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**Developing an Acquisition Strategy for the Colombian Navy's
New Strategic Surface Ships**

By: Orlando A. Cubillos Chacón

June 2007

**Advisors: Rene Rendon
Jeffrey Cuskey**

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NAVY'S NEW STRATEGIC SURFACE SHIPS**

Orlando A. Cubillos Chacón-Lieutenant Commander, Colombian Navy

Submitted in partial fulfillment of the requirements for the degree of

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June 2007

Author:

Orlando A. Cubillos Chacón

Approved by:

Rene Rendón, Lead Advisor

Jeffrey Cuskey, Support Advisor

Robert N. Beck, Dean
Graduate School of Business and Public Policy

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DEVELOPING AN ACQUISITION STRATEGY FOR THE COLOMBIAN NAVY'S NEW STRATEGIC SURFACE SHIPS

ABSTRACT

The Colombian Navy is a modern, disciplined, and well-trained military service performing the constitutional mission to defend the integrity of the Colombian maritime territory and enforce government policies concerning the use of the sea. Today the strategic fleet fulfilling these duties bears normal aging problems threatening the execution of the Colombian Navy's mission in the near future. The country's fiscal situation is tight and no funds are budgeted to support a contract acquiring new ships. The Colombian Navy will need to replace its strategic surface ships in order to upgrade its tactical capabilities to new technology. The most viable option is the acquisition of second-hand ships available on the international market. The U.S. defense acquisition system has been in place for almost sixty years and has proven its efficiency by providing defense systems to the U.S. military services; therefore, after conducting a comprehensive literature search and bibliographic review, the U.S. DoD acquisition strategy was the model selected for a proposed acquisition strategy suitable for the Colombian Navy's unique conditions,. The resulting product, recommendations, concerns, and areas of further research coincide with the need to develop a flexible and reliable acquisition system to face the future of progress within the Colombian Navy.

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I. INTRODUCTION

A. CHAPTER OVERVIEW

Colombia is a littoral state in possession of jurisdictional waters both in the Caribbean Sea and in the Pacific Ocean. The Colombian maritime territory approximately equals its land dimension at almost a million square kilometers. To effectuate sovereign control over its maritime territory, the nation has a modern, disciplined, and well-trained Navy to defend the integrity of the territory, enforce government policies concerning the use and exploitation of sea resources, preserve human life at sea, and deny the use of the sea to potential enemies. The extensive area of responsibility demands the utilization of different types of assets to guarantee the complete control of the tri-dimensional operational theater: sub-surface, surface, and aerial. Today the Colombian Navy's surface fleet bears the severe effects of the environmental conditions of the maritime atmosphere, the wearing process, and the limited budget for replacement programs for surface assets. The objective of this report is to compare the U.S. Department of Defense (DoD) acquisition system to the Colombian Navy acquisition strategy in order to identify suitable elements to help in developing an acquisition strategy for strategic ships for the Colombian Navy.

In order to arrange the fundamental questions and matters required to explore how to develop an acquisition strategy suitable for the Colombian Navy's new strategic ships, this chapter will cover the background, problem statement, purpose of study, research question, methodology, limitations, definitions, and significance of study.

B. BACKGROUND

The Colombian Navy has four strategic surface ships, all built in Germany during the 1980s. The hulls and superstructures bear natural material fatigue and the combat systems need to be upgraded. Eight years ago an overhauling process was performed on the ships but lately some of the main engineering systems in all units began to fail,

requiring increased emergency budget additions to uphold operational capability. As a component of the Armed Forces, the Colombian Navy is engaged in the government's Democratic Security and National Defense Policy to defeat the narcoterrorist threat in order to reestablish territorial control and bring peace and prosperity to the country as mandated by the National Constitution. Besides its role in the war against narcoterrorist organizations, the Navy performs other common duties needed to uphold the maritime power of the nation. The challenge today is to define an acquisition strategy to guarantee the replacement of the existing strategic ships in a period when the defense budgetary effort is oriented toward increasing Colombian Army and Marine Corps capabilities.

C. PROBLEM STATEMENT

A rough estimate of the life expectancy of the current strategic ships establishes between 10 to 15 years at less than 30 percent of their tactical capabilities. Today there are no funds appropriated or budgeted to support a contract to acquire new ships. Last year, the Colombian Congress approved a tax reform in order to raise money to increase the support to military forces within the government's security and defense policy. Based on the collection of those resources, the Colombian Navy has initiated a four-year plan to maintain and upgrade some of the tactical capabilities of the strategic fleet, Coast Guard, and Marine Corps. The present maintenance plan will solve a short-term need but the Colombian Navy will still need to acquire new strategic ships to maintain the regional sea power balance.

Today, Colombian public opinion is also supportive of finding a resolution to the country's security problems, which have affected its development for more than forty years. Nevertheless, the general public does not understand the role of the Colombian Navy in the campaign to defeat the country's enemies. The economic environment is not favorable for addressing an acquisition program for new ships and, given the elevated costs of naval equipment purchases, easily winning approval from the executive planners to fund any such acquisition is improbable.

The Colombian Navy will need to replace its strategic surface ships within the next decade in order to upgrade to new technology and enhance the operational capabilities of its assets. In order to do so, a viable acquisition strategy for new strategic ships must be proposed today so that the Navy will be prepared for the moment when economic resources and political support coincide.

D. PURPOSE OF THE STUDY

The purpose of this report is to develop a suitable strategy for the Colombian Navy to acquire new strategic surface ships. The acquisition strategy will use elements from the U.S. DoD's acquisition system as documented in DoD directives.

DoD Directive 5000.1 and DoD Instruction 5000.2 define the activities and procedures related to the acquisition process for the military services in the U.S. The U.S. Navy, as a component of the DoD, must apply these regulations for the acquisition of ships and ships' systems. The Colombian Navy has few experiences in the procurement of ships and ships' systems, given its budgetary restrictions and the infrequency of acquisitions. The purpose of this report is to develop an acquisition strategy for the replacement of the existing strategic ships using suitable concepts from the U.S. acquisition process, given the present Colombian environment.

E. RESEARCH QUESTIONS

The following questions will be addressed on this report:

- Which aspects of the U.S. DoD acquisition process are applicable to the Colombian Navy's acquisition strategy for new strategic surface ships?
- What other aspects must be considered in the acquisition strategy for new strategic surface ships in Colombia?

F. METHODOLOGY

The methodology chosen for the completion of this report is the case study, as suggested by Leedy and Ormrod in their book, *Practical Research*, "...in case study the researcher collects extensive data on the individual(s), programs(s), or event(s) on which

the investigation is focused. These data often include observations, interviews, documents...”¹ Therefore, a comprehensive literature search and review of thesis reports, government reports and U.S. DoD regulations on acquisition processes will be conducted as knowledge foundation.

G. LIMITATIONS

The amount of information available from the U.S. DoD acquisition system is enormous; the actions of the different key players within the system has led to a very broad amount of data and sources ranging from books, magazines, periodicals, websites, federal regulations, and executive orders. However, to keep the scope of this report in proportion, only the main and generalized documentation will be considered.

The Colombian Navy acquires strategic ships much less frequently than the U.S. Navy and it has typically acquired non-developmental items from European countries, such as Germany and Sweden. The surface units of the Coast Guard and auxiliary fleet are mostly second-hand purchases, also from the U.S. and Europe. This presents a serious limitation when comparing information about the acquisitions systems for both navies.

H. DEFINITIONS

To give the reader a clear understanding of some of the terms continuously used in this report, the technical definitions from the Glossary of Defense Acquisition Acronyms and terms² are cited below:

Acquisition: The conceptualization, initiation, design, development, test, contracting, production, deployment, Logistics Support (LS), modification, and disposal of weapons and other systems, supplies, or services (including construction) to satisfy DoD needs, intended for use in, or in support of, military missions.

¹ P. Leedy, J. Ormrod, *Practical Research – Planning and Design*, eighth edition, Pearson Prentice Hall, Columbus, OH, 2005, p. 135.

² Defense Acquisition University, *Glossary of Defense Acquisition Acronyms and Terms*, twelfth edition, Defense Acquisition University Press, Fort Belvoir, VA, 2003.

Acquisition Management: Management of any or all of the activities within the broad spectrum of “acquisition,” as defined above. Also includes training of the defense acquisition workforce and activities in support of the Planning, Programming, Budgeting and Execution (PPBE) Process for defense acquisition systems/programs. For acquisition programs this term is synonymous with program management.

Acquisition Planning: The process by which the efforts of all personnel responsible for an acquisition are coordinated and integrated through a comprehensive plan for fulfilling the agency need in a timely manner and at a reasonable cost. It is performed throughout the life-cycle and includes developing an overall acquisition strategy for managing the acquisition and a written Acquisition Plan (AP).

Acquisition Strategy: A business and technical management approach designed to achieve program objectives within the resource constraints imposed. It is the framework for planning, directing, contracting for, and managing a program. It provides a master schedule for research, development, test, production, fielding, modification, postproduction management, and other activities essential for program success. The acquisition strategy is the basis for formulating functional plans and strategies (e.g., Test and Evaluation Master Plan (TEMP), Acquisition Plan (AP), competition, systems engineering, etc.) See Acquisition Plan.

I. SIGNIFICANCE OF THE STUDY

This report’s significance is to contribute to the assembly and development of an acquisition strategy suitable for the Colombian Navy’s new strategic ships, based on the valuable elements taken from the U.S. DoD defense acquisition system and the Colombian Navy acquisition process. The conclusions and recommendations derived from this report will be presented for assessment by the Colombian Navy’s leadership and to be integrated in future planning for acquisition of strategic ships when the economic and political environments present favorable conditions.

J. CHAPTER SUMMARY

This chapter discussed the fundamental questions and matters required to explore how to develop an acquisition strategy suitable for the Colombian Navy's new strategic ships. Stating the background, problem statement, purpose of study, research question, methodology, limitations, definitions, and significance of study, a clear framework of the purpose and objective of this report was presented to build the development of the next chapters on these principles. The next chapter will address the literature review on three main topics: acquisition management, acquisition planning, and acquisition strategy.

II. LITERATURE REVIEW

A. CHAPTER OVERVIEW

This chapter provides relevant information regarding components of the U.S. defense acquisition system: acquisition management, acquisition planning, and acquisition strategy. In order to gain a clear understanding of how the system works, a comprehensive examination of documentation and guidelines will be conducted to support future analysis and for comparison with the Colombian Navy's acquisition process in Chapter IV. Given the extensive amount of data available and its complexity in certain areas, only the most relevant and key documentation will be considered to keep the scope of this research paper narrow.

“The primary objective of Defense acquisition is to acquire quality products that satisfy user needs with measurable improvements to mission capability and operational support, in a timely manner, and at a fair and reasonable price.”³ The Defense Acquisition University presents a definition that is simple and concise, but when facing the day-to-day details of the acquisition process, multiple questions arise: Is the projected system going to satisfy the primary user need? Are the people involved in the process interpreting properly the war fighter's needs? How timely, really, is the projected deployment of the system in relation to the operational requirement? What is the trade-off between the reasonable price and the best quality available? The U.S. defense acquisition system is a very complex process that demands the integration of diverse layers and components of the federal government into a coordinated application of the principles illustrated above: quality, continuous improvement, opportunity, and economy.

The national security strategy of any nation relies essentially on its military capability to deter potential enemies, influence the military balance of power with contradictory nations, and the achievement of its political objectives through the threat of

³ Defense Acquisition Policy Center (2007). Defense Acquisition Process Tutorial. Retrieved 22 March 2007 from <http://dod5000.dau.mil/TUTORIAL/index.htm>.

projected military power. Clausewitz defines war as, “not merely a political act, but also a real political instrument, a continuation of political commerce, a carrying out of the same by other means. All beyond this which is strictly peculiar to War relates merely to the peculiar nature of the means which it uses”.⁴ The end of the Cold War and the events signaling the beginning of the new era of international terrorism brought a new reality, where the enemy took the initiative, compelling the affected nations to revise their whole defense strategies and the defense acquisition system to provide the military with new tools to face the threat. McCaffery and Jones described precisely the new reality: “In sum, threat drives the budget, but antecedent to this is foreign policy and threat definition. Good foreign policy can reduce threats or cause them to disappear, through treaties and alliances, but diplomats know that diplomacy without the threat of the force and the ability to project power is useless.”⁵

B. DOD ACQUISITION MANAGEMENT

In an environment where the defense budget shrinks year after year and the general public’s support of defense programs is undermined by the political composition of the country’s leadership institutions, concepts like management, as described by George Perino in the following paragraph, gain relevance:

Defense systems cost American taxpayers billions of dollars. These programs periodically undergo intense media scrutiny and political debate. The resulting impact on individual acquisition programs can be chaotic. Effective management of defense system acquisition under these conditions clearly requires a high degree of technical, business, and political acumen. More important, it also requires an understanding of the demands that such complicating factors place on managerial activities.⁶

⁴ Carl Clausewitz, *On War*, Project Gutenberg Electronic Book, 2006.

⁵ Jerry McCaffery, L. Jones., *Budgeting and Financial Management for National Defense, A Volume in Research in Public Management*, LR Jones and Nancy C. Roberts, Monterey, CA, 2004 , p. 10.

⁶ George Perino, “Complexity: A Cognitive Barrier to Defense Systems Acquisition Management,” *Acquisition Review Quarterly*, Winter 2001, Defense Acquisition University Press, Fort Belvoir, VA, 2001, p. 62.

The U.S. DoD uses a life-cycle approach for managing defense acquisition programs. According to the Defense Acquisition Guidebook, the defense acquisition management framework involves five distinctive phases: concept refinement, technology development, system development and demonstration, production and deployment, and operation and support. There also three different groups of the phases: pre-systems acquisition (concept refinement and technology development), system acquisition (system development and demonstration, production and deployment, and sustainment (operation and support)). There are also three decision points denoted as Milestones A, B, C, and three concept reviews points: concept decision, design readiness review, and full-rate production decision review. Figure 1 presents the whole system described above.

