

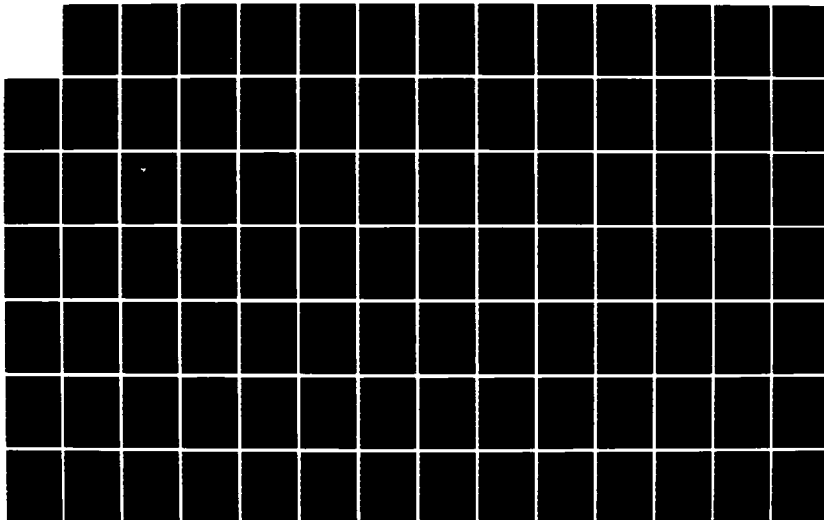
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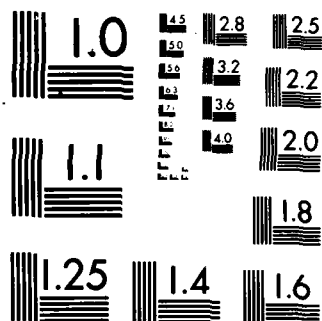
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EMPLOYMENT PROBLEMS ASSOCIATED WITH
THE ACCELERATED DELIVERY OF THE F-16
TO THE REPUBLIC OF VENEZUELA

THESIS

Matthew N. Davis
Captain, USAF

AFIT/GLM/LSP/86S-13

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EMPLOYMENT PROBLEMS ASSOCIATED WITH
THE ACCELERATED DELIVERY OF THE F-16
TO THE REPUBLIC OF VENEZUELA

THESIS

Presented to the Faculty of the School of Systems and
Logistics of the Air Force Institute of Technology

Air University

In Partial Fulfillment of the
Requirements for the Degree of
Master of Science in Logistics Management

Matthew N. Davis, B.A.

Captain, USAF

September 1986

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ACKNOWLEDGEMENTS

I wish to extend my sincere appreciation to all those who contributed to the completion of this thesis effort.

I am deeply grateful to my thesis advisor, Major Mike Farr, and my reader, Lt Col Fred Westfall for their guidance, patience and advice. Lt Col Manuel Vega and Mr. Marty Martinez of the International Logistics Center for their assistance on information regarding Venezuela and the Peace Delta program. Mr. Robert Drewry, Mr. Ken Wood, and Mr. John Gilbert of the General Dynamics Corporation, Fort Worth Division, on their views of some of the industry experiences with Peace Delta, and Mr. Ed Perrault of the F-16 System Program Office on assisting me in putting the finishing touches on this thesis.

Finally, I wish to extend my love and sincere appreciation to my wife Leslie who supported me throughout this effort. To Pepper, who kept me company during those late nights and early mornings on the computer. To David Letterman who kept me entertained, and to Epson America Inc. who made it all possible, despite the seemingly endless occurrences of word processor error condition #16.

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Abstract

This thesis investigated the employment problems of the Peace Delta FRMS program associated with the accelerated delivery of the F-16 aircraft. Three areas were considered during this study. The effect of accelerated delivery on maintenance and training, the effect on logistics support and the effect on the infrastructure of Peace Delta. The results of this project should be applicable to other FMS programs which involve accelerated delivery of a particular weapon system.

EMPLOYMENT PROBLEMS ASSOCIATED WITH
THE ACCELERATED DELIVERY OF THE F-16
TO THE REPUBLIC OF VENEZUELA

I. Introduction

Overview

The national security objectives of the United States are intertwined with the sovereignty and internal stability of South American nations (1). Consequently, United States foreign policy incorporates the extensive use of arms transfers to selected nations requesting security assistance. America's key objectives in the South American/Caribbean region are democracy, peace and development (2:1-35). These key objectives have been threatened by a powerful Soviet/Cuban/Nicaraguan drive to expand their power and influence in the area.

In the last few years, the quantity and quality of Soviet arms sent to Cuba, and through Cuba to others, have sharply increased. In 1981 the Soviet Union provided Cuba with over 63,000 tons of arms, the largest inflow in 20 years (3). Included in these shipments were top-of-the-line, high-performance aircraft, anti-aircraft weapons, armored vehicles, rocket launchers, and even submarines (3). Nicaragua, which receives Soviet arms, threatens to create forces that far exceed any reasonable

needs for defense.

Meanwhile, Cuba has renewed its efforts to export revolution in the Caribbean and Latin America. Cuban-supported forces have taken power in Nicaragua and threaten to destroy El Salvador's hope for political and social reform. Cuban-supplied and directed efforts to undermine elected governments have been exposed in Guatemala, Honduras, and Colombia (3).

In 1981 President Reagan announced a new conventional arms transfer policy to supplement our own defense buildup and our foreign assistance efforts. The policy was designed to help us counter Soviet aggression, Soviet proxies, and the massive Soviet arms transfers which destabilize regions of strategic importance to the West (4:72).

