY PROJECT GOALS:

To identify the management techniques used, planning and regulations involved, and the problems encountered in the subject area.

STUDY REPORT ABSTRACT:

This study examined less-than-major acquisition programs in the conventional air-launched weapons field in terms of management approaches and potential problem situations.

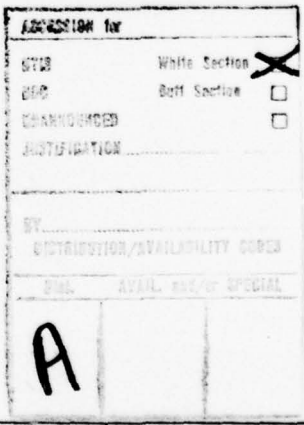
The report brings out problems concerning personnel and staffing in the program office, management information systems, inter/intra-agency interface, and multiple and joint service situations.

The information was derived from files and interviews with personnel associated with conventional weapons research and development activities.

SUBJECT DESCRIPTORS:

Program/Project Management, Types of Systems, Common Technology Subsystems (10.02.03.04).

Less-Than-Major Weapon Systems



NAME, RANK, SERVICE
Herbert H. J. Nicholson
Commander, USN

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November 1977

PROGRAM MANAGEMENT IN LESS-THAN-MAJOR CONVENTIONAL AIR-LAUNCHED WEAPONS PROJECTS

Individual Study Program

Study Project Report

Prepared as a Formal Report

Defense Systems Management College

Program Management Course

Class 77-2

by
Herbert H. J. Nicholson
Commander USN

November 1977

Study Project Advisor
Major Richard Clark, USAF

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EXECUTIVE SUMMARY

While major defense weapons systems dominate the scene in terms of individual cost, visability, and political ramifications, a much larger number of less-than-major weapon systems are currently authorized and managed by the various Material Systems Commands. While these lesser cost systems have not received significant attention at higher echelons and are generally managed by lower rank and grade personnel, they do provide a significant portion of the overall systems which provide for the combat readiness of the fleet.

With this significance in mind, it is the purpose of this study to review management approaches to less-than-major programs as they applied to conventional air-launched weapons programs in the Navy. Potential problem situations are discussed for their possible concern to the program manager.

The information for this study was obtained from the files of the Armament Division, Naval Air Systems Command, and by interviews with individuals associated with conventional weapons research and development activities.

No specific conclusions or recommendations were made by those interviewed. The conclusions reached and the recommendations made were those of the author on the basis of the information received and on personal experience in the field.

SECTION I

INTRODUCTION

Much literature has been written, as well as considerable oral discussion conducted, concerning management of designated major programs within the Services. Guidance is provided from the highest levels in the Department of Defense and each subsequent echelon to that of the manager himself in order to provide for the planning and control of these major programs. Considerable documentation is required along with extensive reviews in order to assure all echelons the parameters of cost, schedule, and performance are being met in a manner dictated by the real or perceived environment. This wealth of documentation, regulations, and reviews is helpful in management or is considered necessary in order that the aforementioned parameters be kept in check.

While the principles and a number of the regulations pertaining to designated major programs apply to less-than-major programs (those which have not met the criteria as specified in Department of Defense Directive 5000.1[1]), much less guidance has been provided for management of these less-than-major programs. This report will delve into a narrow segment of less-than-major programs in the Department of Defense (DOD); that of U. S. Navy research and development for conventional air-launched weapons. Joint service programs are considered in the case that the Navy is the lead service. The discussion and problems discussed

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[1]DODD 5000.1, "Major Systems Acquisitions," 18 Jan 1977, Page 2

in the subsequent sections will apply in principle, in many cases, to other than projects involving munitions, but will not be addressed in detail due to the constraint of time.

A myriad of situations presented to the program manager of these programs will be discussed as will be problems which have been encountered or may be envisioned as a potential problem in management. The situations and problems which will be presented in the subsequent sections are neither intended to be all inclusive nor applicable to all other less-than-major programs. They have been derived from investigation of current U. S. Navy programs in the conventional weapons area.