Key policies govern the defense acquisition system: flexibility, responsiveness, innovation, discipline, and streamlined and effective management.⁷

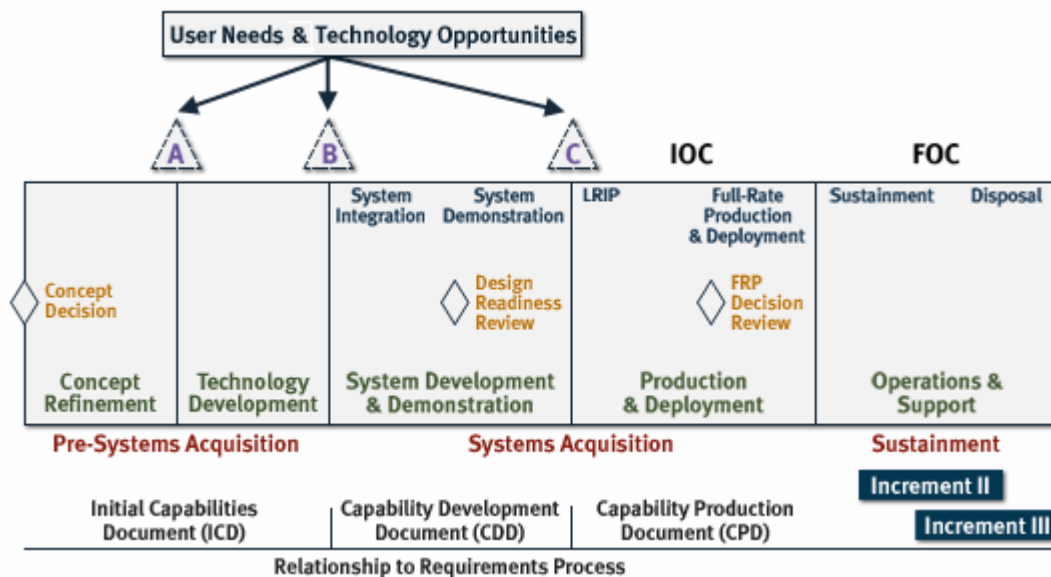


Figure 1. Defense Acquisition Management Framework.⁸

⁷ Defense Acquisition Policy Center (2007). Defense Acquisition Process Tutorial. Retrieved 22 March 2007 from <http://dod5000.dau.mil/TUTORIAL/index.htm>.

⁸ *Defense Acquisition Guidebook*, 2003, p. 4-2.

1. Major Players' Roles in the Defense Acquisition System

a. Executive Branch

The President: The United States Constitution specifies that the President is Commander-in-Chief of the armed forces.⁹ He also has the dual role of being both the head of state and head of the government, which entitles him with enough authority to influence directly the defense acquisition system in order to fulfill his duties and responsibilities. Events such as the terrorist attacks of 11 September 2001 (9/11) and the Global War on Terror (GWOT) have increased the relevance of those powers in the political arena.

The Office of Management and Budget (OMB): The OMB is the President's budget office and its role is to examine in detail the budgets for departments other than Department of Defense (DoD), looking for ways to reduce the expenditure; for defense programs the situation is very different. As McCaffery and Jones stated, "...OMB and the Office of Secretary of Defense (OSD) team up to review the defense budget, a process done in-house in the pentagon. Other domestic departments submit their budgets for review to OMB. When OMB cuts them, these agencies may appeal the actions to the president; the pattern is inverse in defense. If OMB wants to cut the budget, this first must be negotiated with the officials of the Office of Secretary of Defense (OSD)."¹⁰

National Security Council (NSC): Established in 1947 as part of the Executive Office of the President, the NSC is chaired by the President himself and its members are: the Vice President, Secretary of State, Secretary of the Treasury, Secretary of Defense, and the Assistant to the President for National Security Affairs. The Chairman of the Joint Chiefs of Staff acts as an advisor to the Council and the Director of National Intelligence acts as intelligence advisor. The Chief of Staff to the President,

⁹ Terry Jordan, *The U.S. Constitution and Other Fascinating Facts About It*, Oak Hill Publishing Company, Naperville, IL, 2004, p. 39.

¹⁰ Jerry McCaffery, L. Jones, *Budgeting and Financial Management for National Defense, A Volume in Research in Public Management*, LR Jones and Nancy C. Roberts, Monterey, CA, 2004, p. 5.

Counsel to the President, and the Assistant to the President for Economic Policy are always invited. The Attorney General, the Director of the OMB, and other heads from executive departments and agencies are invited when necessary.

The function of the NSC is stated as: “The National Security Council is the President’s principal forum for considering national security and foreign policy matters with his senior national security advisors and cabinet officials... The Council also serves as the President's principal arm for coordinating these policies among various government agencies.”¹¹

Department of Defense (DoD): The National Defense Act of 1947 created the unified structure from the previous War Department and Department of the Navy based on the lessons learned and the problems experienced during World War II regarding departmental priorities and precedence for the allocation of resources. Today, the Departments of the Army, Navy, and Air Force are the major organizations involved in the defense acquisition system. Within the DoD, other agencies play support and audit roles in the acquisition process: the Defense Contracting Management Agency (DCMA) and the Defense Contracting Audit Agency (DCAA). The description of the OSD’s roles and responsibilities as shown on DoD web page are: “Office of the Secretary of Defense (OSD) is the principal staff element of the Secretary of Defense in the exercise of policy development, planning, resource management, fiscal, and program evaluation responsibilities. OSD includes the immediate offices of the Secretary and Deputy Secretary of Defense, Under Secretaries of Defense, Director of Defense Research and Engineering, Assistant Secretaries of Defense, General Counsel, Director of Operational Test and Evaluation, Assistants to the Secretary of Defense, Director of Administration and Management, and such other staff offices as the Secretary establishes to assist in carrying out assigned responsibilities.”¹²

¹¹ The White House (2007) Retrieved 18 March 2007 from <http://www.whitehouse.gov/nsc>.

¹² United States Department of Defense (2007) Retrieved 20 March 2007 from <http://www.defenselink.mil/osd>.

b. Congress

Six different committees in the U.S. Congress oversee defense programs: the House and Senate Armed Forces Committees that authorize defense programs; the House and Senate Appropriation Committees that appropriate funds for defense programs; and, finally, two committees which set spending limits for national defense expenditures: the House and Senate Budget Committees. There are also two other committees with legislative authority over defense spending: the Congressional Budget Office (CBO) and the Government Accountability Office (GAO). “In February of every year, the administration submits the President’s budget to Congress. For the DoD, this budget culminates three years of work to justify the dollars needed for national defense. The budget goes to the House and Senate budget committees, which issue a Budget Resolution that provides the top line budget for DoD. The work of drafting the legislation needed to authorize and appropriate defense funds begins in the proper committees and subcommittees. The subcommittees hold hearings and then ‘markup’ the bill and send it to the full committee. The full committee will debate, amend and report out the bill to the entire House or Senate for its consideration. After the vote is taken by both houses, a conference committee is established to ‘iron out’ any differences. The bill is then returned to both houses and voted on a second time. If passed, the bill is sent to the President for his signature or, if he disapproves of the bill, for his veto.”¹³

c. Defense Industry

Composed of large, and some small, organizations, the defense industry exerts a major influence over the defense acquisition system. Kausal, Humily, Taylor, and Roller commented on this issue, “There are over 1,000 large contractors and small businesses who employ more than two million people to provide the services, equipment, and weapon systems needed by the military.”¹⁴ Large and small corporations and

¹³ Tony Kausal (Editor); Gertrug Humily; Trevor Taylor; Peter Roller; *A Comparison of the Defense Acquisition Systems of France, the United Kingdom, Germany, and the United States*, Defense Systems Management College Press, Fort Belvoir, VA, 1999, p. 4-9.

¹⁴ *Ibid.*, p. 5-3.

companies located across the country influence both national and local economies, which creates a symbiotic relationship with politicians and regional leaderships represented in Congress. Politicians need votes from taxpayers and are willing to receive economic support from defense industries. This “special interests” situation is described by Rosen as, “We have been assuming so far that citizens who seek to influence government policy can act only as individual voters. In fact, people with a common interest can exercise disproportionate power by acting together. The source of a group’s power might be that its members tend to have higher voter participation rates than the population as a whole. Alternatively, members might be willing to make campaign contributions and/or pay bribes. As an example, over \$950 million in campaign contributions were made during the House and Senate campaigns in 2002.”¹⁵

2. Legal Base of the Defense Acquisition System

According to the Defense Acquisition University in its publication, *Introduction to Defense Acquisition Management*, the defense acquisition system is supported in terms of the legal basis to perform its functions and objectives by two sources: public law and executive direction.”¹⁶ Congress and the executive branch are, respectively, the source of public laws and executive orders. Some examples of major acquisition actions are summarized here and in Figure 2 :

a. Public Law

- Small Business Act (1963)
- Office of Federal Procurement Policy Act (1983)
- Competition in Contracting Act (1984)
- Department of Defense Procurement Reform Act (1985)
- Department of Defense Reorganization Act of 1985 (Goldwater –Nichols)
- Government Performance and Results Act (1993)

¹⁵ Harvey Rosen, *Public Finance*, seventh edition, McGraw-Hill Irwin, New York, NY, 2005, p. 128.

¹⁶ Defense Acquisition University, *Introduction to Defense Acquisition Management*, sixth edition, Defense Acquisition University Press, Fort Belvoir, VA, 2003, p. 6.

- Federal Acquisition Streamlining Act of 1994
- Annual Authorization and Appropriations Legislation (annually).

b. Executive Direction

- Executive Order 12352 (1982).
- Federal Acquisition Regulation - FAR (1984)
- National Security Decision Directive 219 (1986)
- Executive Order 13101 (1998)
- Office of Management and Budget Circular A-11 (2002)

<p>Office of Federal Procurement Policy (OFPP) Act of 1983 Established a central office to define overall government contracting and acquisition policy and to oversee the system, among other things.</p> <p>Competition in Contracting Act (CICA) of 1984 Revised government policy to mandate competition and created an advocate for competition, the Competition Advocate General.</p> <p>DoD Procurement Reform Act 1985 Defense Procurement Reform Act established a uniform policy for technical data and created a method for resolving disputes.</p> <p>Defense Procurement Improvement Act of 1986 Provided policy on the costs contractors submitted to the Government for payment and on conflicts of interest involving former DoD officials.</p> <p>Defense Acquisition Improvement Act of 1986 Among other things, created the Under Secretary of Defense (Acquisition, Technology and Logistics).</p> <p>DoD Reorganization Act of 1986 (commonly referred to as Goldwater-Nichols Act) Among other items, revised the Joint Chiefs of Staff role in acquisition and requirements determination.</p> <p>Ethics Reform Act of 1989 As a result of the "Ill-wind" procurement scandal Congress mandated more stringent ethics laws.</p> <p>Defense Acquisition Workforce Improvement Act (DAWIA) of 1990 Mandated education, training and professional requirements for the defense acquisition corp.</p> <p>Federal Acquisition Streamlining Act (FASA) of 1994 Repealed earlier laws on acquisition, such as the Brooks Act provisions on computer acquisitions.</p> <p>Federal Acquisition Reform Act (FARA) of 1996 Revised procurement laws facilitate more efficient competition; included improving debriefings, limiting need for cost/pricing data and emphasizing price versus cost negotiations, among other items.</p> <p>Clinger-Cohen Act of 1996 Included changes to competition practices, commercial item acquisition, and included fundamental changes in how information technology equipment is purchased.</p>
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Figure 2. Major Acquisition Acts.¹⁷

¹⁷ Tony Kausal (Editor); Gertrug Humily; Trevor Taylor; Peter Roller; *A Comparison of the Defense Acquisition Systems of France, the United Kingdom, Germany, and the United States*, Defense Systems Management College Press, Fort Belvoir, VA, 1999, p. 5-10.

c. Acquisition Thrusts

Table 1 describes, according to the “Introduction to Defense Acquisition Management,”¹⁸ the major thrusts of the DoD acquisition system: alternative dispute resolution, advance concept technology demonstration, best value contracting, commercial items and practices, , integrated product teams and integrated product and process development, logistics transformation, open systems, price or cost as an independent variable, and performance-based services acquisition.

Table 1. DoD Acquisition Thrusts.

	Description
Alternative Dispute Resolution	Procedures such as conciliation, facilitation, mediation, fact-finding, arbitration and use of ombudsmen are valid instruments to facilitate the resolution of disputes between government and contractors.
Advanced Concept Technology Demonstration	Allows operational forces to experiment in the field with new technology to assess changes in doctrine, tactics or operational concepts, and training.
Best Value Contracting	Best overall value guides the contract awarding, not only cost but performance, quality, and schedule proposed.
Commercial Items and Practices	The use of commercial items is preferred because it enlarges the supplier base, takes advantage of the innovation in the commercial market, and grants access to the latest technology. Global competition and government/supplier partnerships are desired practices for contractors. Also quickly delivers mature technology to the field in useful increments in a progressive schedule, previously determined according resources and needs.
Integrated Product Teams and Integrated Product and Process Development	Promotes the synergy between key players within the acquisition process to obtain the best product in a timely manner.
Logistics Transformation	Integrated logistics chains to deliver agile and efficient support to the warfighter. Performance-based logistics is the goal of this new approach
Open Systems	Interoperability between services and allies defines the common requirements for defense systems’ interface standards
Price or Cost as an Independent Variable	Stakeholders participate in developing a strategy to acquire affordable systems based on cost-achievable objectives.
Performance-Based Services Acquisition	Results required are drivers to acquire services.

¹⁸ Defense Acquisition University, *Introduction to Defense Acquisition Management*, p. 16.

3. U.S. Defense Acquisition System Organizational Framework

National Security Decision Directive 219, signed under President Reagan's administration, summarized the recommendations made by the Packard Commission after assessing the performance of the defense acquisition system. In the assessment, the commission recommended the creation of a top-level executive in charge of the defense acquisition process: the Under Secretary of Defense (Acquisition, Technology, and Logistics) and a reporting chain for program managers of major defense acquisition programs. In 1989, the administration of President Bush performed a subsequent evaluation of defense acquisition, reinforcing the reporting chain concept in accordance with the size of the program assigned as an acquisition category (ACAT).