The government of the Republic of Venezuela in May 1982 signed an agreement with the government of the United States to purchase, on a cash basis, 18 F-16A and 6 F-16B aircraft. The sale, including initial training, spare parts, and support amounted to approximately \$615 million (5).

Venezuela is a key source of oil and a strategically located democracy which plays a constructive and growing role in an important region.

-- Venezuela produces approximately 1.9 million barrels of oil per day (4:73). Other than Mexico, and our own country, Venezuela is the only major source of oil in this hemisphere. If oil supplies from the Persian Gulf were cut off, Venezuelan oil would be critical to the United

States.

-- Venezuela controls the eastern approaches to the Panama Canal and lies adjacent to the major sea lanes of the eastern Caribbean.

-- In the past few years, Venezuela has contributed to regional stability by subsidizing oil prices and providing financial assistance to less well-off nations. Also, Venezuela has joined with Canada, Mexico, and the United States in the formation of the Caribbean Basin Initiative (6:13).

With the purchase of 24 of the most advanced fighter aircraft in the world, Venezuela has modernized its air forces with aircraft that will serve its defense needs into the 21st century.

Specific Problem

Venezuela has spent millions of dollars in acquiring sophisticated fighter aircraft for national defense. Having acquired the essential elements of a first-rate air defense system, they must then effectively employ them to provide the protection truly required. Employment involves an overall management philosophy and its efficient application, a maintenance plan involving trained personnel and adequate facilities, and an infrastructure designed to support the entire program. The letter of offer and acceptance (LOA), signed in May 1982, called for the delivery of all 24 F-16 aircraft within a 42 month period, with the first six

delivered within 18 months (5). The Air Force standard for support of a new program is to begin aircraft deliveries no earlier than 42 months after LOA signature. The Air Force feels this much time is needed to prepare facilities, stock aircraft spares, lay in support equipment, and train support personnel (7:1). The accelerated delivery schedule may have resulted in numerous problems with the Venezuelan sale; such as lack of adequate facilities, shortage of trained personnel, and logistics support difficulties. Considering the potentially adverse impact on U.S. security assistance goals as well as on the defense posture of Venezuela, this research will consider the following research questions, the answers to which could help the U.S. reduce problems with future sales of this type.

Research Questions

1. What effect has accelerated delivery had on the training of support personnel, and the maintenance and flying programs?
2. What effect has accelerated delivery had on logistics support?
3. What effect has accelerated delivery had on the infrastructure that was designed to support the entire program?

Definitions

The following terms will be used during this research effort. Their specific meanings are provided.

Aircraft Spares - Components which are available to replace like defective items on an aircraft in order to enable it to perform its primary mission.

Aircraft Support Equipment - Items which are used to directly support aircraft flying operations but are not considered part of the aircraft itself. For example, aerospace ground equipment such as tow tractors, aircraft power units, and lighting units and items such as aircraft ladders and maintenance stands.

Automated Logistics Management System - A logistics support system consisting of an IBM computer which automates the storage, requisitioning, and issue of all F-16 aircraft spares for Venezuela.

Caribbean Basin Initiative - A policy formally announced in 1982 which provided for \$350 million of emergency U.S. aid to countries located within the Caribbean Basin. Allows most Caribbean exports to enter the United States duty-free for 12 years. Promotes U.S. private investment in the Basin by providing tax incentives for U.S. companies to operate there and by negotiating treaties to protect their investments (6:13).

Contractor Interim Support Program - A General Dynamics program in which a team of highly skilled contractor personnel will provide training to Venezuelan Air Force personnel and maintain the F-16 aircraft until host country self-sufficiency is obtained.

El Libertador Air Base - The facility located at

Maracay where the 24 F-16s sold to Venezuela are based.

Foreign Military Sales - A subset of security assistance. That portion of the security assistance program in which sales of defense articles and services are made to friendly foreign countries by the United States government or United States private industry (2:2-14).

Fuerza Aerea Venezolana - Name for the Venezuelan Air Force, commonly abbreviated FAV.

Infrastructure - The permanent installations required for military purposes. In the case of Peace Delta, those facilities located at El Libertador AB which support the F-16 aircraft.

Lead Time - The time required for the production and delivery of a requisitioned item from a manufacturing source.

Letter of Offer and Acceptance - The form used for all foreign military sales of defense articles, services and training by the military departments and authorized defense agencies. When signed, it is the official agreement between the U.S. and the purchasing nation regarding terms and conditions pertaining to furnishing certain goods and services (2:12-1).

Line Replacement Unit - An aircraft component, usually of a high dollar value, which can be easily removed and replaced on the aircraft in the event of failure.

Peace Delta - Program name given to the sale of 24 F-16 aircraft by the United States to the Republic of Venezuela

(6).

Security Assistance - The actions of the United States government to provide defense articles and services to friendly foreign countries. Security assistance includes military sales and aid programs. This term is sometimes used interchangeably with military assistance (2:1-6).

Scope and Limitations

This thesis concentrates on determining the various problems of employment due to accelerated delivery and does not provide an in-depth study of any single aspect of the F-16 weapon sale to venezuela. Information sources utilized are either unclassified or "for offical use only." Classified sources and information are not included in this thesis. Program actions after July 1986 are not included in this thesis research.

Plan of Presentation

This study of employment problems associated with accelerated delivery of the F-16 aircraft is presented in eight chapters.

Chapter I, "Introduction", presents a brief overview of the justifications for the Peace Delta program and a glossary of terms used during the research. The problem statement is defined and three research questions are formulated to guide the research effort.

Chapter II, "Methodology", outlines the research approach used to gather the information which provides the

answers to the three research questions posed in chapter I. The types of data sources used in the research effort are also summarized.