SECTION II

BACKGROUND

Management of most Navy air-launched weapons programs is under the cognizance of the Naval Air Systems Command. Within the Command, management of less-than-major research and development programs in the Validation and Demonstration Phase is assigned to the Assistant Commander for Research and Technology (AIR-03). For most munitions and armament programs, this is further assigned to a functional technology administrator, normally the Ordnance Administrator (AIR-350). This division may be assisted technically by divisions within the Material Acquisition Group (AIR-05). When a program is funded as a program element in the Full Scale Engineering Development (Category 6.4) portion of the budget, management is assigned to the Assistant Commander for Material Acquisition. Armament material, other than guided missile systems, is placed under the Armament Division (AIR-532). The Division Director is "double-hatted". He is the functional acquisition manager for armament systems and equipment assigned to him and as such reports to the Assistant Commander for Material Acquisition. He has also been tasked as the Program Manager for Armament Systems. In the latter case, he has direct reporting authority to the Commander, Naval Air Systems Command. While the relationship may seem to be redundant, the assignment provides for direct reporting relationships and authority in a generic field and allows the horizontal interface characteristic of matrix management. Program managership in a functional group was

established[2] in order to provide an integrated acquisition management of the designated commodity area. It provides for the centralized direction and guidance of less-than-major systems in development, production modification, and initial logistic support. The relationships, authorities, responsibilities, and accountability of the Program Manager are similar to those of major weapon system Project Managers. It should be noted that within the Navy, the terms "Project Manager" and "Project Management" are limited to designated projects[3] as outlined in DODD 5000.1. The principle of a Program Manager for a generic set of commodities may be considered akin to that of the Air Force "basket" Systems Program Office (SPO) principle.

Important, critical, or high priority projects requiring an intensified level of program management are assigned, within the Armament Division, to a military Deputy Program Manager for..., while less critical systems, subsystems, or component projects are managed by subordinate supervisors or engineers who "double-hat" in this capacity. There are currently five less-than-major armament research and development projects which fall into the "intensified" management category. Two of these are Navy lead, joint/multiple service projects, while the remainder have the Air Force assigned as the lead service.

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[2]NAVAIR NOTICE 5400 of 21 Apr 76, "Program Managers in Material Acquisition Group; establishment of"

[3]SECNAVINST 5000.1, "System Acquisition in the Department of the Navy", 13 Mar 1972, Encl. (3), Page 1

The remainder of this paper will concentrate on those programs in which the Navy has been assigned as the lead service or in which only the Navy has indicated a requirement.

SECTION III

DISCUSSION

Program Authorization

Authorization to proceed with a less-than-major program follows a similar philosophy to that of a major program without the requirement for a Mission Element Need Statement (MENS), a Decision Coordinating Paper (DCP), or a Defense System Acquisition Review Council (DSARC) approval. A Navy Operational Requirement is staffed within the Office of the Chief of Naval Operations. For munitions, program requirement sponsorship is normally assigned to the Air Weapons System Office (OP-506F) of the Aviation Plans and Requirements Division. By a joint service agreement[4], these requirements are submitted to the Department of Defense Air Munitions Requirements and Development (AMRAD) Committee for harmonization of Service qualitative requirements and characteristics. If the munition is nominated for joint use, comments are requested from the other Services and eventually forwarded to the Under Secretary of Defense, Research and Engineering (formerly Director, Defense Research and Engineering) for approval of a joint program. An executive service will be designated to manage and fund the effort. Participating Service peculiar requirements are funded by that Service, while joint requirements are funded by the executive service. The executive service is responsible for preparation and staffing of a Joint Service Opera-

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[4] Department of Defense, Research and Engineering, "Joint Service Agreement: Harmonization of Service Qualitative Requirements and Characteristics for Air Munitions," DDR&E memorandum dtd 27 Jan 1971

tional Requirement. A Development Plan is required as the basic management document concerning the development program. In the case of a joint service requirement, a Joint Development Plan (JDP) is prepared by the program office. The JDP constitutes a joint agreement on the part of the Services signed by the Joint Logistics Commanders of the Services involved. The JDP is approved by the Under Secretary of Defense, Research and Engineering after concurrence by the AMRAD.

Program Management Organization

A program designated for "intensified" program management by the Armament Program Manager is provided a Deputy Program Manager (DPM). The DPM is normally a military officer provided from the normal manpower assets of the Armament Division. The DPM provides management coordination and execution of the program under the guidance and direction of the Armament Program Manager. In the event that the Navy is assigned as the Participating Service, a DPM is also assigned as a deputy to the Air Force Systems Program Director (or comparable Army manager). A typical joint organization and functional relationship chart is shown in Figure 3-1.