The relevance of this structure is described by the Defense Acquisition University in detail, "...this structure provides a clear line of authority, running from the Under Secretary of Defense (Acquisition, Technology and Logistics) (USD(AT&L)) through Component Acquisition Executives and Program Executive Officers to the individual program managers of ACAT ID programs. For ACAT IAM programs, the Assistant Secretary of Defense (Networks and Information Integration) (ASD(NII)), as well as the Department of Defense (DoD) Chief Information Officer, serves as the Milestone Decision Authority."¹⁹ The following are the description of the most relevant authorities within the defense acquisition system.

a. Program Executive Officers (PEOs)

PEOs are responsible for exercising supervision of a group of similar projects. In each service, there are six or more PEOs. Normally, PEOs are one- or two-star officers or a senior executive service civilian equivalent.

b. Component Acquisition Executives (CAEs)

The CAE is the senior official in each DoD component, the secretary of the military department, or the head of the DoD agency. This position is normally re-

¹⁹ Defense Acquisition University, *Introduction to Defense Acquisition Management*, p. 28.

delegated within the military departments to the assistant secretary level, denominating them Service Acquisition Executives (SAEs), reporting to the secretary administratively and to the USD(AT&L) with regard to acquisition managements issues.

c. Component Chief Information Officers

Personnel in the role of component chief information officer provide assistance and advice regarding the supervision and evaluation of automated information system acquisition programs to the CAE for each service.

d. Direct Reporting Program Managers

Generally, there are several one- or two-star officers or senior executive service civilian equivalents in each service who perform as program managers for sensitive programs reporting directly to the CAE.

e. Under Secretary of Defense (Acquisition Technology and Logistics)

The position of the USD(AT&L) is intended to be the principal staff assistant and advisor for the Secretary and Deputy Secretary of Defense concerning the main functions of the acquisition life-cycle and logistics support. In the acquisition chain, his precedence is above the secretaries of the military departments and he serves as a Defense Acquisition Executive. Among his tasks are the promulgation of defense acquisitions procedures and policies as well as regulations concerning the careers of and training for the acquisition workforce. He also serves as chair of the Defense Acquisition Board and is a milestone decision authority on ACAT ID programs. The subordinate staff elements to the USD(AT&L) are:

- Principal Deputy
- Director, Defense Research and Engineering
- Deputy Under Secretary of Defense for logistics materiel and readiness
- Assistant to the Secretary of Defense for Nuclear, Chemical, and Biological Defense Programs (ATSD(NBC)).

Many other officials and offices report to the USD(AT&L) or play an important role in the defense acquisition system but, given the scope of this report, those will not be included here.

f. Boards, Councils, and Groups

Defense Acquisition Board (DAB): The DAB advises the USD(AT&L) about complicated issues such as cost increases, schedule delays, and technical threshold gaps in relation to ACAT ID programs. The DAB keeps track of performance at each milestone and its reviews become a decision from the USD(AT&L).

Information Technology Acquisition Board (ITAB): The duty of the ITAB is to advise the ASD(NII)/DoD CIO regarding sensitive ACAT IAM programs or related areas. Its reviews also become a decisions from the USD(AT&L).

Joint Requirements Oversight Council (JROC): The JROC is responsible for developing procedures, policies, and determining joint warfighting capability needs. The JROC approves capabilities needed for ACAT I and ACAT IA programs. The Vice Chairman of the Joint Chief of Staff is the chairperson and the other assistant heads of the military services are members of this Council.

Cost Analysis Improvement Group (CAIG): The CAIG provides independent cost estimations of the life-cycle cost for ACAT I acquisition programs and develops continued improvements in cost estimation techniques and analysis.

C. DOD ACQUISITION PLANNING

DoD acquisition planning is regulated by OMB Circular A-109, Major Systems Acquisitions,²⁰ which establishes policies to be followed by executive branch agencies in the acquisition of major systems and by the Federal Acquisition Regulation (FAR),²¹ which is the primary source of instructions for federal agencies in their acquisition of

²⁰ AT&L Knowledge Sharing System (1976), Retrieved 8 May 2007 from <http://akss.dau.mil/docs/OMB%20Circular%20A-109.doc>.

²¹ FARSITE, Contracting Laboratory, (2005), Foreword, Retrieved 8 May 2007, http://farsite.hill.af.mil/reghtml/regs/far2afmcfars/fardfars/far/Foreword.htm#P0_0.

supplies and services with appropriated funds. The FAR is divided into 19 parts. Part 7 outlines acquisition planning definitions; policy; responsibilities; and general procedures to develop the acquisition plan, use government or commercial resources in the acquisition process, lease or purchase economic analysis, and other inherent government functions.

To develop the acquisition plan, the FAR defines acquisition streamlining as the process to design, develop, or produce quality systems using resources more efficiently and effectively, ensuring that only necessary and cost-effective requirements are included, and in a timely manner.²²

1. Policy and Agencies Responsibilities

The FAR states that all U.S. Federal Agencies are obligated to perform acquisition planning and market research for all acquisitions, promoting the use of commercial items and non-developmental items suitable to meet the need requirements. It also states principles of promoting full and open competition to the maximum extent practicable and working to integrate the personnel responsible in the acquisition process to satisfy the requirements of most effective, most economical, and most timely manner.²³

Each agency head must establish procedures to assure compliance in the following areas, according to the description found in the document mentioned above:

- Promote and facilitate full and open competition.
- Encourage supply of commercial item and non-development items.
- Establish thresholds and criteria to increase the detail and complexity of the planning process according to the cost and complexity of the systems and for waiving requirements because of urgency of the need and compressed delivery.
- Write plans on system, individual contract, or individual order basis.
- Designate planners for acquisitions.

²² FARSITE, Contracting Laboratory (2005), Subpart 7.1.

²³ FARSITE, Contracting Laboratory (2005), Subpart 7.102.

- Review, revise, approve, and standardize, and promulgate plan formats.
- Assure the contracting officer reviews the acquisition history and the fully detailed description of the supplies and services.
- Ensure compliance by the agency planners in matters related to use of the metric system, printing and writing papers, and environmental requirements.
- Ensure compliance with Electronic and Information Technology Accessibility Standards for documents related to the acquisition plan.
- Ensure before authorizing any purchase or contract that the service provided is not an inherently governmental function.
- Promote the use of the knowledge derived from prior acquisitions to refine requirements and acquisition strategies.

2. General Procedures

Acquisition planning is triggered by the identification of a need, preferably well in advance of the fiscal year in which the contract award or order placement is necessary. The designated planner must integrate a team composed of key personnel in the following areas: contracting, fiscal, legal, and technical issues related to the acquisition planning. A review of previous acquisition plans and discussion with people in charge of them, as well as a review and revision of the present plan, must be performed over periods of time no longer than one year.²⁴

Proactive actions, assisted by requirements and logistics personnel, must guide the determination of type, quality, quantity, and delivery requirements to avoid the issuance of unrealistic delivery or performance schedules. The planner must coordinate with experts in related areas to ensure compliance with the full and open competition and small business opportunities policies.

²⁴ FARSITE, Contracting Laboratory, (2005). Retrieved 8 May 2007 from http://farsite.hill.af.mil/reghtml/regs/far2afmcfars/fardfars/far/07.htm#P51_8035.

3. Written Plans

According to the FAR, in order to ensure the achievement of the acquisition objectives, the plan shall address management, technical, business, and other related considerations. The contents of the plan may vary according to particular circumstances and environmental conditions. The following are applicable instructions for developing the acquisition plan:

a. Acquisition Background and Objectives

This section presents eight components related to the background information and objectives to achieve with the acquisition plan:

- **Statement of the need:** The introduction of the plan is a brief statement of the need summarizing the technical and contractual history of the acquisition. Discuss feasible alternatives and its impact on previous acquisitions.
- **Applicable conditions:** State all significant conditions affecting the acquisitions in areas such as compatibility with systems and programs and cost, schedule, and capability constrains.
- **Cost:** Promulgate the cost goals and cost concepts for the acquisition defining if and how a life-cycle-cost model will be used and design-to-cost objectives.
- **Capability or performance:** Specify required capabilities, performance characteristics, and performance standards of the supplies or services to acquire.
- **Delivery or performance-period requirements:** Outline the basis for the delivery or performance period and explain the reasons for any urgency motivating anything other than full and open competition.
- **Trade-offs:** Discuss the expected consequences of trade-offs between cost, capability, performance, and schedule goals.
- **Risk:** Discuss cost, schedule, and technical risks and their consequences. Outline actions to prevent or minimize the negative effects. Consider the effects of concurrency of production and development.
- **Acquisition Streamlining:** If required by the agency, identify plans and procedures to encourage industry participation by any means, adjust cost effective requirements and promulgate a timeframe to identify mandatory specifications and standards.

b. Plan of Action

According to the FAR, the plan of action shall include the following elements:

- Sources: Indicate the possible sources of supplies and services that can meet the need, using government databases and other criteria to include the complete range of small business ownership. Identify the impact of any bundling affecting the participation of protected business.
- Competition: Describe mechanisms of promoting, sustaining, and overseeing full competition throughout the acquisition process at different levels or components of the system, at the spares and repairs level, and at the subcontracting extension level.
- Source selection procedures: Discuss the topics and processes related to source selection, submission dates, and timing for proposal evaluations.
- Acquisition considerations: Discuss contract-related matters like type of contract, contracting options, contracting methods, special clauses, special solicitations, FAR deviations, bidding or negotiations, equipment purchase or leasing, and performance-based acquisition use.
- Budgeting and funding: Explain how budget estimates were derived and discuss the schedule for obtaining adequate funds.
- Product and service description: Explain why products and services were selected to be used in the acquisition.
- Priorities, allocations and allotments: Methods for obtaining and using priorities, allocations, and allotments must be specified when urgency dictates short performance schedules or deliveries.
- Contractor vs. government performance: Apply OMB circular No. A-76.
- Management information requirements: Discuss management information systems to supervise contractor's effort. Use of the Earned Value Management System or other assessment tools must comply with federal regulations.
- Make or buy discussion: Analyze consideration given to make or buy programs.
- Test and evaluation: Describe the contractor and government test program for each of major phase or major system acquisition, addressing any concurrency event.

- Logistics considerations: Describe the assumptions determining contractor or agency support, maintenance and service throughout the life of the acquisition, warranties, reliability, maintainability, and quality assurance, requirements for contractor data and data purchase, and standardization concepts.
- Government-furnished property: Indicate any government property to be furnished to contractors, describing materiel and facilities.
- Government-furnished information: Discuss and indicate descriptions, controls, and procedures to provide any government information to prospectors and contractors.
- Environmental and energy conservation objectives: Discuss all the related issues regarding the environment and energy conservation objectives, requirements, impact statements, and proposed issues resolutions.
- Security considerations: Discuss security issues related to classified matters and information technology acquisitions. Also, discuss contractor access to facilities and federally controlled information systems.
- Contract administration: Describe how the contract will be administrated. Inspection and acceptance must be described for service contracts.
- Other considerations: Discuss standardization concepts, industrial readiness programs, the Defense Production Act, the Occupational Safety Health Act, foreign sales implications, and other aspects not covered before.
- The following are typical milestones for the acquisition cycle:²⁵
 - Acquisition Plan approval
 - Statement of work
 - Specifications
 - Data requirements
 - Completion of acquisition-package preparation
 - Purchase request
 - Justification and approval for other than full and open competition where applicable and/or any required D and F approval
 - Issuance of synopsis
 - Issuance solicitation
 - Evaluation of proposals, audits and field reports

²⁵ FARSITE, Contracting Laboratory, (2005). Retrieved 8 May 2007 from http://farsite.hill.af.mil/reghtml/regs/far2afmcfars/fardfars/far/07.htm#P51_8035.

- Contract preparation, review and clearance
- Contract award

c. *Additional Requirements for Major Systems*

As the FAR states, when regarding a major system development contract, the planner shall consider the incorporation of items currently available within the supply system of the agency responsible for the major system, the national supply systems, or items commercially available from more than one source. Items likely to be required in substantial quantities in the future must consider competitive acquisition strategies.

Also, for the solicitation of a major system production contract, planners shall consider that contractors include in their proposals the identification of opportunities allowing the government to acquire items in connection to the systems in substantial quantities in a competitive basis throughout the systems' usable life. The proposals shall include the provision for the government's right to use technical data provided under the contract for future acquisitions.

D. DOD ACQUISITION STRATEGY

The Defense Acquisition University defines the acquisition strategy as “a business and technical management approach designed to achieve program objectives within the resource constraints imposed. It is the framework for planning, directing, contracting for, and managing a program. It provides a master schedule for research, development, test, production, fielding, modification, postproduction management, and other activities essential for program success. The acquisition strategy is the basis for formulating functional plans and strategies (e.g., Test and Evaluation Master Plan (TEMP), Acquisition Plan (AP), competition, systems engineering, etc.).”²⁶

This definition frames a wide spectrum of management duties and responsibilities that the program manager and the program management team perform and for which they are accountable. As is desirable for any business organization, the goal is to satisfy the

²⁶ Defense Acquisition University, *Glossary of Defense Acquisition Acronyms and Terms*, twelfth edition, Defense Acquisition University Press, Fort Belvoir, VA, 2003, p. B-4.

identified need in a timely manner, reducing costs and minimizing time to accomplish the job through the understanding of the defense acquisition environment and the specific program's characteristics. The program manager's responsibility is to design and implement the acquisition strategy according to the specific conditions of the project and to the requirements of the decision authorities approving or coordinating the strategy. Authorities and the acquisition community must provide support and coordinated efforts to ensure the proper flow of the activities and stages within the process of developing an acquisition strategy.

Today's way of doing business in the Department of Defense is based on reforms and commercial business practices. This orientation allows the program manager the freedom to innovate and explore new routes to develop the acquisition strategy encouraging the use of commercial items, evolutionary acquisition strategies, the use of open systems, standard interfaces and more contractor involvement in life-cycle support.

The Department of Defense policy documents that provide guidance on the development of the acquisition strategy are:

- Department of Defense Directive (DoDD) 5000.1 – Defense Acquisition System.
- Department of Defense Directive (DoDI) 5000.2 – Operation of the Defense Acquisition System.

The formulation of a technology development strategy (TDS) encompassing the research and development to be put into operation occurs in the concept refinement phase prior to the technology development (TD) phase, when the configuration of the acquisition strategy has been put in place. The schedule to undertake the program objectives and constraints and the type of approach (i.e., evolutionary or single step) to full capability are outlined at this time. The denomination of the acquisition strategy varies in each service as follows:²⁷

²⁷ Defense Acquisition University, *Acquisition Strategy Guide*, fifth edition, Defense Acquisition University Press, Fort Belvoir, VA, 2003, p. 1-1.

- The Air Force’s program summary document, which contains the strategy, is called a Single Acquisition Management Plan (SAMP).
- The Army’s document is called a Modified Integrated Program Summary (MIPS).
- The Navy and Marine Corps use a Navy Master Acquisition Program Plan (MAPP).