Chapter III, "The Peace Delta Environment", examines Venezuela's historical evolution, location, military and political structure, security requirements, and characteristics of the population to better understand the shared ideals of both nations and the importance of having Venezuela as an ally.

Chapter IV, "Peace Delta", provides a more in-depth look at the program itself. A summary of the Senate hearing on the sale of the F-16 to Venezuela is presented along with an overview of the terms and conditions of the Peace Delta LOA.

Chapter V, "Maintenance and Training", looks at the maintenance and training plan for Peace Delta and the contractor interim support program devised to cope with the accelerated delivery schedule. An overview of the current problems in the maintenance and training areas are presented in the final section of this chapter.

Chapter VI, "Logistics Support", presents a summary of some of the logistics considerations of Peace Delta, such as the automated logistics management system, follow-on spares and support equipment, and the cooperative logistics supply support arrangement concept. The chapter concludes with current logistics deficiencies in the program.

Chapter VII, "Infrastructure", addresses the facilities

requirements for F-16 operations at El Libertador AB. The findings of the site survey team are presented along with a summary of problem areas concerning current facilities at El Libertador AB.

Chapter VIII, "Summary and Conclusions", provides an overall summary of the thesis. The results of the research are presented, and the research questions answered. The author's final comments on the Peace Delta program are summarized, and the chapter concluded with a recommendation for further research.

II. Methodology

Research Approach

Because the F-16 weapon sale to Venezuela was a fairly recent occurrence, existing knowledge was insufficient for the use of comprehensive survey questionnaires that could then be analyzed by various statistical techniques. As a result, this research proceeded in two stages. Initially, conclusions from current demographic, political, and sociological studies of Venezuela were reviewed along with official U.S. State Department comments concerning the purpose of Peace Delta. Additionally, an analysis was made of the support requirements of Peace Delta indicated in the formal program description. Conclusions drawn from this initial effort formed the basis for a subsequent flexible interview technique used in the second stage to identify specific problems of employment facing the Peace Delta program.

During personal interviews a flexible interview technique was followed and addressed the following areas:

- 1) Interviewee's background and specific role in the program.
- 2) Interviewee's comments and views on the research questions which are used in the study.
- 3) Interviewee's additional comments or opinions relating to any aspect of the Peace Delta program.

The interview technique which was used during interviews

took into consideration the interviewee's job and experience. Some questions were not applicable and therefore were not asked. Some questions were added to obtain a more in-depth understanding of a particular area. Flexibility was the key to a successful interview.

Personal interviews were conducted with individuals in the following activities:

- 1) F-16 Program Office, Aeronautical Systems Division, AFSC. (Mr. Perrault, Capt Ramirez)
- 2) Deputy for Latin American Programs, International Logistics Center. (Lt Col Vega)
- 3) Venezuelan Country Manager, International Logistics Center. (Mr. Martinez)
- 4) Program Managers and consultants, General Dynamics Corporation. (Mr. Drewry, Mr. Wood, Mr. Gilbert)

The primary purpose of employing interviewing was to identify specific employment problems due to accelerated delivery in Peace Delta. The actual identification of these problems resulted from a comparison of the information obtained from the interviews, with the conclusions drawn from the analysis in the first stage of the research methodology.

Data Sources

In conjunction with this research effort, an extensive data search and review was conducted. The data sources analyzed can be subdivided into five general categories: (1) published civilian sector studies, (2) current

periodicals, (3) professional journals, (4) published and unpublished government documents, and (5) unpublished private corporation documents.

Published Civilian Sector Studies. Numerous civilian sector studies of Venezuelan history, culture, society, politics, and economics exist. These studies provided an excellent overview of Venezuela as a nation, including its origins, its current state of affairs, and the problems confronting its future. The studies by Weil, Black, Blutstein, Martindale, McMorris, Merry, Munson and Townsend are particularly helpful in comprehending past and present Venezuelan culture, society, religion, and finances. The studies by Bond and Tugwell are excellent analyses of the role oil has played in Venezuelan politics and economic policies. The studies by Martz, Myers, and Powell give insight into patterns of Venezuela's past political structure, public attitudes toward the democratic regime, and the future of Venezuelan democracy. The study by Bond is a comprehensive review and analysis of Venezuela's foreign relations with other countries and highlights the ongoing territorial dispute with neighboring Guyana.

Current Periodicals. Periodicals such as Businessweek, Forbes, and The Wall Street Journal provide current information on the present economic conditions, policies and oil production in Venezuela. Publications such as Air Force, Aviation Week and Space Technology, and Commonweal furnish information on the sale of the F-16 to the Republic

of Venezuela. Newsweek, Time, and The New Republic provide numerous sources of information on additional miscellaneous topics concerning Venezuela.

Professional Journals. Several professional journals present a balanced view of U.S. - Venezuelan foreign relations. The American Review, Armed Forces Journal International, and Foreign Affairs provide excellent analyses of current and proposed U.S. - Venezuelan foreign policy initiatives. The Defense Institute of Security Assistance Management Journal and the Air Force Journal of Logistics provide current information on the F-16 weapon sale, such as follow-on logistics support, and problems encountered with the sale.