With project control delegated to the Deputy Program Manager, the project organization is basically an individual - the DPM. He exercises project control through the functional branches of the Armament Division and functional divisions throughout the Naval Air Systems Command Headquarters. Within the Armament Division, a few civilian personnel are specifically assigned to the program. These constitute a program engineer and a business manager/project control officer. Both of these

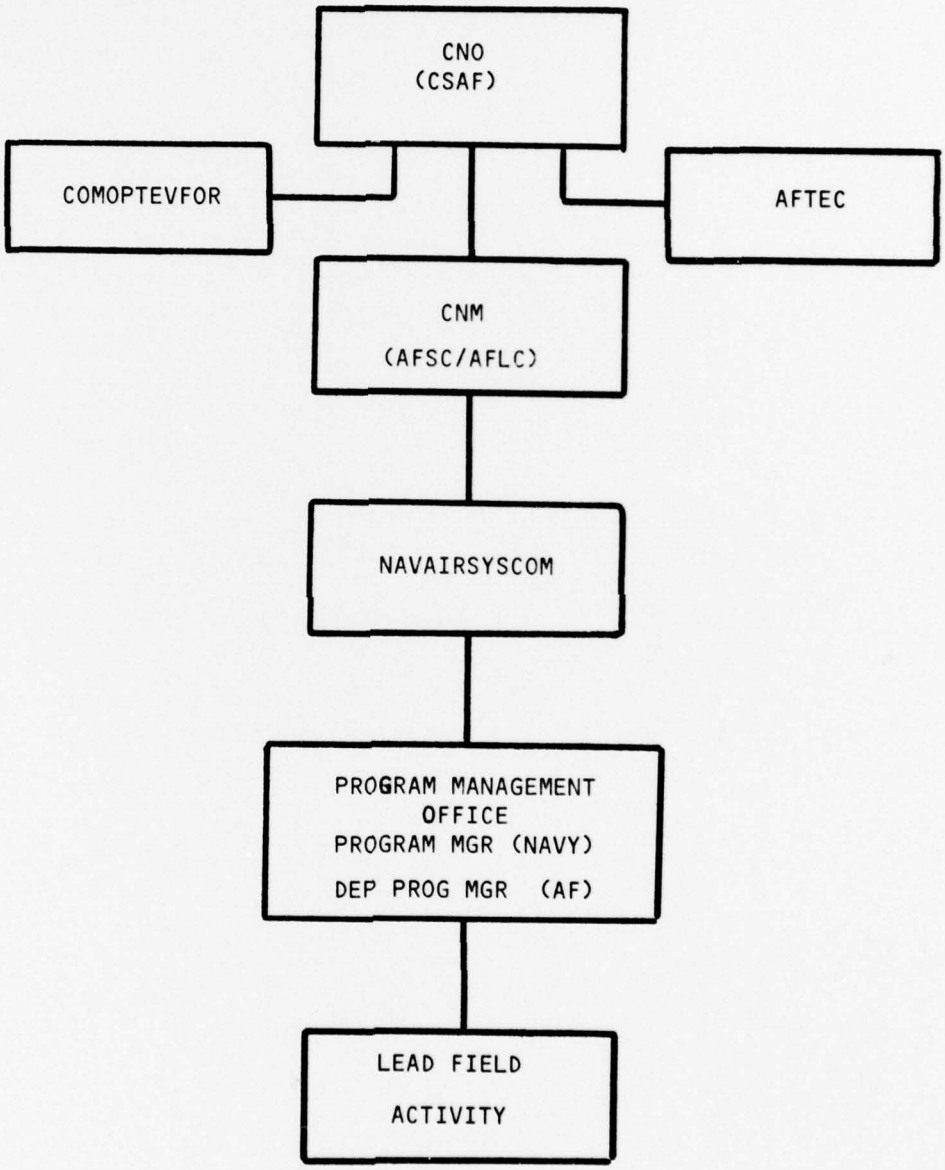

Figure 3-1. Joint Organizations and Functional Relationships.

personnel are normally time-shared with other acquisition programs. These three persons, the DPM, program engineer, and business manager, constitute the nucleus of the Program Management Office. Supplementary assistance is provided from within the Armament Division for budget accounting and specialized engineering management in areas such as fuzing, suspension and release equipment, and cartridge actuated devices. Additional support is provided within the Command for Logistics, ground support equipment, ship's compatibility, safety, etc., by the functional divisions.