As part of the review documentation process, the acquisition strategy development, execution, and approval is a function of the Milestone Decision Authority (MDA) at Milestone B, before the program initiation, and is a requirement for the issuance of the Acquisition Decision Memorandum to follow up the with the next acquisition phase.

The Defense Acquisition University’s *Acquisition Strategy Guide*,²⁸ also highlights the following benefits from the development of the acquisition strategy:

- Organized and consistent approach: Ensures that all relevant issues and multiple alternatives are in consideration and performs as a planning tool for the lifespan of the project.
- Decision aid: Keeping track of the evolution of the program at any given time, the acquisition strategy helps to integrate, prioritize, and evaluate many functional requirements of the project. Evaluation and approval of the acquisition strategy assists the program manager to assert all across the Acquisition Management System that the pattern followed is the best option to provide the capabilities that the warfighter needs.
- Means of achieving agreement: Building consensus between program manager and Milestone Decision Authority (MDA), the acquisition strategy plans activities required to accomplish the purpose of the program.
- Guide and baseline on rules/assumptions: Documenting the ground rules and assumptions involved in the program, the acquisition strategy records the evolution of the program, facilitating the evaluation of the program’s performance.

²⁸ Defense Acquisition University, *Acquisition Strategy Guide*, p. 1-1.

1. Acquisition Strategy Key Elements

According to the Defense Acquisition University's Acquisition Strategy Guide,²⁹ developing an acquisition strategy involves the observance of two groups of concepts: characteristics and critical elements.

a. Characteristics

- **Realism:** The strategic approach to the program objectives per se are reachable and can be implemented easily. Realistic programs will easily grant support and viability.
- **Stability:** The program is designed to minimize the negative effect of external or internal influences as changes in costs, schedule, or performance requirements.
- **Resource balance:** The major program objectives competing for resource assignments are held in equilibrium. The risk of unaccomplished objectives is approximately equal for all of them.
- **Flexibility:** Flexibility indicates the level of absorption of changes and failures that the program has and its impact in the overall performance. The preferred acquisition strategy for system development is the Evolutionary Acquisition (EA) and the preferred process within EA is Spiral Development.
- **Managed risk:** The identified uncertainties affecting performance, schedule, and cost are reasonably identified and corrective actions are designed to address the negative effect of them.

b. Critical Elements

- **Requirements:** The requirements of the need to be satisfied must be summarized addressing a family of systems or mission area requirements for interoperability. Documents include Initial Capabilities Document (ICD), Capability Development Document (CDD), and Capability Production Document (CPD).
- **Structure and Schedule:** Describe the relationship between acquisition phases, decision milestones, solicitations, contract award, systems engineering design reviews, contract deliveries, test and evaluation, production releases, and operational deployment objectives. Based on Defense Acquisition Management Framework.

²⁹ Defense Acquisition University, *Acquisition Strategy Guide*, p. 2-1.

- Acquisition Approach: Rationale must be provided about the selection of the acquisition approach: evolutionary or single step.
- Risk Management: How may the program be affected if any of the objectives are not achieved and how to address the situation.
- Program Management: Related to the use of any of the acquisition streamlining initiatives mentioned as Integrated Product and Processes Development (IPPD), Cost as Independent Variable (CAIV), and Horizontal Technology Integration (HTI).
- Design Considerations: The program manager must consider the following aspects: Technology Transition, Interoperability, Information Technology Supportability, Program Protection, and Information Assurance.
- Support Strategy: A support strategy for the life-cycle sustainment and continuous improvement must be designed by the program manager from the following: Performance-Based Logistics, Logistics Performance Criteria, and Product Support Integrator.
- Business Strategy: Full and open competition must be observed for the design of the acquisition strategy, fostering and building this issue into the development of the program. In addition, the PM must consider international and domestic sources, international cooperation, interoperability, and leasing options.
- Test and Evaluation: The strategy must address the approach to this topic in order to reduce the risk of the program to the minimum level.

2. Development and Documentation of the Acquisition Strategy

The process to translate operational needs and requirements using logical and systematic steps into a plan oriented and intended to organize a group of people working in the acquisition program to successfully achieve the mission is the first step toward developing an acquisition strategy. According to the acquisition literature, the process is described in its early stages as:

The program acquisition strategy originates as a Technology Development Strategy (TDS) during the Concept Refinement (CR) Phase of the acquisition cycle—prior to Milestone A and the Technology Development (TD) Phase. The TDS documents a strategy, which includes cost, schedule, and performance goals for the total research and development (R&D) part of the overall program acquisition strategy. The principles applicable to Integrated Product and Process Development (IPPD),

Integrated Product Teams (IPTs) and the reengineered acquisition oversight and review process will be utilized where it makes sense in TDS development.³⁰

Sometimes the development of the acquisition strategy begins even before the designation of a program manager and the subsequent formation of the program office. As a key document of the acquisition program after it is approved, the acquisition strategy is required to be updated at every milestone review. The program manager decides whether to develop the acquisition strategy as a single document or as a multipurpose document; this approach varies depending on the military service policy. Figure 3 portrays the acquisition strategy development process.

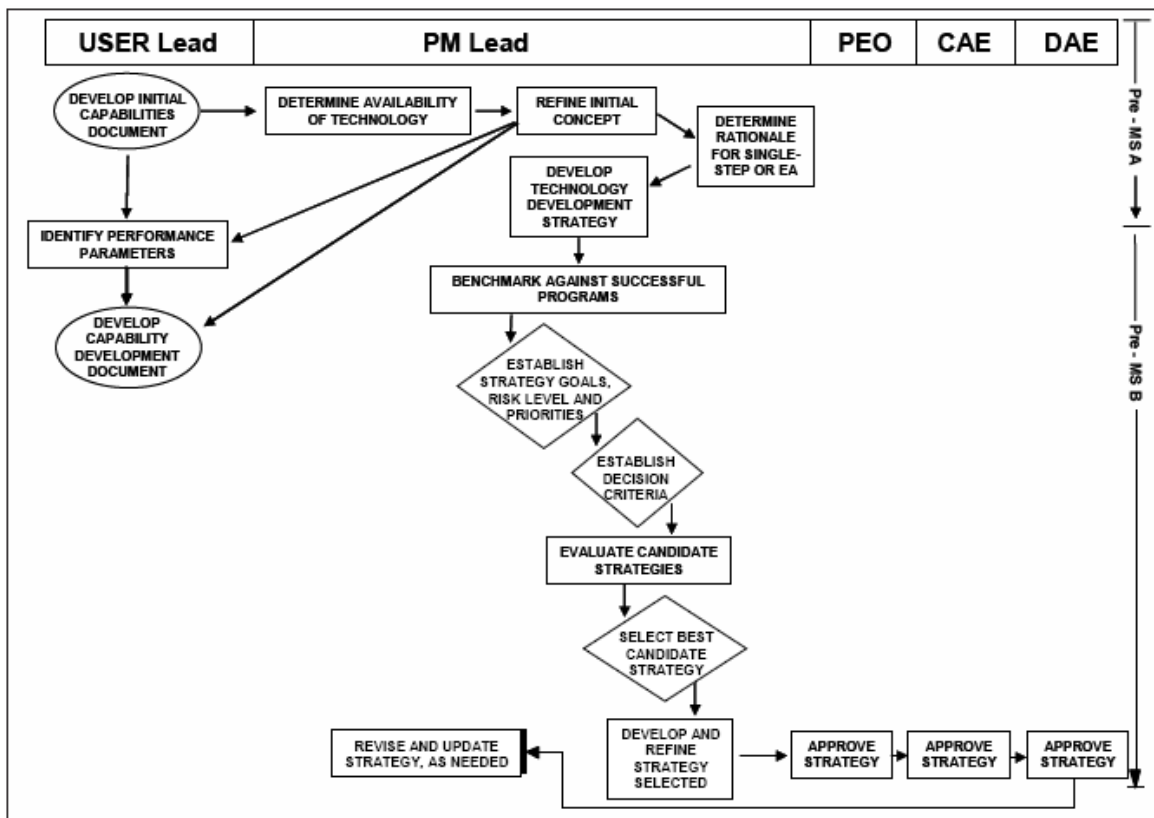


Figure 3. Acquisition Strategy Development Process.³¹

³⁰ Defense Acquisition University, *Acquisition Strategy Guide*, p. 3-1.

³¹ *Ibid.*, p. 3-2.

As mentioned, developing an acquisition strategy for approval requires following logical and systematic steps after first having a clear idea about the requirements or needs to be satisfied in order to explore all the possible approaches to reach the best solution in terms of cost and schedule.

Figure 4 presents one of the methods proposed to develop an acquisition strategy, where the sequential activities and action/authority levels are easy to follow. The program manager may use other methods, like software, to develop the acquisition strategy. Independently of the selected method for developing the acquisition strategy, the goal remains clear: satisfy a need or improve a system.

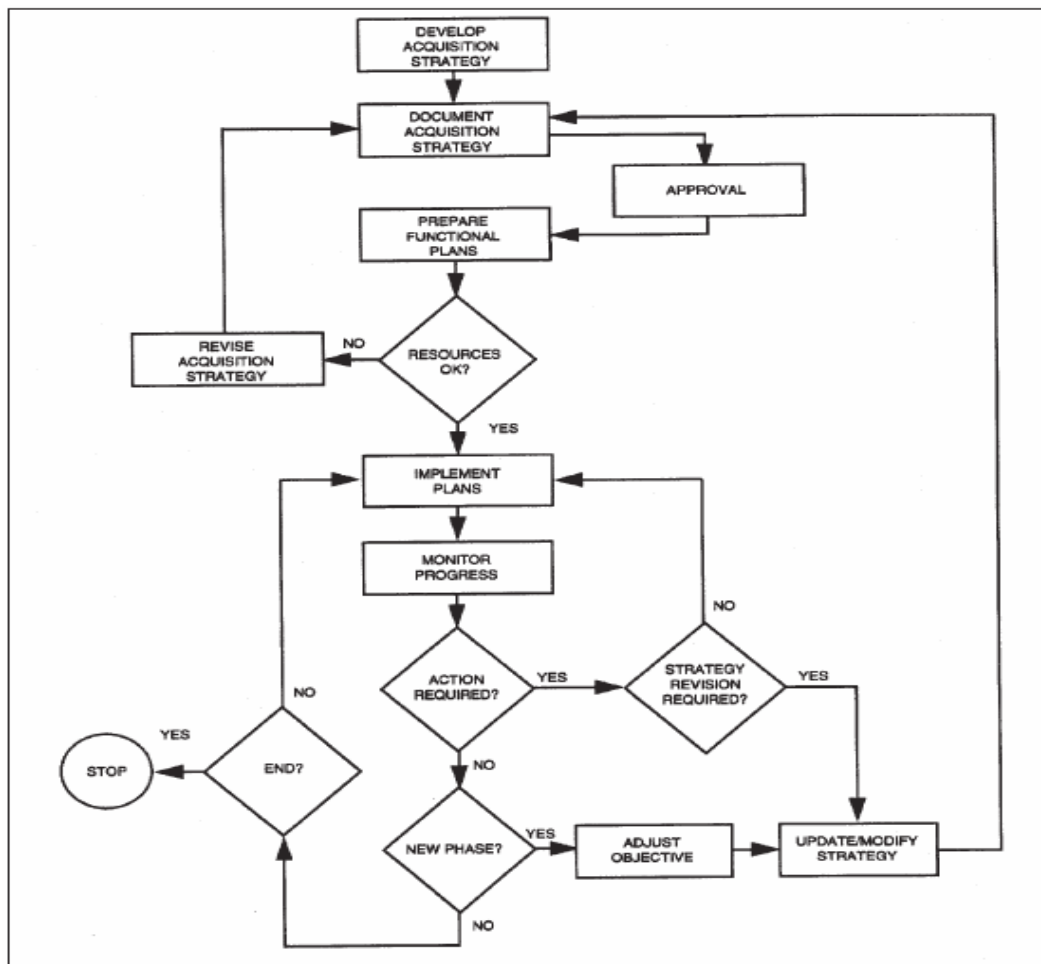


Figure 4. The Acquisition Strategy Development and Execution Process.³²

³² Defense Acquisition University, *Acquisition Strategy Guide*, p. 4-2.

The specific requirements and key elements for the acquisition strategy development process diagram are detailed in Table 2.

Table 2. Detailed Acquisition Strategy Development Process.

STEP	REQUIREMENTS	KEY ELEMENTS
ASSEMBLE STRATEGY DEVELOPMENT RESOURCES	PM must integrate all the resources under its control to achieve cohesion and effectiveness.	<ul style="list-style-type: none"> • Human resources required • Funding resources required • Information resources required • Time commitment required
ESTABLISH STRATEGY GOALS, RISK LEVELS, AND PRIORITIES	Situational realities and resource availability must be evaluated. Prioritization of program specific objectives or goals must be outlined. The level of difficulty and consequences of not achieving a specific goal must be evaluated. Initial risk levels should be developed.	<ul style="list-style-type: none"> • Program's timeline • Sources used in each acquisition phase • Type of contracts to be used • Contracts' award periods • Cost goals • Testing duration and intensity • Logistics support to be used • Software development approach • Initial technical, cost, schedule, and support risks of the system concept selected • Risk-mitigating options
ESTABLISH DECISION CRITERIA	PM must establish decision criteria for the application of the candidate strategies.	<ul style="list-style-type: none"> • Factors to use • Factors' weights • Commercial items, open systems, to use in selecting the best candidate strategy
IDENTIFY SPECIFIC CANDIDATE STRATEGIES	Mission needs and situational factors should drive the selection of the acquisition strategy. Refer to DoD 5000 documents for issues and alternatives applicable to acquisition strategy.	<ul style="list-style-type: none"> • Specific candidate strategies? • Level of satisfaction of the requirement • Combining milestones or phases schedule and documentation impact • Time estimates for conducting developmental and operational testing? • Candidate strategies' consideration of life-cycle cost (LCC) (Defense Systems Total Ownership Cost (TOC)).
EVALUATE CANDIDATE STRATEGIES	PM must apply decision criteria and decision models to evaluate the candidate strategies. Uncertainty and complex problems must be addressed. If relevant information is not available, valid assumptions are allowed.	<ul style="list-style-type: none"> • Mission requirement and decision criteria satisfaction level • Advantages and disadvantages of each candidate strategy
SELECT BEST CANDIDATE STRATEGY	Perform an evaluation of the candidate strategies using a management decision tool like a matrix.	<ul style="list-style-type: none"> • Strategy that best satisfies the requirement and decision criteria • Strategy chosen
REFINE SELECTED CANDIDATE STRATEGY	PM must review and reassess the strategy's elements.	Realism, stability, balance, flexibility, and managed risk.
IDENTIFY MISSION NEED	PM must revise the Initial Capabilities Document (ICD) and MNS to be sure its compliance with DoD's requirements.	<ul style="list-style-type: none"> • Requirements • Urgency level • Intended use of the system.
ASSESS THE SITUATIONAL REALITIES	PM must assess the project environment, opportunities and program's acceptance level within national objectives, DoD's priorities, and the defense acquisition system	<ul style="list-style-type: none"> • Threat reality • Economic environment and political realities. • Program's relationship to other programs • Technological opportunities. • Cost As an Independent Variable (CAIV) • Review and documentation realities
SELECT SYSTEM CONCEPT(S)	Using the conclusion from the Analysis of Alternatives (AoA) the concept(s) must be selected according to the affordability analysis.	<ul style="list-style-type: none"> • Possible and feasible concepts • Concept(s) which most likely result in satisfying the mission requirements. • Modeling and simulation available to aid system concept identification and selection

3. The Acquisition Strategy at Work

Executing the acquisition strategy is a continuous process of revising, modifying, and adapting the overall plan to present circumstances and environmental conditions to achieve the program's goal or to deliver solutions for previously recognized needs. The management control functions are present in the development of an acquisition strategy as emphasized in the DAU's Acquisition Strategy Guide: "The three functions of control—direction, detection, and correction—describe the activities that are included in strategy management. *Direction* is the process of using resources (e.g., people, dollars, time) to implement plans. *Detection* is accomplished through the use of tools (briefly addressed in Chapter 3) to compare actual with planned results. *Correction* follows detection in those instances where action is required, and plans are changed as appropriate."³³ In addition to the control tools, management information systems must be used to assess the overall performance of the parts involved in the plan in order to provide feedback to the program manager and serve as source of information for external actors (those involved in the acquisition strategy's chain of command).