Published and Unpublished Government Documents. Government documents are a key source of information on foreign military sales policies and procedures. Air Force Regulation 400-3, Foreign Military Sales outlines the authority, administrative restrictions, and official guidance for conduct of USAF personnel and FMS customers involved in sales. It states the FMS policies of the United States and explains the general implementation procedures. Department of Defense Directive 5105.30 Military Assistance Manual sets forth responsibilities, policies, and procedures governing the administration of Security Assistance Programs within the Department of Defense agencies and personnel engaged in Security Assistance activities. The Compendium of Authenticated Systems and Logistics terms is a

comprehensive dictionary of logistics terminology published by the Air Force Institute of Technology. Specific definitions of many acronyms and specialized terms are provided in this digest. State Department Bulletins and Releases provide verbatim copies of official statements made by key foreign policy decision makers, including presidential letters to Congress, and both State and Defense Department press releases. Official analyses of these releases are also provided. The letter of Offer and Acceptance and its amendments form the basis of the contract between the governments of the United States and Venezuela. All other documents are considered working documents and are subordinate to the LOA. The LOA spells out the exact terms of the Peace Delta sale and is considered the primary source document of the program.

Unpublished Private Corporation Documents. The Peace Delta Contractor Follow-on Support Phase I, II, and III Management Plans provides a detailed description of the objectives and organization of the overall Management Plan for Peace Delta. In addition, they also outline contractor responsibilities in the areas of personnel, training, maintenance, supply, technical data, transportation and facilities. The F-16 Program Today gives an overall view of the General Dynamics F-16 program, with a special section devoted to Peace Delta. The Venezuelan Site Survey was an in-depth report of the existing facilities at El Libertador AB and assessed their suitability for F-16 operations.

III. The Peace Delta Environment

Overview

The study of the major employment problems encountered with the Peace Delta security assistance program would be incomplete without a review of some of the events and other factors that made Venezuela such an important ally of the United States of America. In addition, a look at Venezuela's historical evolution, location, and events leading to this mutual relationship will give a better understanding of the shared ideals of both nations. The United States and Venezuela share mutual objectives in strengthening democratic institutions; accelerating economic and social development; opposing international terrorism; and enhancing the security of the Western Hemisphere against aggression or subversion. Venezuela is traditionally one of our most reliable foreign suppliers of petroleum. This chapter then discusses Venezuela's geography and climate, history, social environment, economic environment, government and political structure, national security requirements and military structure, and a brief review of past and present U.S. security assistance programs.

Geography and Climate

Venezuela is located on the northern coast of South America, between 0 degrees 12'N, and 59 degrees 45' and 73 degrees 09'W, and covers 912,050 square kilometers-about the

size of Texas and Oklahoma combined (Figure 1) (8:1). It is bounded on the north and northwest by the Caribbean Sea, on the northeast by the Atlantic Ocean, on the west by Columbia, on the east by Guyana, and on the south by Brazil (Figure 2) (9:90).

The Orinoco River and various mountain ranges divide the country into four distinct geographical regions (Figure 3) (8:1).

--The Maracaibo Lowlands encompass almost 51,780 square kilometers of level plains around Lake Maracaibo and the Gulf of Venezuela, extend south and west to the Venezuelan Andes, and include the Paraguana Peninsula (10:8).

--The Northern Mountains and their spur ranges extend close to the northern coastline from the Paria Peninsula on the east to the Colombian border on the west. The Cordillera de Merida mountain chain broadens northward to form the Segovia Highlands which consist of heavily eroded plateaus decreasing in elevation from 1,850 meters at their southern extremity, to 185 meters in the north before descending to the coast (10:11).

--The Orinoco Lowlands are the great plains that extend from the Atlantic Ocean south to the Colombian border and lie between the Northern Mountains and the Orinoco River. The region covers 258,900 square kilometers and is nearly 1613 kilometers long and between 81 and 403 kilometers wide. There are a few small forests, but most of the plains are natural pastureland (10:12).