Technical management for development of the system is assigned to a Lead Field Activity (LFA). The currently funded munitions projects for which the Navy is lead service have the Naval Weapons Center, China Lake, California, designated as the LFA. The LFA designates a project team headed by a Project Team Manager to be responsible for and execute all technical aspects of the project under the direction of the Program Manager. Participating Field Activities (PFA) are assigned program responsibilities in accordance with the established missions of each tasked organizational group. Examples of PFA involved in the development effort are:

Naval Surface Weapons Center, Dahlgren/White Oak

Naval Air Engineering Center, Philadelphia

Naval Weapons Evaluation Facility, Albuquerque

Pacific Missile Test Center, Pt. Mugu

Naval Air Test Center, Patuxent River

There may be 12 - 20 activities involved as Participating Field Activities

throughout the development and initial production phases. In addition, there are a number of Participating Commands which participate in test and evaluation and other activity as necessary. Examples of Participating Commands are:

Command Operational Test and Evaluation Forces (COMOPTEVFOR)

Tactical Air Command (TAC)

USAF Tactical Air Warfare Center (TAWC)

USAF Tactical Fighter Weapons Center (TFWC)

Air Force Test and Evaluation Center (AFTEC)

A Navy Development Coordinator is assigned to the program from the Tactical Air, Surface and Electronic Warfare Development Division (OP-982) of the Office of Research, Development, Test and Evaluation. The Development Coordinator provides for the necessary liaison and budget submission within the Office of the Chief of Naval Operations in response to the requirements of the Program Requirements Sponsor.

Program Review

Program review is handled in a number of ways depending on the issue involved or stage of development. Periodic program reviews chaired by the Program Manager or Deputy Program Manager are conducted, as well as specialty group reviews such as safety and integrated logistics support management. Reviews are also provided to the Commander, Naval Air Systems Command; Headquarters of the Chief of Naval Material; and the Office of Research, Development, Test and Evaluation. In the case of joint service programs of sufficiently high interest, reviews are also made to representatives of the Office of the Under Secretary of Defense,

Research and Engineering.

For joint development programs, in order to provide for review of program progress, evaluation of major decisions of the Program Manager, and to measure technical system characteristics, including cost, against stated requirements, there is established a Joint Development Review Panel (JDRP). The panel consists of equal numbers of individuals from the Naval Air Systems Command and the Air Force Systems Command and is chaired by the Navy senior member (for Air Force lead programs, the Air Force senior member chairs the panel). The panel may be convened upon request by either of the Services (in the event of a tri-service development, the Army would participate on an equal basis). A unanimous conclusion by the panel, regarding the issue in question, will allow the Program Manager to proceed as indicated. Non-concurrence by a portion of the panel members will require consideration and resolution of the issue by higher authority in the normal chain of command of the services prior to program action in the area of disagreement.

Program Control

Program control of less-than-major programs is analogous to that of major programs, tailored to the cost-effectiveness of implementation of specific control systems. A few representative systems will be discussed briefly.

Integrated Logistic Support program planning is applied at all stages of the life cycle addressing maintenance, personnel and training, technical data, support and test equipment, supply support, facilities,

transportation and handling as well as logistic support funding resources and logistic support management information. For joint, as well as single service programs, Standardized Integrated Support Management System[5] (SISMS) is applied to the program. SISMS is a multi-service agreement to use a uniform approach to logistic planning and management.

Plans are developed by the PMO and approved by the Program Manager (in the case of a multiple-service program, a joint concurrence is acquired from the participating services). Examples of plans and operating procedures developed are:

Logistic Support

Configuration Management

Data Management

Reliability and Maintainability

Systems Safety

Human Factors Engineering

Financial Management and Status Reporting

Cost, Schedule, and Performance Thresholds

The project information systems used depends on the complexity, stage of development, relationships between services, field activities, and contractor(s) involved in the program and the funds available for prosecution of the program. Both oral and written forms as well as formal and informal means are used in the information system. Manual and automated systems are in use involving computers, facsimile trans-

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[5]AFLCR/AFSCR 800-24/NAVMATINST 4000.38/AMCR 700-97, "Standard Integrated Support Management System," 10 Aug 1976

transmission, monthly and quarterly reports, minutes of meetings held, telephone conversations, in addition to simple notes and memoranda held by the various program team members. The distance involved between the Program Management Office, located in the Washington, D. C., area and the field locations has made the telephone a necessity for rapid updating of information as well as provision of guidance and decisions.

For the larger programs where NWC, China Lake, California, has been assigned as the Lead Field Activity, a computer-based management information system, termed the "MK III",* has been used. The MK III has provisions for plotting schedule, cost, and manpower resources and is capable of analysis of the relationships between events in order to determine critical points, slack, and dependency points.