The logical sequence followed to link the threat assessment, the mission needs, and the operational requirements works also to construct functional strategies for every aspect in consideration to develop functional plans as proposed with the implementation of the acquisition strategy. Appendix C presents the DOD acquisition strategy outline to develop and execute the process as a comprehensive progression of events flowing from requirements, program structures, acquisition approach, risk management, program management, design considerations, support strategy and business strategy.³⁴

E. CHAPTER SUMMARY

This chapter provided a discussion of relevant literature and documents regarding components of the defense acquisition system: acquisition management, acquisition planning, and acquisition strategy. A broad understanding of how the system works was

³³ Defense Acquisition University, *Acquisition Strategy Guide*, p. 4-1.

³⁴ *Ibid.*, p. 3-15.

achieved by the examination of documentation pertaining to the defense acquisition system in the United States of America to back up future analysis and comparison to the defense acquisition process in Colombia in Chapter IV. Only the most relevant and key information was discussed to preserve the scope of this research paper.

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III. COLOMBIAN NAVY

A. CHAPTER OVERVIEW

The origin of the navy in Colombia has its roots in the war of independence from Spain. After defeating the once powerful Spanish fleet at the Batalla del Lago de Maracaibo on 24 July 1823, under the command of Admiral Jose Prudencio Padilla, the patriotic navy achieved the decisive victory, sealing the independence of the nations of the former Great Colombia: Colombia, Venezuela, and Ecuador.³⁵ The Colombian Constitution, in Article 217, institutes the military forces: Army, Navy, and Air Force, with their principal purpose to defend Colombia's sovereignty, independence, territorial integrity, and constitutional order.³⁶ In accordance with its Constitutional purpose, the Colombian Navy has jurisdiction over 928,660 square kilometers of maritime area, 40,875 square kilometers of land area, and more than 15,000 kilometers of fluvial waterways. To accomplish these responsibilities, the Colombian Navy has divided its jurisdictional responsibility into three forces: one specific command and a Marine Corps, Naval Aviation, and a Coast guard as subordinate commands. This chapter describes the Colombian Navy's vision, mission, organization, principal roles, and fleet and staff composition in order to give an overall idea of the operational environment, duties, capabilities, assets, and present situation of the service, and to contribute to developing an acquisition strategy suitable for the Colombian Navy's new strategic ships.

B. VISION

The present Colombian Navy's vision has been derived from the government program: "Vision Colombia II Centenario: 2019" oriented to celebrate the 200th Anniversary of Colombian Independence. The plan foresees the social, economic, political, and security conditions that must be reached in conjunction to create a more

³⁵ Armada Nacional (2007). Vision. Retrieved 14 May 2007 from <http://www.armada.mil.co/index.php?idcategoria=8016>.

³⁶ Republica de Colombia (2007), Constitución Nacional. Retrieved 14 May 2007 from <http://www.cna.gov.co/cont/documentos/legislacion/constitucion.pdf>.

equal society, an economy warranting welfare, a society with free and responsible citizens, and an efficient government in service for its citizens.³⁷ The following is the vision statement for today's Colombian Navy:

By 2019, the Colombian Navy, by means of decisive and forceful operations, will have contributed in the recovery and consolidation of peace and the security of the Colombians; it will have fortified its human talent, weapons, and naval technology until obtaining the dissuasive and operational capacity that guarantees the National defense, protection of its institutions, and the legitimate use of its marine and fluvial spaces; it will be an institution admired and respected in the regional scope, a leader in the development of the Nation's Naval Power.³⁸

C. MISSION

The Colombian Navy's mission origin is in the Colombian Constitution itself, when assigning the duty to preserve the independence and integrity of the territory. Two concepts play a very important role in mission development: dissuasion as one of the principal ingredients of the Colombian government's concept of diplomacy for solving any regional conflict with neighboring countries by peaceful means, and flexibility as the way to maximize the effective use of its limited assets to succeed in the defense of sovereignty. The Colombian Navy's mission is stated as:

To contribute to the defense and security of the Nation through dissuasive and effective use of a flexible naval power in the spaces marine, fluvial, and terrestrial under its responsibility, in order to fulfill its constitutional mission, to contribute to the development of maritime power and to protect the interests of the Colombians.

D. ORGANIZATION

The Colombian Navy's human resources today comprise about 29,000 men and women in the following distribution: 17% Naval personnel, 75% Marine Corps personnel, and 8% civilian personnel. Colombian Navy assets total almost two hundred units ranging from strategic, support, naval air, patrol craft, riverine, and logistic units.

³⁷ Departamento Nacional de Planeacion (2006), "Visión Colombia II Centenario: 2019." Retrieved 14 May 2007 from http://www.dnp.gov.co/paginas_detalle.aspx?idp=888.

³⁸ Armada Nacional, *Plan Estratégico Naval 2007–2010*, Bogota, Colombia, 2007.

The organizational structure follows the traditional military organization of a tall structure with a narrow span of control.³⁹ To provide a better understanding of the Colombian Navy's organization, operational and administrative categories are used.

1. Operational Organization

a. Naval Forces

The jurisdictional maritime and fluvial areas are divided into three naval forces and one specific command, for operational and administrative purposes. Each force has sufficient personnel and maritime, air, and land assets required to fulfill the Colombian Navy's mission in its specific areas. These forces are:

- Caribbean Naval Force: With headquarters in Cartagena, has jurisdiction over four northern Colombian Departments and 589,160 km² of maritime extension in the Caribbean Sea.
- Pacific Naval Force: Has jurisdiction over coastal portions of four western Colombian Departments and 339,500 km² of maritime extension in the Pacific Ocean. Bahia Malaga Naval Base hosts the Pacific Force headquarters.
- Southern Naval Force: The force has its headquarters in Puerto Leguizamo, Putumayo. The Putumayo and Caquetá rivers and their tributaries compose this predominant fluvial jurisdiction located at the southern frontier of the country.
- San Andres and Providencia Specific Command: The jurisdiction for this specific command is San Andres, the main islands of Providencia Department, and the minor islands of Roncador, Serrana, Serranilla, Bolívar, and Alburquerque.

b. Coast Guard

The Colombian Navy performs coast guard duties within its jurisdictional area. The Colombian Coast Guard Corps operates under the authority of the Colombian Navy's Chief of Naval Operations and its organization for operational and administrative purposes comprise the Caribbean Coast Guard Command and Pacific Coast Guard

³⁹ S. MacShane, M. Von Glinov, *Organizational Behavior*, third edition, McGraw-Hill Irwin, New York, NY, 2005, p. 450.

Command. The principal roles of Colombian Coast Guard are the interdiction of illegal drugs in close cooperation with U.S. agencies, preservation of life at sea, and law enforcement. To execute its mission, there are ten Coast Guard stations: San Andres, Punta Espada, Ballenas, Santa Marta, Cartagena, Turbo, Bahia Solano, Buenaventura, Tumaco, and Amazonas. The surface fleet composition is three ocean patrol ships, 12 coast patrol ships, and 60 high-speed patrol boats.

c. Naval Aviation

Under the authority of the Colombian Navy's Chief of Naval Operations, Colombian Naval Aviation supports naval and marine operations within jurisdictional areas. The Naval Aviation organization for operational and administrative purposes comprises the Caribbean Naval Air Group in Cartagena, the Pacific Naval Air Group in Juanchaco, and the Fluvial Transport and Naval Air Support Group in Bogota. Fixed wing and rotary wing assets comprise the Colombian Naval Air fleet.

d. Marine Corps

The Colombian Marine Corps operates within the land, insular, and fluvial jurisdictions assigned to the Colombian Navy. The Marine Corps is organized into three combat brigades and one formation and training center; the combat brigades are First Brigade in Corozal, operating along the Caribbean coast; First Fluvial Brigade in Buenaventura, operating along the Pacific coast, and Second Fluvial Brigade in Bogota, operating along the principal rivers in Colombia. The formation and training center is located in Coveñas. There are three principal roles for Marine battalions: infantry, counter-insurgency, and river operations. The Marine Corps also has three elite structures: Special Forces Battalion, Anti-Kidnap Unit, and Urban Anti-Terrorism Unit.

2. **Administrative Organization**

The Colombian Navy's administrative organization is under the Deputy Officer, who, in accordance with the Commandant's policies, coordinates and oversees the achievement of the specific function given to the headquarters and the specific purpose level within the organization.

a. Headquarters

For administrative purposes, the Colombian Navy has six directorates, one subordinate command, and one transitory directorate to control the Navy.

- **Human Development:** Eight divisions comprise this directorate that addresses all personnel-related areas: planning, control, evaluation, classification, compensation, health, and the naval reserve.
- **Logistics Operations:** This directorate provides logistics support to operational components of the Colombian Navy using four naval bases, five divisions, and two offices.
- **Naval Operations:** This directorate guides and controls the readiness, operation, training, doctrine, and use of naval assets in each one of the Naval Forces, Coast Guard, and Naval Aviation. It is also responsible for the use and management of communications systems and integral action issues.
- **Naval Materiel:** This directorate oversees all matters related to procurement, maintenance, development, and acquisition of naval materiel, naval systems, and weapons for the Colombian Navy, having for that task three divisions, with one specializing on each area.
- **Naval Intelligence:** Five divisions and one school comprise this organization designed to address intelligence issues in the internal, external, counterintelligence, and logistics fields.
- **Marine Corps Command:** The Colombian Navy Commandant controls the Colombian Marine Corps on operational and administrative issues.
- **Naval Incorporation and Education:** Four divisions and three schools integrate this directorate to fulfill the function to provide, educate, train, and develop the personnel that Colombian Navy demands for each category: officers, petty officers, and enlisted personnel.

- Orion Plan Management: The transitory directorate was created in order to manage the Colombian Navy's "Orion plan," which is intended to improve and upgrade the Colombia Navy's assets as well as operational and tactical capabilities.

b. Consultant and Technical Purpose Level

The Colombian Navy Commandant oversees the following offices performing assessorial, control, and special purpose tasks:

- Inspector General: Oversees the fulfillment regulation and policies concerning disciplinary, doctrinal, and fiscal issues.
- Permanent Assessor Group: Gives advice to the Colombian Navy Commandant upon specific issues as needed.
- Institutional Planning: Develops plans and strategies regarding special assignments or sensitive matters.
- Legal Office: Oversees legal compliance and gives counsel in related issues in accordance with orders issued by the Colombian Navy Commandant.
- Special Forces: Under direct Colombian Navy Commandant authority, performs its function for specific or sensitive special operations.

E. ROLES

According to its legitimate mission and the present international environment, the Colombian Navy, as any other modern navy, performs a wide spectrum of roles that has been grouped into the following broad areas,⁴⁰ to be executed for the maritime, fluvial, and land scenarios within the jurisdictional territory:

1. Defense and Security

- War on terrorism
- War on illegal drugs trafficking
- Sovereign and territorial integrity

⁴⁰ Jefatura Oficina Planeacion A.R.C. (July 2006), Plan de Desarrollo 2007–2010, conference presented at Dirección General Marítima, Bogota, Colombia.

- Strategic dissuasion
- Crisis management

2. Maritime Security

- Protection of human life at sea
- Enforcement of the law of the sea and Maritime International Organization (MIO) conventions
- Maritime traffic control
- Aids to navigation

3. International

- Peacekeeping operations
- Humanitarian operations
- Naval Combined exercises participation

4. Sustainability and Resources Protection

- Maritime scientific research
- Fisheries control
- Hydrographic and mapping services

5. Environmental Protection

- Ocean and seas protection
- Prevention of the illicit trafficking of species
- Pollution control

F. FLEET COMPOSITION

A wide range of units comprises the Colombian Navy fleet, normally commissioned to the three Naval Forces and Operational Commands to accomplish the missions within their jurisdictional areas. Different acquisition processes over time have been used to supply the need for units according to the economic and political conditions

of the moment. The fleet composition is presented by separating them into the following categories, normally used by the Colombia Navy and as listed at the Jane's Fighting Ships website.⁴¹

1. Strategic Ships

The Colombian Navy's strategic units are classified as those with the capabilities to defend the nation's territorial integrity and play a dissuasive role in surface, anti-surface, anti-air, anti-submarine, and electronic warfare. The units' acquisition typically has been addressed by purchases of new non-developmental items from European shipbuilders. Table 3 presents the Colombian Navy's current inventory of strategic units.