Figure 1. South America

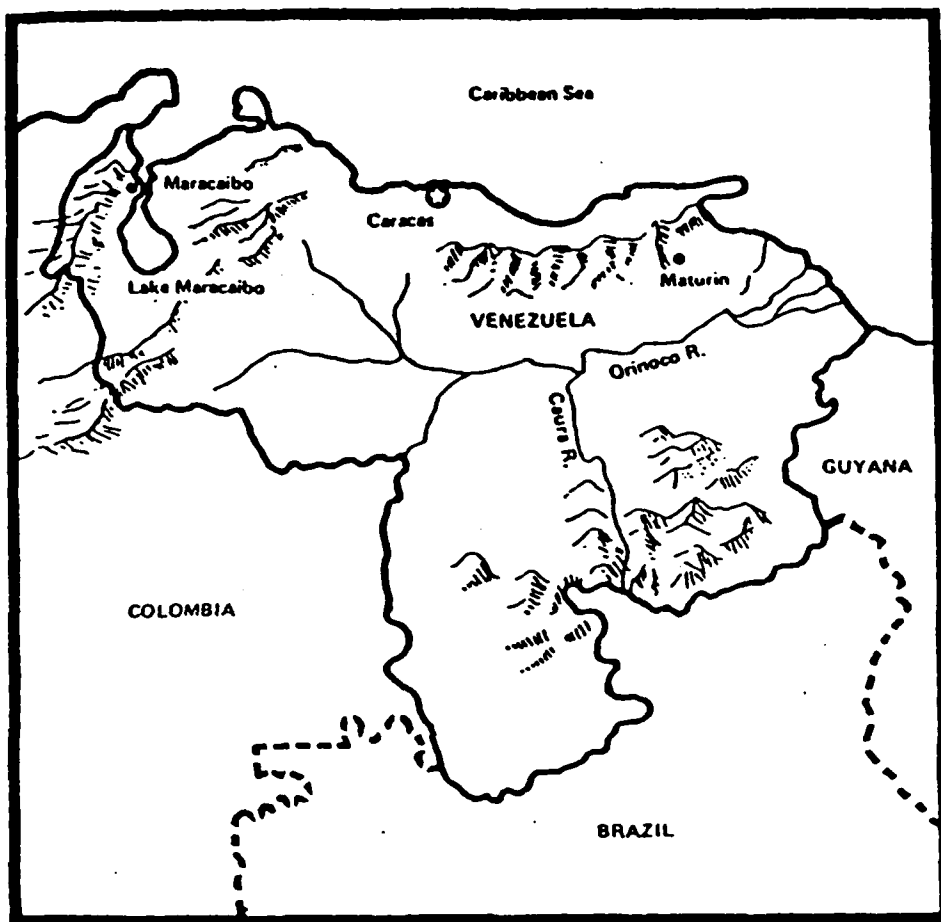


Figure 2. Venezuela

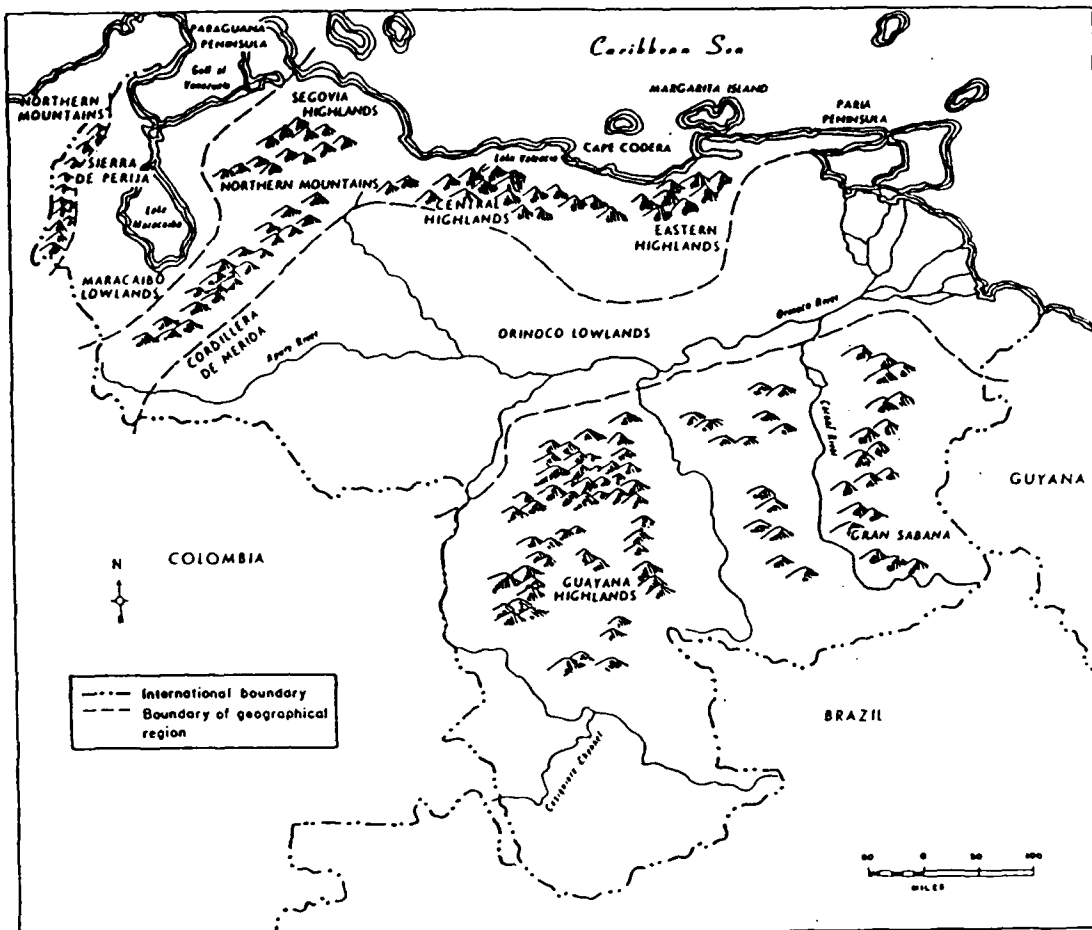


Figure 3. Geographical Regions

--The Guayana Highlands south of the Orinoco River are considered to be the oldest land areas in the country. Comprising roughly 57 percent of the country, the 647,250 square kilometer area consists principally of plateau areas laced with swiftly running tributaries of the Orinoco River. This region is rich in mineral resources as well as both developed and potential hydroelectric power (8:1).

The climate of Venezuela is greatly influenced by elevation. At low elevations is an area called the tierra caliente, or hot country, where temperatures average 23 degrees to 26 degrees Celsius. The tierra templada, or temperate region, lies at elevations from 900 to 1850 meters where temperatures average 18 degrees to 23 degrees Celsius. The tierra fria, or cold country, lies at elevations from 1850 to 3,000 meters. At this altitude temperatures range between 12 degrees and 18 degrees Celsius (9:92). Mountain peaks in the cold zone generally have snow, glaciers, and ice caves (10:14).

For most of the country, the rainy season is from May through November; the rest of the year is dry (11:2). Annual rainfall varies widely within the country. Along the Caribbean coast, the annual total is approximately 280mm. More than 2,000mm of rain falls in parts of the Maracaibo Lowlands and the Guayana Highlands (9:92).

General Historical Information

Venezuela's historical development can be broken down

into five distinct periods: discovery and colonization (1498-1810), Independence (1810-1830), The Caudillo years (1830-1935), The transition years (1935-1958), and the Democratic years (1958-Present) (10:27-47).