Funding of the programs is based on Program Elements in the Five Year Defense Plan (FYDP) and as apportioned in the most recent Program Budget Decision (PBD). Assignments are provided to field activities either annually or on a case-by-case basis. The Lead Field Activity is normally provided their assignments on a fiscal year basis with amendments during the year as required. This assignment is transmitted by the use of an "Airtask/Work Unit Assignment" (NAVAIR Form 3930/1). Funds for the work described in the "Airtask" is provided to the activities by the use of a "Work Request" (NAVCOMPT Form 140). These funds may be provided incrementally as work progresses or in a lump sum depending on

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*The MK III Project Management System is a proprietary product of Program Control Corporation, Van Nuys, California

the agreements made between the field activity and the Program Management Office. Funds for work from another service or funds for work to be performed by another service is provided by a Military Inter-Departmental Purchase Request (MIPR).

The principles of design to cost (DTC), as outlined in DODD 5000.28[6], are applied to the majority of development programs, as well as life cycle cost (LCC) analysis, allowing initial financial planning. An updated LCC estimate is made when a definitive design is established and full operations and maintenance concepts have been determined. More on the problems encountered in this area will be discussed in the next section.

The Lead Field Activity Project Team Manager is normally responsible for writing the contract statements of work under the guidance of the Program Manager and establishes liaison with the contracting organization to facilitate advertising, negotiating, and awarding the contracts. The Procurement Contracting Officer for these programs is not usually in the same area as the Program Management Office. For example, in the event that NWC, China Lake, California is assigned as the Lead Field Activity, the Navy Regional Procurement Office, Long Beach, California, will assign the Procurement Contracting Officer for the development program.

Test and Evaluation

The test and evaluation for a program consists of Development Test and Evaluation (DT&E) and Operational Test and Evaluation (OT&E) as

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[6]DODD 5000.28, "Design to Cost", 23 May 1975

dictated by OPNAV Instruction 3960.10[7]. DT&E is conducted to determine if engineering design and development are satisfactory, design risks have been minimized, the system meets technical specifications, and is capable of meeting operational requirements. These tests are normally performed at participating field activities using government personnel. OT&E is conducted to estimate the weapon system's operational effectiveness, and operational suitability, and to identify any operational deficiencies or need for modification. These tests are conducted for the Navy under the auspices of Commander Operational Test and Evaluation Forces (COMOPTEVFOR). T&E is conducted in three phases leading to the first major production decision. DT/OT I is conducted in the Conceptual Phase, DT/OT II in the Validation and Demonstration Phase, and DT/OT III in the Full-Scale Engineering Phase. The Operational Evaluation (OPEVAL) is conducted in OT III using pilot production hardware. Satisfactory completion of the OPEVAL is normally required for an Approval for Service Use[8] and a Release for Production[9].

The preceding situations and parameters affecting a less-than-major program in the conventional weapons field are neither all-inclusive nor treated in the depth that a program manager or deputy program manager will have to enter into but rather provides an overview for consideration.

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[7]OPNAVINST 3960.10, "Test and Evaluation," 22 Oct 1975

[8]OPNAVINST 4720.9D, "Approval of Systems and Equipment for Service Use," 23 Aug 1974

[9]NAVAIRINST 4200.12, "Release for Production of Systems, Weapons and Equipment; policy, responsibilities and procedures for," 12 Apr 1968

The next section will delve into problem areas and situations requiring close scrutiny.

SECTION IV

PROBLEM AREAS

As with any program, large or small, a number of potential problem areas do exist. A number of potential problem areas have been selected as a media for less-than-major program managers to consider for application. The areas discussed below are by no means considered to cover all areas of concern. Some areas discussed may apply to a broad spectrum of programs, while others are more applicable to conventional weapons programs.

Personnel and Staffing

The structure, number of personnel assigned, skills involved, and organization of the PMO depends greatly on the size, complexity, visibility, and funds available to the individual project. Nevertheless, care must be taken in order to insure that sufficient personnel are assigned to the project to allow management and control to be handled in sufficient depth. A compromise and balance of the aforementioned factors is necessary in order to determine the proper amount of decentralization of management from the PMO to the Lead Field Activity. While most of the technical management of the projects considered was handled by the field activities, the responsibility for budget justification, schedule control, and adherence to or trade-off of system performance specifications will likely remain at the headquarters activity in the program management office. This is neither a small task nor one to be taken lightly. Sufficient permanently assigned personnel must be made available in order to maintain

continuity and corporate memory for these continuing tasks.