Table 3. Colombian Navy Strategic Ships

TYPE	QUANTITY	ROLE	ACQUISITION CONDITION	DELIVERED	ORIGIN COUNTRY
Almirante Padilla (Type FS 1500)	4	Light Frigate (FSG)	New	1983-84	Germany
Pijao (209 Type 1200)	2	Attack Submarine	New	1974	Germany
Intrepido, Indomable	2	Midget Submarine	New	1972	Italy

2. Support Ships

Support units include a very diverse array of units playing different roles in the Colombian Navy: personnel transport; support to operations at sea, rivers, and land; personnel training; maritime research; maritime signalization units; and harbor services. Table 4 lists Colombian Navy support units.

⁴¹ Jane's Information Group, Jane's Fighting Ships (2007), Retrieved 18 May 2007 from http://jfs.janes.com.libproxy.nps.edu/docs/jfs/browse_country_results.jsp?&SelPub=jfs&bucket=Country&selected=Colombia.

Table 4. Colombian Navy Support Ships

TYPE	QUANTITY	ROLE	ACQUISITION CONDITION	DELIVERED	ORIGIN COUNTRY
Cartagena de Indias (type 701)	2	Support Ships	Second-hand	1997-1998	Germany
Gloria	1	Training Tall Ship	New	1969	Spain
Providencia	2	Survey Ship (AGS)	New	1981	Germany
Gorgona	1	Survey Ship (AGS)	New	1954	Sweden
Quindío	1	Buoy Tender	Second-hand	1964	U.S.A.
Isla Palma	1	Buoy Tender	New	200-2002	Colombia
Morrosquillo	7	Transport Ship (LCU)	Second-hand	1991-92	U.S.A.
Jaime Arias	1	Floating Dock (ASL)	New	1972	Italy
Tug	16	Ferry Duties	New	n/d	Colombia
Small Supply	10	Transports	Second-hand	n/d	Colombia
Small Craft	11	Bay Support Craft	Second-hand	n/d	Colombia

3. Coast Guard Ships

The United States is the major provider of ships to the Colombian Navy Coast Guard primarily due to bilateral agreements to fight illegal drugs trafficking. Flexibility, high speed, and reliability are the main characteristics of the Coast Guard units. Table 5 lists Colombian Navy Coast Guard Ships.

Table 5. Colombian Navy Coast Guard Ships

TYPE	QUANTITY	ROLE	ACQUISITION CONDITION	DELIVERED	ORIGIN COUNTRY
Reliance Medium Cutter	1	Patrol Boat	Second-hand	2003	U.S.A.
Lazaga Lursen	2	Fast Attack Craft (PCF)	Second-hand	1997	Spain
Cormoran	1	Fast Attack Craft	Second-hand	1996	Spain
Asheville	1	Fast Attack Craft (PCF)	Second-hand	1989	U.S.A.
José Maria Palas	2	Patrol Craft (PC)	New	1989-90	U.S.A.
José Maria Garcia	2	Patrol Craft (PC)	New	1989-90	U.S.A.
Rafael Del Castillo	2	Patrol Craft (PC)	New	1981-83	U.S.A.
Jaime Gomez (Mk III PB)	2	Coastal Patrol Craft (PC)	New	1989-90	U.S.A.
Point Class	4	Patrol Craft (PC)	Second-hand	2000-2001	U.S.A.
Delfin	20	River Patrol Craft (PBR)	New	1992-94	U.S.A.
Andromeda Class	11	Inshore patrol craft	New	1994	U.S.A.
Vega Class	13	Inshore patrol craft	New	1996	U.S.A.

4. Riverine Ships

The Colombian Navy's riverine units operate mostly under the Fluvial Brigades authority or in close coordination with Marine Corps Battalions located along the riverine systems. The Colombian Navy is currently undertaking an ambitious construction program to modernize the riverine support fleet.

Table 6 lists Colombian Navy riverine units.

Table 6. Colombian Navy Riverine Ships

TYPE	QUANTITY	ROLE	ACQUISITION CONDITION	DELIVERED	ORIGIN COUNTRY
Londoño Class (Nodriza)	6	Patrol River Support Boat	Developmental - New	1995	Colombia
Tenerife Class	9	River Patrol Craft (PBR)	New	1993	U.S.A.
Juan Lucio Class	7	River Patrol Craft (PBR)	New	1964	Colombia
Arauca	3	River Gunboat (PG)	New	1956	Colombia
Rotork 412 Craft	2	Patrol Craft (PC)	New	1989-90	U.S.A.
Piraña	150	River Assault Boats (RAB)	New	1993-95	U.S.A.
Swift ships Class	3	River Patrol Craft (PBR)	New	2000	U.S.A.

5. Naval Air Units

The Naval Air units in the Colombian Navy perform duties to enhance maritime surveillance, provide personnel transport, and logistics support, participate in maritime interdiction operations, and close fire support to Marine Corps and joint land operations. The acquisition of fixed-wing assets has increased in order to boost the detection and early warning capabilities of surface units involved in counter-narcotics operations and maritime control area exercises. Table 7 lists Colombian Navy naval air units.

Table 7. Colombian Navy Naval Air Units

TYPE	QUANTITY	ROLE	ACQUISITION CONDITION	DELIVERED	ORIGIN COUNTRY
BO 105 CB	2	Anti-Submarine Helicopter	New	1983	Germany
AS 555 SN Fennec	2	Anti-Submarine Helicopter	New	1997	France
CN-235M-200	2	Maritime Patrol	New	2003	Spain
PA-31 Navajo	4	Maritime Patrol	Second-hand	n/d	U.S.A.
C-212	1	Maritime Patrol	Second-hand	2004	Spain
U206 Station Air Cessna	2	Transport	Second-hand	n/d	U.S.A.
212	1	Maritime Interdiction	Second-hand	1998	U.S.A.
412	4	Maritime Interdiction	Second-hand	1997	U.S.A.
BK 117	1	Transport	Second-hand	2003	Germany

The Colombian Navy’s strategic ships have been historically procured as non-developmental or commercial-off-the-shelf items from governments and shipyards in Europe and the United States mostly due to the lack of an industrial base and technology development in Colombia. Nowadays, the Colombian government making use of the increasing strength in naval technology, has made a gigantic effort to boost the country’s shipbuilding capabilities; therefore, ambitious programs are underway to build offshore patrol ships for the Colombian Navy Coast Guard in the short run.

The country’s economic conditions and budgetary restrictions to invest in programs to procure the latest technologically advanced ships offered in today’s market prevent the Colombian Navy’s leadership from considering the possibility of acquiring new ships. Consequently, the option chosen for this report is to develop a strategy for acquiring second-hand ships, fulfilling the tactical requirements to replace the existing strategic units in the short term due to their life expectancy horizon.

G. CHAPTER SUMMARY

This chapter provided a general description of the Colombian Navy's vision, mission, organization, principal roles, and fleet and staff composition in order to present an overall idea of the operational environment, duties, capabilities, assets, and the present situation of the service. The information provided will be used in Chapter IV to serve as an informative foundation in developing an acquisition strategy suitable for the Colombian Navy's new strategic ships.

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IV. DEVELOPING AN ACQUISITION STRATEGY FOR COLOMBIAN NAVY STRATEGIC SHIPS

A. CHAPTER OVERVIEW

The information considered in Chapter II provided the fundamentals to understand the U.S. DoD acquisition system and how the acquisition processes for defense are based mostly on development of elements, systems, and technologies to meet the needs of combatants on the field, in conjunction with defense contractors. The U.S. DoD acquisition system has been continuously assessed and improved over the last 60 years. There have been frequent major acquisition reforms responding to concerns that the acquisition system had undergone some problems and changes have been implemented.⁴² Given the frequency and the magnitude of the acquisitions made for the military services in the U.S., the system has proven its practicability and feasibility sufficiently to be considered as a model to follow in developing an acquisition strategy for other countries' military services.

The Colombian Navy's acquisition strategy, according to the information provided in Chapter III, has been focused on the procurement of non-developmental items (NDI) or commercial off-the-self items (COTS) to supply for the needs of ships and naval air assets. Budgeting restrictions and the political environment have also motivated the Colombian Navy to seek the acquisition of second-hand ships from governments and suppliers in Europe and the U.S. to improve the operational capabilities at the lowest affordable cost. Great improvements have been made in recent years to acquire self-sufficiency in the naval construction industry, and successful programs, such as the Nodriza project,⁴³ are examples of the capabilities attained in that field.

⁴² Ronald Kadish; Gerald Abbott; Frank Cappuccio; Richard Hawley; Paul Kern; Donald Kozlowski, Defense Acquisition Performance Assessment – Executive Summary, Retrieved 10 April 2007 from <http://www.acq.osd.mil/dapaproject/documents.asp.htm>.

⁴³ Jane's Information Group, Jane's Fighting Ships (2007), Retrieved 18 May 2007 from http://jfs.janes.com.libproxy.nps.edu/docs/jfs/browse_country_results.jsp?&SelPub=jfs&bucket=Country&selected=Colombia.

Consequently, and with the above considerations in mind, the DoD acquisition strategy outline⁴⁴ will serve as a basis for developing an acquisition strategy for strategic ships— tailoring the process according to the realities and needs of the Colombian Navy. This chapter will develop the concepts and present the recommendations using applicable elements in the vein of requirements, program structure, acquisition approach, risk management, program management, design considerations, support strategy, test and evaluation, and business strategy in developing the strategic ships acquisition strategy.

B. ACQUISITION STRATEGY FOR STRATEGIC SHIPS

Recalling the information given in Chapter III, Colombian Navy acquisition is unique in acquiring strategic ships as COTS or NDI from countries and shipyards in the U.S. and Europe, while U.S. DoD acquires capabilities to develop defense systems, ships, and ships' systems all through the life-cycle span. The U.S. DoD acquisition strategy model should be tailored when developing an acquisition strategy for Colombian Navy strategic ships, incorporating specific elements suitable for the realities and needs of the country, as is presented below:

1. Requirements

The description of the requirement for the acquisition must address considerations regarding the required and minimum tactical capabilities for the strategic ships, such as physical dimensions (beam, width, draft), according to the logistic and support capabilities of the Colombian Navy's bases and the country's port facilities. Manpower considerations for crew composition and structure, including expertise level and essential skills for crewmembers, and, finally, the required interoperability with other systems within the Colombian Navy and capabilities to perform joint and combined operations with other military services and allied countries must all be defined.

⁴⁴ Defense Acquisition University, *Acquisition Strategy Guide*, p. 3-15.

2. Program Structure

Figure 5 presents a diagram providing a graphic top-level schedule representation of the proposed program strategy. Particular elements of the program structure will be discussed in the following paragraphs.

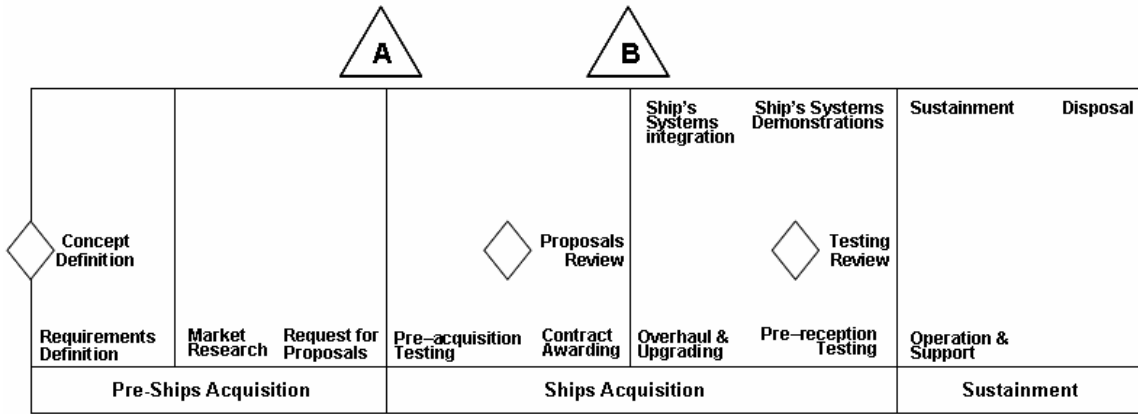


Figure 5. Colombian Navy Strategic Ships Program Structure.

In conjunction with the requirements definition, the market research is intended to explore the capability of the worldwide market to provide ships that fulfill the characteristics required by the Colombian Navy. During the pre-acquisition phase, this element plays a key role because it provides technical and business information used in developing the acquisition strategy. After performing the market research, the program manager must issue the request for proposals to selected potential candidate providers in order to boost competition from the beginning of the project. After receiving the proposals from potential suppliers, milestone A comes into action when the Colombian Navy's designated authorities evaluate the overall performance of the project, participate in the assessments of proposals submitted, and authorize or reject project continuity.

After selecting the most favorable proposals according to the project needs, pre-acquisition tests must be performed on those offers to assess the real condition of the ships and ships' systems to estimate the associated cost to each alternative and review the proposals prior to the definition of the selected proposal and the beginning of the

contract-awarding phase. Upon the selection of the most suitable proposal according to the requirement definition concurrence and business favorability conditions, the decision authorities at milestone B authorize or reject awarding the contracts to the selected provider.

The procurement of NDI or COTS ships in the form of second-hand or on-reserve fleet generally motivate the buyer to overhaul and upgrade some of the ships' systems in order to provide the tactical capabilities required for its intended use. The acquisition approach at this point becomes evolutionary because the upgraded systems capabilities need to be improved according to technology and budget availability in the future. Testing each system condition and the overall integration of the ships' systems after the overhaul and systems upgrade must be performed in Colombian territorial waters to assess the future performance of the ship after being commissioned by the Colombian Navy.

3. Acquisition Approach

The Colombian Navy's acquisition strategy for strategic ships focuses on the available ships as non-developmental items offered by foreign countries and shipyards. This element's principal approach is the market research element followed by evolutionary acquisition when regarding the systems to upgrade selected ships according to the tactical capabilities identified in the requirement description. The acquisition team at this point must exert special emphasis on obtaining estimated costs from commercial offers from different suppliers and the contracting structure proposed to close the deal and the description of the suppliers (governments, shipyards) that shall be included into the request for proposal given the political, economic, and diplomatic favorability conditions, in accordance with the guidance of the Colombian government.

Similarly, market research must identify product reliability according to the operational history and the physical condition of candidate ships, other countries experiences with similar purchases from these governments or shipyards, service

reliability given its own past experiences and other consumer's experiences, available offers in the market place, and supplier flexibility related to the Colombian Navy's business conditions needs and contracting possibilities.