Discovery and Colonization (1498-1810). On August 1, 1498, during his third voyage to the New World, Christopher Columbus became the first European to sight the land that is now present day Venezuela (10:28). Observing the continent from where his ships were anchored off the coast of Trinidad, Columbus assumed it was another island. Three days later he sailed across the Gulf of Paria to the Paria Peninsula and for several days sailed along the coast exploring the area. His interest was captured by the pearl ornaments worn by the Indians he encountered during this exploration.

The lure of pearls and other riches drew adventurers and fortune hunters into the area after the departure of Columbus. First among them was Alfanzo de Ojeda in 1499, a crewmember of Columbus the previous year (9:99). The Ojeda expedition followed the same route Columbus had taken on his third voyage. Sailing into Lake Maracaibo, Ojeda saw native huts built on stilts and because these houses reminded him of Venice, he named his discovery Venezuela or Little Venice (10:28).

The indian tribes that inhabited Venezuela at the time of Columbus and Ojeda showed wide variation, from sophisticated farmers to wandering food-gatherers and

cannibals. They did however have one important trait in common, they were almost all warlike and did not adapt well to Spanish attempts to control and enslave them (10:28). Certain tribes, such as the Timotes of the Andean region, had advanced farming techniques based on irrigation and terracing. The Carib cultures along the coast were also fairly advanced as evidenced by their complex social and political organizations, fortified villages and agricultural techniques. It was the Carib tribes, particularly the Teques and the Caracas, that presented the greatest resistance to the would-be conquerors (10:29).

In the period from about 1502 to 1530, many adventurers approached the coast simply to rob, fish for pearls and enslave the Indians (12:10). At the same time, there was a movement toward colonization in eastern Venezuela, especially on the island of Cubagua. By 1520, about 300 people had settled and built houses, founding a township which became known as Nueva Cadiz. For the next 20 years, it was one of the most prosperous settlements in the Indies, with a population of 1,000 people and huge profits from its oyster beds (13:33).

Foreign investors began to make their presence known in the 1530s after the Welsers, a German banking family, received the right to conquer and settle western Venezuela as security on a loan floated by Charles V of Spain (14:5). This agreement was a breach in the policy of excluding non-Spanish adventurers from the Americas, in addition, the

activities and methods of the conquerors operating under German control were a departure from accepted Spanish norms (15:65). The Welsers devoted all their energies and resources to a frantic search for El Dorado, a mythical king of a fabulous and wealthy civilization. During the 20 years of their explorations, expeditions ranged widely throughout the Andes, the Maracaibo Basin, the Llanos of Barinas and into areas of what is now Colombia. Everywhere, they searched for evidence of gold, silver and precious stones. These explorers were particularly ruthless with the Indians who resisted them, retaliating against real or imagined threats with uncommon ferocity. By the 1540s, the German incursion had ended. It concluded not only because it failed in its attempts to discover El Dorado, but also because its ruthless form of exploration and conquest became a nuisance to the crown. After the Germans departed, settlement began to expand in the traditional Spanish fashion from the original base in Coro (15:56-66)

With an increase in the number of Spaniards, the resource base at Coro proved inadequate, and in 1555 Juan de Corvayal led a band of settlers away from the city into the Segovia Highlands (15:66). Stopping in the valley of El Tocuyo, the expedition soon established a town. This settlement quickly prospered and became the major focus of Spanish activity in western Venezuela. The establishment of El Tocuyo marks the beginning of active, aggressive efforts to complete the conquest and colonization of Venezuela. The

Spaniards from El Tocuyo spread out in search of the real Venezuela, a country whose prosperity would not come from the riches of gold or silver, but from agriculture and livestock (15:66).

During the century and a half from 1580-1720, Venezuela made its choices and determined to a large extent the shape of its future. In 1580 Venezuela was nothing more than a collection of small urban centers attached to limited geographic regions with independent lines of communication. But as the century wore on, these diverse organizations began to consolidate in response to external pressures from Spain, the Caribbean, Mexico and Europe (15:72).

In the 18th century, Spain, in an attempt to regain its absolute authority over the Venezuelan colony and eliminate the colony's trade with the English, French and Dutch, created the Caracas Company (16:4). The company was owned largely by Basque capitalists, and judging from the high returns on cargo, the high dividends paid to stockholders, and the spread of company agencies, was extremely profitable. It made every effort to attack and quash its foreign and domestic rivals engaged in smuggling and illegal trade (12:21). The Caracas Company also played politics by appointing its friends, agents, and officers to government councils and boards. Dissatisfaction with the unpopular company culminated in an armed revolt which took place in 1749. In that year, a group of merchants led by Francisco de Leon, began an armed resistance that took Spain four

years to quell (10:31). The uprising led Spain to make a number of policy reforms toward Venezuela and eventually led to the collapse of the Caracas Company in 1784 (16:4). However, dissatisfaction with Spain didn't end at this point; in fact, it showed many people that they could stand up against Spain. Armed uprisings occurred in 1795, 1797, and 1799; and in 1806 Francisco de Miranda, one of the fathers of Venezuelan independence, unsuccessfully launched the first major organized effort at revolution (10:31).

Independence (1810-1830). The initial phases of Venezuela's independence began in Europe in 1808. Napoleon I deposed the Spanish king, Ferdinand VII, and replaced him with Joseph Bonaparte. The Creoles in the Cabildo of Caracas declared their loyalty to Ferdinand and formed a junta to rule in his name (9:100). They proceeded to remove both captain-general and intendant, and seize executive power. In April 1810, the Venezuelan political revolution reached a peak by the ouster of Vicente Emparan, last of the Spanish colonial governors of Venezuela (12:27). In 1811, the congress debated at great length the wisdom of continued loyalty to Ferdinand VII and the possibility of declaring Venezuela as an independent state. On July 5, 1811, Venezuela declared its independence when 38 of the 44 deputies voted to make Venezuela a free nation (15:126).