It is the opinion of the author that at least two areas are lacking in personnel assignment. The first concerns the training and experience prerequisites of the deputy program managers. Current official manpower descriptions for the military billets, which provide for the deputy program managers, neither identify them as such nor do they dictate background and experience in weapons systems acquisition management. The Navy is developing a community of professionally trained officers for assignment to managerial tasks in the Weapons Systems Acquisition Management (WSAM) field.[10] The career development of these officers is achieved through assignment to experience-qualifying billets in the project management support structure and through education and training. This education may be acquired by attendance at courses such as conducted at Defense Systems Management College or the Naval Postgraduate School, Monterey, California. A subspecialty code is assigned these officers upon graduation. Biennial selection boards review records of officers who have management and/or technical-oriented background in this field and selects those who have demonstrated superior performance as "Proven Subspecialists."

The second area relates to the field of cost analysis. While a functional capability exists in the Evaluation Division (AIR-506), Acquisition Pricing Branch of the Material Acquisition Group, this group is primarily staffed and trained in aircraft and missile funding analysis.

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[10]BUPERS Instruction 1040.2A, "Officer Weapons Systems Acquisition Management (WSAM) Program", 5 Apr 1976

This leaves the Armament Division to provide its own cost analyses for the commodities under its cognizance either within its own resources or by the use of the field activities. Most cost estimates for research and development programs are developed by the lead field activity. However, this leaves the PMO with little or no capability for analysis and verification of these cost estimates. Development of such a capability would allow greater insight into the basis of cost estimates provided by outside sources as well as lending credibility to budget requests.

Management Information Systems

The prior section discussed the MK III Project Management Information System in use at Naval Weapons Center, China Lake, California. This style of computerized schedule management system is but one link in the chain which would comprise an entire program management office management information system. Such a system, not necessarily computerized, would include such areas as a full status and projection system for cost elements of the program, status of training, publications and other documentation, historical information, and logistics information. A dependence on an outside agency such as a field activity to provide the full spectrum of such information should be considered with caution. For example, a single activity may not have control over all elements of the program and therefore the data must be transferred to this activity. Physical separation of the headquarters and the field activity causes delay in transmittal and receipt of processed information. Additionally, there is always the risk that some data will be missed in the changing of hands.

The problem is compounded for a small program office in that any management information system requires personnel to establish it, maintain the data base, analyze the information it provides, and insure that the proper persons are made aware of the implications of the information.

Interface with Other Agencies

Most research and development programs require considerable interface with agencies and activities other than the parent command. In this section, a few of these interface areas which are important to the weapons/munitions program manager will be discussed briefly.

The first area concerns explosive safety. Navy explosive weapons, prior to approval for service use, must be evaluated by the Weapon System Explosives Safety Review Board[11]. This board is composed of representatives of all the Material Systems Commands and is chartered to review the explosive safety of weapon systems and to make recommendations for approval or changes in the system in these terms. The chairman of this board is currently assigned from the Naval Sea Systems Command, Washington, D. C., and operates under the procedures contained in NAVSEA Instruction 8020.6[12]. For systems approaching the end of the Full-Scale Engineering Development Phase, a liaison with this group will bring out areas of concern and establish an understanding of the system in a timeframe to allow for resolution of problem areas, acquisition of necessary supporting data, and make for a smoother transition through this key milestone.

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[11]NAVMATINST 8020.1D, "Naval Explosives Safety Program," of 12 Jan 1971

[12]NAVSEAINST 8020.6, "Naval Explosives Safety Program; responsibilities, policies, and procedures for," 27 May 1976

An area which has only recently become a matter for concern to the Armament Program Manager is that related to the Single Manager for Conventional Ammunition. The U. S. Army was assigned cognizance of a considerable portion of the services ammunition[13]. The Single Manager task has been further assigned to the U. S. Army Armament Materiel Readiness Command (ARRCOM), Rock Island, Illinois. Designated ammunition which has been approved for service use and released for full production is assigned to the Army for acquisition and wholesale stock control. There is a possibility that later phases of implementation of this concept may expand the range of items assigned and expand Army ownership to some retail stock activities. A Transition Plan, developed during Full-Scale Engineering Development, is required to be jointly written and approved by the Services for an orderly turnover of production and stock control to the Army's Single Manager. Little experience is available in this area and will require considerable planning by the program manager to avert delays or an ineffective transition.

The National Environmental Policy Act of 1969 requires that all Federal actions be environmentally evaluated. This brings a new dimension to the program manager of a new system. These environmental evaluations may be informal or formal depending on the specific situations[14].