4. Risk Management

The risk assessment of the Colombian Navy's strategic ships acquisition alternatives and program cost, schedule, and technical risk must be provided considering the possible changes in tactical requirements for strategic ships due to a new threat level. Foreseeable changes in funding or budgetary constraints that may threaten the acquisition and how it would be managed and any eventual modification in political and economic conditions of governments or suppliers affecting the acquisition or internal changes regarding Colombian political support affecting the acquisition are issues to address.

In addition, potential risk sources generated by the technological level of the systems to acquire and any additional investments to operate and maintain strategic ships are also sources of potential risk to discuss. The technology translation to maintain and operate ships' systems in the long run, added to any schedule delay and cost increases related to customization of ships and ships' systems to operate in the Colombian marine environment would likewise need attention.

5. Program Management

The acquisition strategy must discuss acquisition initiatives intended to be applied to the acquisition program. Provide a full description of funding related to every step in the acquisition process, associated activities supporting the program, and possible monetary needs for additional resources must be explained, identifying plans to reduce costs.

In addition, this element of the management-related issues must address the information flow and sharing network between the program manager and the Colombian Ministry of Defense's oversight officials, outlining policies and regulations according to sensitive information management. A digital information integration environment must be outlined to provide a reliable command and control system to enhance the decision-

making processes within the program. The use of modeling and simulation tools integrated into program-planning activities across the life of the project and any software development required by the acquisition program must be addressed.

6. Design Considerations

Whereas the Colombian Navy's strategic ships acquisition focus is on NDI, the acquisition strategy must consider aspects to deal with design issues of ships' systems planned for overhaul or upgrade by the supplier prior to the ships' delivery. Technology transition related to ships' systems and how it will be supported in the future dictate an open systems approach as the preferable option when deciding which system to purchase to upgrade ships' capabilities.

In addition to the previous considerations, discussion on how ships and ships' systems must allow interoperability with other Colombian military services and allied countries need to be addressed. Moreover, issues related to information technology management and support actions needed to support program execution must be outlined according to present capabilities and future developments.

7. Support Strategy

The support strategy for the life-cycle sustainment of the strategic ships must be documented emphasizing affordability, reliability, and supportability while sustaining readiness.⁴⁵ Performance-based logistics (PBL) as a package of logistics support functions is the recommended support strategy for Colombian Navy strategic ships because it allows optimization of performance and cost objectives and the Logistic Agency of the Colombian Ministry of Defense shall perform as product support integrator to coordinate relevance functions needed through the life cycle of the project.

⁴⁵ Defense Acquisition University, *Acquisition Strategy Guide*, p. 2-16.

In addition to this, arrangements must be made with the supplier in order for the Colombian Navy's shipyard, COTECMAR, to perform as the source of support for depot maintenance, repairs, and spare parts to optimize the performance of the strategic ships through the life cycle under the supervision of the Naval Materiel Directorate of the Colombian Navy.

Another important aspect related to initiatives to achieve Human System Integration (HSI) through the life-cycle of the project that must be considered are the requirements for training, manpower, safety, and occupational health according to the specific characteristics of the ships. The training must be planned to be divided in different phases: (1) In-country warm up addressing general topics provided by supplier's instructors at Colombian Navy facilities before to mobilizing the crew to take possession of the ship. Translation of knowledge and instructional materials must be done at this stage. (2) Overseas training to achieve the practical phase of the instruction and to get the crew familiarized with capabilities, new systems, and upgrades must be done before delivery. (3) Operational training at sea to be done in Colombian jurisdictional waters to achieve full realism of the environmental conditions in which the ships are to operate. Relevant issues of the support strategy also include discussion of aspects regarding compliance with Colombian environmental, safety, and occupational health regulations and the after-reception assessment agreed with the supplier in order to test and evaluate whether the ships and ships' systems continue to meet requirements, cost performance, and support parameters as required.

8. Business Strategy

Competition and contract approach are the most important drivers to designing the business strategy for acquiring strategic ships for the Colombian Navy. Actions developing these aspects into the program life-cycle must place emphasis on plans intended to built, maintain, and foster competition in order to acquire the best ships and ships' systems at the most efficient cost-benefit relation, encouraging both international and local suppliers to submit offers. Any specification or contracting condition preventing full participation and competition must be evaluated.

Colombian legislation on contracting processes is the framework for defining the contract approach to use in designing the business strategy for acquiring strategic ships for the Colombian Navy. A full description of the contract arrangements, conditions, and events must state types of contract; contract incentives; provisions for changes, delays, or interruptions; and any special contract terms and conditions needs to be discussed. Strategies for monitoring contract cost and schedule performance must be designed either by using the Earned Value Management System (EVMS) or by any other technique.

9. Test and Evaluation

The outline to schedule test and evaluation types, amounts, and timing relates directly to the requirements statement written to describe the need for strategic ships for the Colombian Navy. A master plan developed in conjunction with the different project teams must be designed in order to minimize the program risk. It must include the critical technical parameters, critical operational issues, special test resources, live-fire testing ranges, and scheduling issues.

C. CHAPTER SUMMARY

This chapter summarized the application of the information and concepts gathered in Chapter II and Chapter III into applicable elements from the DoD acquisition strategy. The requirements, program structure, acquisition approach, risk management, program management, design considerations, support strategy, test and evaluation, and business strategy were applied in developing the Colombian Navy Strategic Ships Acquisition Strategy. The next and final chapter presents the conclusions, recommendations, and areas for future research to close the academic cycle of this report.

V. CONCLUSIONS, RECOMMENDATIONS, AND AREAS FOR FURTHER RESEARCH

A. CHAPTER OVERVIEW

This chapter delivers a summary of the work done in preceding chapters, presents an analysis of the findings and key recommendations, and proposes areas for future research and revision regarding the development of an acquisition strategy for strategic ships for the Colombian Navy. The analysis of the findings addresses the results regarding the proposed research questions as well as study limitations and areas of concern. The key recommendations highlight the Colombian Navy need for developing a formal acquisition system based on the assessment of the acquisition current conditions and suggest the involvement of Colombian Navy Naval academies to help in the development of this recommendation. Future research areas discuss the proposed alternatives to provide for the Colombian Navy's need for assets to fulfill its constitutional mission: acquisition via leasing, international cooperation acquisition, and the use of the proposed acquisition strategy when acquiring non-strategic ships.

B. ANALYSIS OF FINDINGS

1. Insights on Research Questions

The broad and complex system in use by the U.S. DoD to acquire defense and information systems, designed to deliver into the war fighter's hands tools using the latest technology available in the market to ensure tactical and operational advantage achieving full spectrum dominance,⁴⁶ can be feasibly adapted to other countries acquisition defense systems given its proven reliability. In the Colombian Navy's case, knowing the uniqueness of the acquisition practices focused on ship acquisitions in the form of NDI or COTS items, the U.S. DoD acquisition strategy elements must be tailored recognizing

⁴⁶ Defense Acquisition University, *Introduction to Defense Acquisition Management*, sixth edition, Defense Acquisition University Press, Fort Belvoir, VA, 2005, p. 11.

that particularity. However, the proximity developed by economic and military alliances between the two countries boost the applicability of the majority of the principles in developing the Colombia Navy's strategic ships acquisition strategy.

Differences in frequency, size, and cost of the defense acquisition systems between the two countries and domestic legal environment are other aspects to consider, making it necessary to adjust strategies according to the military realities and countries' unique requirements. The Navy is a growing military service within the Colombian Ministry of Defense; however, Colombia historically has had a distant political approach to issues related to naval power and maritime power converse to the relevance given to the U.S. Navy in the domestic and foreign policy of the United States.

2. Limitations and Areas of Concern

The major limitation to addressing the objectives of this project was the process of gathering information on the procedures followed by the Colombian Navy in ship acquisition. Many challenges took place: information disparity, dispersion of record keeping, and issues associated with the availability of sources to support the research. The most recent acquisition process for strategic ships took place when acquiring the "Almirante Padilla" class of light frigates from Germany back in 1980. Therefore, the managerial, organizational, and legal environments of today's Colombian Navy reinforce the relevance of this study's findings, conclusions and recommendations.

C. KEY RECOMMENDATIONS

Independent of the availability of resources to support and develop a program to acquire strategic units or any other assets, the Colombian Navy must improve its acquisition capabilities, organizing the acquisition system to optimize the use of scarce funds and to have a well-developed acquisition strategy ready when the political and economic conditions in the country allows the Navy to execute the planned actions. The foundation for this improvement can be accomplished by assessing the present condition of the Colombian Navy's acquisition process, identifying the problems, deficiencies, and areas where improvement is needed.

The bilateral agreements between both navies may host training programs on acquisition-related areas. The Naval Postgraduate School and the Defense Acquisition University offer the education and training needed to create the knowledge base to develop a flexible and reliable acquisition system; therefore, the Colombian Navy must increase the participation of its personnel with the above-mentioned educational centers. The Colombian Navy's education centers would also share responsibility by hosting acquisition upgrading seminars to maximize the transmission of knowledge throughout all personnel involved in the improvement of the system.

D. AREAS FOR FUTURE RESEARCH

1. Acquisition via Leasing

Budgetary and political conditions constrain the Colombian Navy's availability of funds to procure new strategic ships to replace the present fleet; therefore, the most viable option for the present moment is to acquire second-hand ships. Acquisition via leasing from the U.S. government took place in the late 1980s to provide ships for the newborn Colombian Coast Guard. But the situation today concurs with the following reasoning presented by San Miguel, et al, in their professional report dealing with U.S. Navy acquisition via leasing, "How critical is the requirement for national security?" If there is a requirement that is mission-critical, then perhaps capital leasing is a viable option. Capital leasing allows the government to receive and use assets immediately and spread the cash outlays over the lease period rather than frontloading 100 percent of the cost.⁴⁷ Further analysis on this topic would find if this may be, in reality, the best option for Colombian Navy to acquire strategic ships.

2. International Cooperation Acquisition

The key objectives of international cooperative programs are to reduce the costs of acquiring weapons systems through cooperative development, production, and support

⁴⁷ Joseph San Miguel; John Shank; Donald Summers, "Navy Acquisition via Leasing: Policy, Politics, and Polemics with the Maritime Propositioned Ships" (NPS-AM-05-006), Naval Postgraduate School, Monterey, CA, 2005, p. 20.

as well as to enhance interoperability with coalition partners.⁴⁸ The Colombian Navy needs to upgrade and enhance the tactical capabilities of the strategic ships so they are comparable to the ships of other navies in the region. Partnerships to develop ships and ships' systems could be explored with the navies of Chile, Mexico, Brazil and the U.S., given the excellent relationships among them.

3. Use of the Proposed Acquisition Strategy to Acquire Other Naval Assets

The acquisition strategy proposed in this report could be adapted for the acquisition of other types of ships and naval air assets required by the Colombian Navy to fulfill its constitutional mission. The elements presented in the development of the acquisition strategy for strategic ships would be used in future research studies to enhance the performance of existing acquisition programs oriented to provide ships for the Colombian Coast Guard and Riverine Forces.

E. CHAPTER SUMMARY

This chapter provided reasoning based upon information from previous chapters information to clear the research questions motivating this study. In addition, key recommendations were presented to develop the Colombian Navy's acquisition system and areas for further research were proposed to approach the study from different perspectives.

⁴⁸ Defense Acquisition University, *Defense Acquisition Guidebook*, Retrieved 31 May 2007 from https://akss.dau.mil/dag/DoD5000.asp?view=document&rf=GuideBook\IG_c11.2.asp.

APPENDIX A. DEPARTMENT OF DEFENSE ORGANIZATION CHART

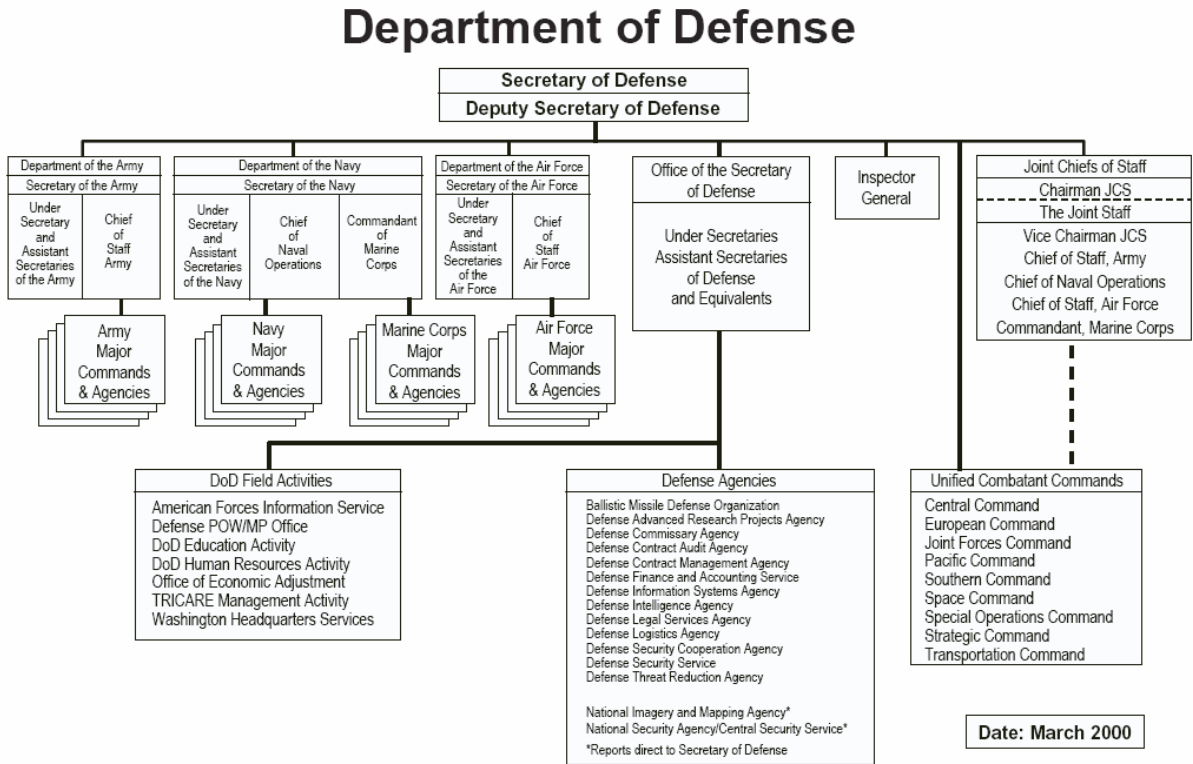


Figure 6. Department of Defense Organization Chart (as of March 2000).⁴⁹

⁴⁹United States Department of Defense (2007). Retrieved 20 March 2007 from <http://www.defenselink.mil/odam/omp/pubs/GuideBook/Pdf/DoD.PDF>.