Royalists (Venezuelan forces loyal to the Spanish crown) opposed to the decision touched off revolts that opened up ten bitter years of bloody civil war. From

1811-1821, colonialism fought nationalism (12:30).

In 1812, Francisco de Miranda was named the Republic's supreme military commander and was granted dictatorial powers. Within four months, he was defeated by the Spanish and with the fall of the First Republic, leadership of the revolution passed to Simon Bolivar (10:33). In the next few years, Bolivar was twice forced into exile during his "war to the death" with the Spanish. In 1817 he led his army across the Andes and in a span of four years, defeated the Spanish armies in Colombia, Ecuador and Venezuela, his final victory coming in the battle of Carabobo in 1821. By this time, Bolivar had enough power and influence in the region to unite the three countries into the Republica de Gran Colombia. Bolivar became the nation's first president, as time progressed, he proved less capable as a president than he had as a general. In 1830, a few months before he died, he resigned as president. Subsequently, Venezuela, Colombia and Ecuador became separate nations (9:101).

The Caudillo Years (1830-1935). The Venezuelan constitution which was drawn up upon Venezuela's independence in 1830, allotted a large amount of power to the national government and especially to the executive branch (12:38). This constitution began a period of over one hundred years in which Venezuela would be ruled by strong military leaders or Caudillos (dictators). These Caudillos controlled elections, stifled the press, and terrorized any opposition to their rule. They generally

ignored social and educational reforms and exploited the nation's wealth for their own gain (9:101).

Jose Antonio Paez was elected president of Venezuela in 1831. Paez was a military hero and patriot and was a powerful military associate of Simon Bolivar (12:37). The major accomplishments during the years of his rule were the country's recuperation from the devastation caused by the war for independence, the establishment of foreign credit, and an expansion in domestic construction (10:34). The first term of President Paez ended and in 1835 he was succeeded by Jose Vargas. Although highly regarded by important people in society, Vargas did not have the confidence of the military officers under him and subsequently, he was forced to resign. Paez was then elected to another term of office from 1839-1843, followed by Carlos Soublette, a prominent and socially important conservative, who was elected president and ruled from 1844-1848 (12:41).

Except for a few brief military insurrections, the Paez-Soublette era was generally progressive and prosperous. Schools were built, roads were constructed, and foreign credit was established. There was greater freedom for trade and economic activities and the old colonial tax system was abolished and replaced by a modernized system which was no longer based upon monopoly and privilege (10:37).

Towards the end of the Paez-Soublette reign, the appearance of the Liberal party and the rise of the Monagas

family shaped the upcoming Caudillo leadership that would take the country into the years ahead. General Jose Tadeo Managas was elected president in 1846, and at once strengthened his personal hold over the army and appointed weak Liberal ministers to his cabinet who would not oppose his appointments to key government positions. Succeeding Jose Tadeo in 1851, was his brother Jose Gregorio, who ruled until 1855. Jose Tadeo then resumed the presidency after his brother's rule ended. When Jose Taedo attempted to change the constitution in 1857 to allow him to succeed himself, he was overthrown and exiled. In general, the two Monagas brothers did very little for Venezuela, but a great deal for themselves and their friends. The nation's credit declined, the economy stagnated and promised social and economic reforms were not honored. However the administration of Jose Gregorio must be given credit for the freedom of all slaves in 1854, a decade before the United States emancipated its slaves (12:43).

After the overthrow of Jose Tadeo Monagas, civil war erupted in Venezuela. For five years, the War of Federation represented a fight between the ideals and platforms of the Liberals and Conservatives. The Federal War ended on June 6, 1863 with the ratification of the treaty of Coche (13:170). However, shortly after the treaty another period of protracted violence broke out known as the Blue Revolution (10:35).

In 1870, Venezuela came under control of Antonio Guzman

Blanco, a liberal whose rule would last until 1888 (9:101). Within two years of taking power, Blanco destroyed all political opposition through the employment of press censorship, terrorist tactics and rigged elections. He also eliminated the wealth and influence of the Catholic church by confiscating their land and abolishing their privileges. On the other hand, Blanco did restore the nation's credit, created a nationwide system of public primary education and accomplished an impressive public works construction program (10:35). Another decade of anarchy followed the overthrow of Blanco until General Cipriano Castro assumed power in 1899. For almost half a century, from 1899 to 1935, Venezuela was dominated by two men. The dictatorships of Cipriano Castro (1899-1908) and Juan Vicente Gomez (1908-1935) transformed Venezuelan history and modified political, moral and economic habits (13:182).

Within a few years, Cipriano Castro, one of Venezuela's most corrupt dictators, brought the country to the brink of bankruptcy (9:101). In 1902 he created a major international incident when he refused to honor his nation's foreign financial obligations. The offended countries of Great Britain, Germany and Italy blockaded the nation's ports in order to put pressure on the Castro regime to honor its debts. The whole matter was finally brought before the International Tribunal at the Hague in 1906. Venezuela was ordered to give preference to the blockading countries in paying its creditors (12:50). In 1908 the government was

seized by Juan Vicente Gomez when Castro was required to step down as a result of poor health. Gomez restored the economic prosperity of the country by increasing foreign trade and paying off the interest on the nation's foreign and domestic debt, something his predecessor had failed to do. In 1914 the first commercial oil well began pumping oil from Lake Maracaibo and by 1918, the Gomez government had passed laws that allowed foreign oil companies to expand their investments. Petroleum transformed Venezuela's economy from primarily agricultural to one dominated by the extraction of oil. By 1928, Venezuela had become the world's second leading producer of oil and first in oil exports (10:37). Under the authoritarian rule of Gomez, little of the new wealth was spent on programs to benefit the general population such as education, health, agricultural or industry. Instead, a significant portion went to Gomez and his supporters. Gomez had his political enemies imprisoned, tortured and shot and as a result of this repression, a determined although ineffectual opposition was created. After the student revolt of 1928 in which many were killed, wounded or imprisoned, Gomez became even more ruthless. With the help of an abundance of willing supporters, the dictator established an unchallenged one-man rule until his death on December 19, 1935 (10:37).