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[13]DODD 5160.65, "Single Manager Assignment for Conventional Ammunition," 26 Nov 1975

[14]OPNAVINST 6240.2D, "The National Environmental Policy Act and Environmental Impact Statements; policy regarding an assignment of responsibilities for," 1 Apr 1974.

An environmental assessment may indicate the need for filing an Environmental Impact Statement. A document of this nature may have far reaching implications within the Services, the Department of Defense, various Federal government agencies, and state/local governments. The interest of non-government special interest groups may likely be aroused, causing concern and possible delay in testing, and creating a regime that the program manager has not previously had occasion to become a participant in. This highly visible area cannot be ignored and early planning for the contingencies which may be encountered will pay high dividends.

Multiple Service Programs

Multiple and joint service development programs present a new dimension for the program manager to consider. While joint service instructions[15] provide for the procedures of the executive service to be used in a multi-service program, there is considerable tailoring that must be used in order that all the participants be able to mutually assist in the program. Each service is likely to retain some visage of parochialism in their view towards the methods of management, technical performance, and the approach to cost control. Situations which may become areas for disagreement and concern include test requirements, source selection, and funding of service-peculiar requirements.

Test and evaluation planning is outlined in detail in a Test and Evaluation Master Plan (TEMP). While the management of test and evalua-

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[15]AFSC/AFLCR 800-2, NAVMATINST 5000.10A, AMCR 70-59, "Management of Multi-Service Systems, Programs and Projects," 4 Sept 1973

tion is the responsibility of the executive service, problems have arisen concerning peculiar test requirements of the participating service. These requirements have sometimes resulted in the participating service writing a TEMP for those items. Another situation concerns testing which could logically be physically performed by either service. There is a recent trend to the use of Joint Test and Evaluation Master Plans (JTEMP) which contain the requirements of all participants and allows a clearer view to the complete test program. Sharing of test facilities and other resources can be seen more clearly in such a plan. This style plan does require more coordination and planning between the services in order to be all-inclusive. Another advantage is that it can be viewed at the OSD level as a fully comprehensive document.

Although most service-peculiar requirements are identified in the Joint Development Plan (JDP), disagreements may arise from time to time as to whether a certain requirement or test falls within the area defined in the JDP. Situations may arise that were not known or considered in the JDP which will require resolution. The solutions to these situations must be viewed by the program manager in terms of the impact on cost and schedule. Careful thought and planning is necessary at the earliest stage in order to minimize these impacts on the program.

Integration of Support Requirements

A number of problems may arise concerning the integration of system support. Discussed in this section are potential problems in ground support equipment, packaging, transportation documentation, and storage compatibility.

The management of ground support equipment (GSE) in the Naval Air Systems Command is under the cognizance of the Director, Ground Support Equipment Division (AIR-534) who is designated as the Program Manager for Ground Support Equipment[16]. As such he is responsible to provide for all ground equipment required to maintain, service, handle, test or operate a system including specialized as well as equipment common to more than one system. This definition will include packaging and containerization of the weapon, documentation concerning packing and unpacking, fleet issue unit loads, and truck and rail car loading plans. Due to constraints on headquarters personnel ceilings and workload, the Naval Air Engineering Center (NAEC), Lakehurst, New Jersey, has been designated as a Deputy Program Manager for GSE. A majority of the engineering and design effort in these areas is actually performed at the Naval Weapons Handling Center (NWHC), Earle, New Jersey. This requires that the GSE division support the Armament Program Manager functionally but also requires that NAEC be funded from program funds for management effort as the Deputy Program Manager for GSE as well as funding for efforts by NWHC. Due to the peculiar interface involved, these efforts have been arranged and coordinated by the Program Management Office rather than under the Lead Field Activity. Aircraft compatibility testing of handling equipment is normally conducted by the Naval Air Test Center, Patuxent River, Maryland bringing yet another activity

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[16]NAVAIRINST 5400.18, "Program Manager for Ground Support Equipment; establishment of," 6 Jul 1967.

into the loop for coordination, monitoring, and funding.

Another concern is that of ship's compatibility and storage of the weapons. These areas fall under the purview of the Ship Installations Division (AIR-537). Since installations aboard ships and handling equipment are closely related there is considerable interface and overlap in these areas. Major concerns by the Ship Installations Division are such items as magazine availability, compatibility of the weapon system with magazine configuration, damage control mechanisms, Improved Rearming Rate Program compatibility, strike up/strike down flow from magazine to assembly areas, weapons elevators and finally to staging areas preparatory to aircraft loading. An additional situation is that of compatibility with Underway Replenishment (UNREP) rigging and with Vertical Replenishment (VERTREP) handling equipment.