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APPENDIX B. COLOMBIAN NAVY ORGANIZATION CHART

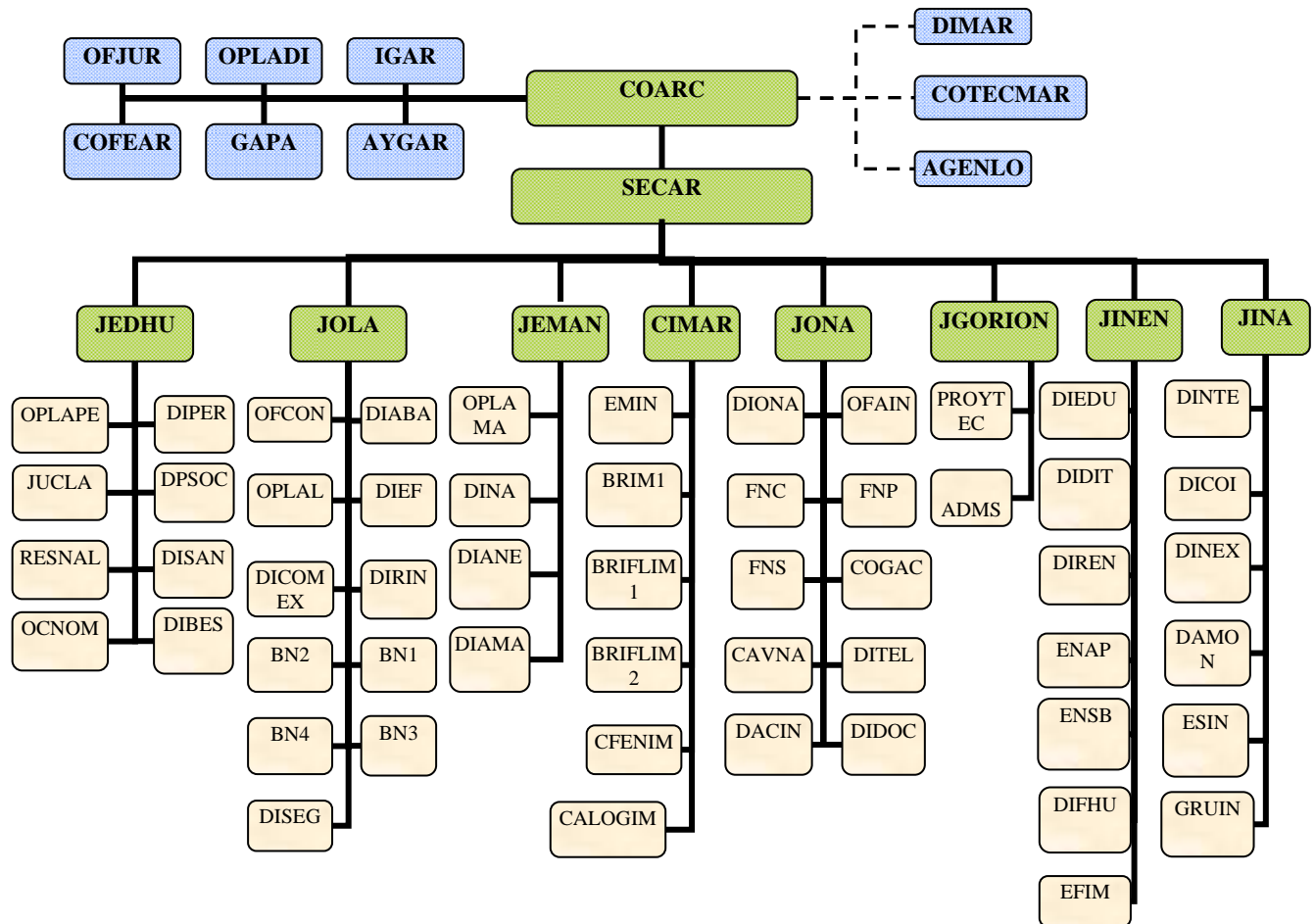


Figure 7. Colombian Navy Organization Chart.⁵⁰

⁵⁰ Armada Nacional, Organigrama, Retrieved 16 May 2007 from <http://www.armada.mil.co/index.php?idcategoria=224>.

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APPENDIX C. DOD ACQUISITION STRATEGY OUTLINE

Table 8. DoD Acquisition Strategy Outline.

<p>1. Requirements.</p> <p>1.1 Summary description of the requirement the acquisition is intended to satisfy; includes interoperability with other systems, dependency with other programs, and whether requirements are structured in time-phased increments or in a single step.</p> <p>1.2 Description of approved or in-process source documents, e.g., IRD, CDD, CPD, etc.</p> <p>2. Program Structure.</p> <p>2.1 See Figure 2-3 of Chapter 2 for Example. The structure is a top-level schedule that provides a one-page picture of the program strategy. It includes relationship among acquisition phases, decision milestones, solicitations, contract awards, system engineering design reviews, contract deliveries, T&E, production releases, and operational capability objectives. It depicts degree of concurrency, phase transitions, and block increments. A funding profile, along with planned procurement quantities, is normally shown by fiscal year and phase.</p> <p>2.2 Program Description. Present background material on how the program got started, what has transpired to date, and current program status.</p> <p>3. Acquisition Approach.</p> <p>3.1 Identify either a single-step or evolutionary approach with rationale for either.</p> <p>3.1.1 If evolutionary, the strategy should describe Block 1 (the initial deployment capability) and the approach to treatment of subsequent blocks—either incremental or spiral development.</p> <ul style="list-style-type: none">• If incremental evolutionary development, define each block of capability and how it will be funded, developed, tested, produced and supported.

• If spiral evolutionary development, describe the funding and schedule planned to achieve the full capability (to the extent it can be defined).

4. Risk Management.

4.1 Provide a well-reasoned risk assessment of acquisition approach alternatives and program cost, schedule and technical risk of selected concept and any variation of that concept.

5. Program Management.

5.1 Philosophy/Approach. Include discussion of streamlining initiatives that have been incorporated in the acquisition program.

5.2 Program Resources. Provide description of planned funding including full funding of procurement end items, advance procurement, program staffing, and affordability analyses/studies. Include discussion of Cost as an Independent Variable (CAIV) trades for affordability, and how defense system Total Ownership Cost (TOC) will be reduced and controlled. Include detailed funding profile for clarity.

5.3 Information Sharing and DoD Oversight. Address how information sharing of programmatic and technical information will be shared with program stakeholders in a secure encrypted environment.

5.4 Integrated Digital Environment (IDE). Discuss how the data management needs of the PM (i.e., a PMO C4I system) will be electronically achieved throughout the system's life-cycle.

5.5 Defense Contract Management Agency (DCMA). Include details on involvement of DCMA and technical representatives in supporting the program. 5.6 Government Property in Possession of Contractors (GPPC). The identification of GPPC and a discussion on how it will be reduced to minimum amount.

5.7 Simulation-based Acquisition. Discuss how Modeling and Simulation (M&S) will be used by the program management functional areas throughout the product's life-cycle.

5.8 Streamlining/Innovative Acquisition. Describe Program Tailoring and how best practices are applied.

5.9 Software Intensive Programs. Describe how the software development approach supports the system-level acquisition strategy, and the use of independent expert reviews.

6. Design Considerations.

6.1 Technology Transition. Address (especially in the Technology Development Strategy (TDS)) how critical technologies will be applied to the developing systems, including a Technology Readiness Level (TRL) risk assessment; and how use of commercial and non-developmental items (NDI) will reduce or increase technology risk.

6.2 Open Systems. Explain how application of the open systems approach will allow incremental system upgradability without major redesign during the system's life-cycle.

6.3 Interoperability. All efforts to make the system interoperable with both U.S. and Allied defense systems should be discussed.

6.4 Information Technology (IT) Supportability. A summary of the infrastructure and support considerations identified in the ICD and CDD and described in the C4I Support Plan (C4ISP).

6.5 Program Protection. Provide information regarding technical, schedule, and cost issues of compliance with critical program information and anti-tamper measures.

7. Support Strategy.

7.1 Product Support. Address how program implements a performance based acquisition strategy, i.e., Performance-Based Logistics (PBL), versus the traditional transaction-based approach. Include description of performance-based metrics, such as availability of mission-capable systems, instead of on distinct elements such as parts, maintenance, and data.

7.1.1 Product Support Integrator. Identify a product support integrator from the Department of Defense or private sector to coordinate functions provided by organic organizations, private sector providers, or a partnership between organic and private sector providers.

7.2 Affordability Improvements. Describe actions to continually improve product affordability for programs in initial procurement, re-procurement, and post-production support.

7.3 Source of Support. Address maintenance, supply and contractor logistics support (CLS) measures.

7.3.1 Depot Maintenance. Describe use of contractor-provided, long-term, total life-cycle logistics support, i.e., CLS, that combines depot-level maintenance for non-core-related workload along with wholesale and selected retail materiel management functions.

7.3.2 CLS In-Theater. Address how program will coordinate with in theater users to identify standards and procedures for integrating CLS into the theater of operations.

7.4 Human Systems Integration (HSI). Identify HSI initiatives within the strategy to integrate manpower, personnel, training, safety and occupational health, habitability, human factors engineering (HFE), and personnel survivability.

7.4.1 Training. Summarize major elements of the training system and identify training initiatives that enhance the user's capabilities, improve readiness, or reduce individual and collective training costs.

7.5 Environmental, Safety, and Occupational Health (ESOH) Hazards. Include a summary of the Programmatic ESOH Evaluation (PESHE) document, including ESOH risks and a strategy for integrating ESOH considerations into the systems engineering process.

7.6 Demilitarization and Disposal. Describe Service logistics and DLA activities, as appropriate, necessary to eliminate the functional or military capabilities of defense assets.

7.7 Life-Cycle Oversight. Address how PM and other responsible organizations will maintain appropriate oversight of the fielded system's support, readiness, performance, and ownership costs.

7.8 Post Deployment Evaluation. Test and Evaluation activities conducted to verify that the system and modifications/enhancements continue to meet cost, performance, and support parameters approved at Full-Rate Production decision review.

7.9 Other factors. Address miscellaneous support factors, e.g., long-term access to product configuration technical data, personnel survivability and habitability, etc.

8. Business Strategy.

8.1 Competition. Describes plans to attain program goals via competition, throughout all phases of the program's life-cycle, or explain why competition is neither practicable nor in the best interests of the Government.

8.1.1 Fostering and Maintaining a Competitive Environment. Address any exceptional circumstances in which the Department needs to act to maintain future competition.

8.1.2 Building Competition. Discuss activities such as competitive prototyping, competitive alternative sources, and competition with other systems that may be able to accomplish the mission should be discussed.

8.1.2.1 Competition and the Acquisition Phases. How will competition be applied throughout the life of the program?

8.1.2.2 Competition and Evolutionary Acquisition. Cover how competition will be tailored to the nature of each block, from the initial block of capability through successive time-phased blocks.

8.1.2.3 Industry Involvement. Describe past and planned industry involvement in the program, including knowledge gained from industry when developing the acquisition strategy.

8.1.3 Potential obstacles to competition. Discuss the impact of exclusive teaming arrangements, vertical integration and proprietary designs on competition, and alternative approaches taken to mitigate these contractor strategies.

8.1.3.1 Subcontractor Competition. When competition is not planned at the prime contract level, the strategy should identify plans for bringing competitive pressure to bear on the program through competition at major subcontractor or lower tiers or through other means.

8.1.4 Potential Sources. Discuss following as possible sources of defense systems and supply: international, domestic, dual-use, Small Business Innovation Research (SBIR) technologies, commercial and non-developmental items, small businesses, and intra-Government work agreements. Include results of completed market research and plans for future market research.

8.2 International Cooperation. Discuss the potential for increasing, enhancing, and improving the conventional forces of the North Atlantic Treaty Organization (NATO) and the United States, through reciprocal defense trade and international cooperative research, development, production, and logistic support.

8.2.1 International Interoperability. Discuss how the program/system will achieve deployment and sustainability of interoperable systems with our potential coalition partners.

8.2.2 Testing for International Programs. Describe test process for international systems – both for cooperative programs and foreign military sales.

8.3. Contract Approach. Describe what the basic contract buys; how major deliverable items are defined; options, if any, and prerequisites for exercising them; and the events established in the contract to support appropriate exit criteria for the phase or intermediate development activity; also assess whether the production program is suited to the use of multiyear contracting based on FAR requirements.

8.3.1 Contract Types. Identify the type of contract planned (e.g., firm fixed-price (FFP); fixed-price incentive, firm target; cost plus incentive fee; or cost plus award fee) and the reasons it is suitable, including considerations of risk assessment and reasonable risk-sharing by the

Government and the contractor(s). Include discussion of contract options, long-lead items (LLI), and any other unique contracting issue.

8.3.2 Contract Incentives. Explain the planned contract incentive structure, and how it incentivizes the contractor(s) to provide the contracted product or services at or below the established cost objectives.

8.3.3 Contract Performance Management. Describe how integrated cost and schedule performance data from the Earned Value Management System (EVMS) will be used to monitor program execution.

8.3.4 Integrated Baseline Reviews (IBR). Summarize how IBRs will be used to evaluate contract performance risks inherent in the contractor's planning baseline.

8.3.5 Special Contract Terms and Conditions. Identify any unusual contract terms and conditions and all existing or contemplated deviations to the FAR or DFARS.

8.3.6 Warranties. Examine the value of warranties on major systems when appropriate and cost-effective.

8.3.7 Component Breakout. Briefly justify a component breakout strategy if one is selected.

8.3.8 Leasing. Consider the use of leasing in the acquisition of commercial vehicles and equipment whenever the PM determines that leasing of such vehicles is practicable and efficient.

9. Test and Evaluation. Describe key aspects of the T&E approach that will require special management focus by the PM in order to reduce program risk; provide a strategic outline for those who develop the Test and Evaluation Master Plan (TEMP). A few -example topics are: critical technical parameters, critical operational issues, critical facility requirements, special test resources, live fire testing, and/or test range scheduling issues.

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