All these areas have presented problems with past systems. Extremely close coordination, detailed planning, and monitoring are required in the aforementioned areas. The funding required in these and other support areas must be planned and negotiated with the responsible activities. Both the time required to accomplish these tasks as well as the costs are negotiable, but are likely to run higher than that which might have been envisioned prior to the negotiation. The program manager would be well advised to consider these areas as early as possible in the development phase of the weapon system.

SECTION V

CONCLUSIONS AND RECOMMENDATIONS

Many of the potential problems and areas of concern discussed in the previous sections are a function of long range and in-depth planning, close coordination, and resolution of the interface regions. The large number of different functional activities both in headquarters and in the field, coupled with activities of other Navy commands, other Service commands, OSD, other non-DOD Federal agencies, and state as well as non-governmental groups presents a formidable liaison task for even large, well-staffed projects. This task is nearly overwhelming for the program manager of small staff, "lean-matrix" style of program management offices characteristic of Navy less-than-major programs.

Instructions, regulations, and guidance for major projects cover at least in overview, if not in detail, a multiplicity of situations. While it may be said that these regulations narrow the latitude of techniques and options for the project manager of a major system, these regulations are, in many cases, neither mandatory or appropriate for a less-than-major program. The problem that may confront the program manager of the less-than-major program is that without written guidance, a lesser experience in similar situations, and a smaller base of corporate knowledge on which to draw, he may be faced with taking greater risk in decision-making than would otherwise be necessary.

In specific areas relating to the Navy Armament Program Management Office, the following recommendations are made:

a. That the military Deputy Program Manager billets be so identified in the Officer Manpower Authorization and that the requisite training and experience be provided for officers detailed to those billets.

b. That a capability be established in the Armament Division for cost analysis of research and development armament programs. The capability established in support of "intensified" program management could also be applied to other programs within the division as well as to cost estimates related to production commodities.

c. That a management information system be developed for use of the program management teams involved in "intensified" program management. Portions of such a management information system may be found useful by both the management and analysis personnel and the engineering management branches of the division for tracking and analysis within their commodity areas or field of support. A simplified information retrieval system could also have the added advantage of reduced filing space and associated costs along with lessened research time for engineers and managers for information contained in those files.

APPENDIX A

LIST OF ACRONYMS

AFTEC	Air Force Test and Evaluation Center
AFSC	Air Force Systems Command
AFLC	Air Force Logistics Command
AMRAD	Air Munitions Requirements and Development Committee (DOD)
ARRCOM	Armament Materiel Readiness Command (Army)
ASU	Approval for Service Use
BUPERS	Bureau of Naval Personnel
CNO	Chief of Naval Operations
COMOPTEVFOR	Commander Operational Test and Evaluation Forces (Navy)
CSAF	Chief of Staff, U. S. Air Force
DCP	Decision Coordinating Paper
DOD	Department of Defense
DODD	Department of Defense Directive
DPM	Deputy Program Manager
DSARC	Defense Systems Acquisition Review Council
DTC	Design to Cost
DT&E	Development Test and Evaluation
FYDP	Five Year Defense Plan
GSE	Ground Support Equipment
JDP	Joint Development Plan
JDRP	Joint Development Review Panel
JTEMP	Joint Test and Evaluation Master Plan

LCC	Life Cycle Cost
LFA	Lead Field Activity
MENS	Mission Element Need Statement
MIPR	Military Inter-Departmental Purchase Request
NAEC	Naval Air Engineering Center
NAVAIR/NAVAIRSYSCOM	Naval Air Systems Command
NAVMAT	Naval Material Command
NAVSEA	Naval Sea Systems Command
NWHC	Naval Weapons Handling Center
OPEVAL	Operational Evaluation
OPNAV	Office of the Chief of Naval Operations
OT&E	Operational Test and Evaluation
PBD	Program Budget Decision
PFA	Participating Field Activity
PMO	Program Management Office
SECNAV	Secretary of the Navy
SISMS	Standardized Integrated Support Management System
SPO	Systems Program Office
T&E	Test and Evaluation
TAC	Tactical Air Command (Air Force)
TAWC	Tactical Air Warfare Center (Air Force)
TEMP	Test and Evaluation Master Plan
TFWC	Tactical Fighter Weapons Center (Air Force)
UNREP	Underway Replenishment
VERTREP	Vertical Replenishment

WSAM Weapons Systems Acquisition Management

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