After the death of President Gomez violence erupted as mobs attacked and killed Gomez supporters and officials. In Maracaibo, oil installations were looted and destroyed, for

it was the oil industry that the people felt had made Gomez rich. The violence was simply reactionary in nature, and lacking organization and leadership, was soon defused. Congress moved to choose an interim president to serve the remainder of Gomez' term. They selected General Elezar Lopez Contreras, who had been minister of war under Gomez (10:38).

The Transition Years (1935-1958). In April 1936, Elezar Contreras was elected by congress to serve a five year term as president (12:58). Aware of the trends taking place in the country, Contreras made a number of moves allowing the population a greater degree of freedom. A new constitution drafted in 1936 set the president's term at five years and allowed for limited suffrage and indirect elections. He disbanded much of the repressive police organizations established by Gomez, freed political prisoners, and allowed those exiled by his predecessor to return. He also relaxed censorship of the press and allowed political parties to organize (10:39). At the end of his term in 1941, Contreras' handpicked successor, General Isaias Angarita Medina was elected president. Medina pressed for further economic reforms, construction reached an all time high, and the nation passed its first income tax and social security legislation (13:208-211).

In October 1945, a group of young army officers, in collaboration with members of the Accion Democratica (AD) party, took over the government and set up a civil-military

junta to transform Venezuela into a "showcase of reformist democracy" (15:223). AD and its military collaborators had found the traditional political system too strong and inflexible to permit the rapid changes they believed necessary. The free elections promised by the junta took place on December 14, 1947 and resulted in the election of the AD party candidate Romula Gallegos. The opposing candidate of the Social Christian Party, Komite por Organizacion Politica y Electoral Independiente (COPEI), lacked the strength and organization to pose a serious threat (12:60). The Gallegos administration moved to establish policies that would allow the government to exercise some control over foreign oil companies. Production had increased so rapidly that in 1948 petroleum revenues amounted to well over \$400 million (10:41). However, President Gallegos' term was short-lived. On November 24, 1948 the military seized power in a bloodless coup. The downfall of Gallegos resulted from his refusal to appoint military members to cabinet positions and from his failure to form a coalition government with COPEI. A military junta ruled the country until 1952 (9:101). In that year, after falsifying unfavorable election results, Perez Jimenez became the nation's president. Jimenez was a throwback to the harsh dictators that had earlier dominated the country for over a century. He established a secret police force that was characterized by its brutality and harshness. Government corruption was widespread with at

least 50 percent of the government's funds during the Jimenez years either stolen or squandered. With the increased debts incurred by Jimenez, rumors of orgies in high places and a sham reelection, Jimenez lost his last stronghold of support - the military (10:44). On January 23, 1958, President Jimenez fled the country in the face of open military revolt. The subsequent governing junta moved quickly to establish democratic elections. On February 13, 1959, Ramulo Betancourt, AD party candidate, was inaugurated as president (15:239). He would be the first democratically elected president to serve a full five year term. The nation thus entered a new era (10:44).

The Democratic Years (1958-Present). In October 1958, the leaders of the three prominent political parties signed the Punto Fijo Agreement, which stipulated that whatever party's candidate won the presidency, a coalition government would be created including the other two parties (10:44). As a result of this cooperation, and Betancourt's strong democratic government, the country was able to withstand leftist guerrilla attacks perpetrated by Cuba's Fidel Castro and a number of military coup attempts. Betancourt reduced corruption in the government and funneled oil revenues into much needed agricultural and educational programs. In 1960, Venezuela's Minister of Mines and Hydrocarbons, Perez Alfanzo, led the way in creating the Organization of Petroleum Exporting Countries (OPEC) (15:285).

On March 11, 1964, Dr. Raul Leoni of the AD party was

inaugurated as president of Venezuela. Leoni's administration continued the economic and political policies of the previous regime. In 1964, Venezuela broke relations with Cuba as a result of aid provided by Castro to Venezuelan subversive groups (15:286). In 1967, over considerable opposition from the business sector, Venezuela entered the Latin American Free Trade Association which committed the country to economic integration with other countries in the region (10:45).

The elections of 1968 saw COPEI's founder, Dr. Rafael Caldera, win the presidency. Caldera moved quickly to establish relations with the Soviet Union and other Eastern European countries. He also continued social welfare and education programs. In the early 1970's, Congress increased taxes on foreign-held oil companies and brought them under government control (9:101). In July 1973, the government nationalized the natural gas industry (15:287).

In the elections of 1973, AD regained control of the executive office when Carlos Andes Perez won with 49 percent of the popular vote (10:46). In April 1974, Perez announced the nationalization of the iron industry. In August of 1975 Perez signed a law nationalizing the petroleum industry. PETROVEN (Venezuelan Petroleum), the government holding company, finally took control of all petroleum companies in January of 1976. Perez continued the foreign policies of Caldera by visiting the USSR in 1977 to discuss economic and industrial cooperation (15:287).

The elections of 1979 saw COPEI candidate Luis Herrera Campins win an overwhelming victory with well over 50 percent of the vote (9:101). The administration, faced with falling world oil prices and cutbacks in petroleum exports, attempted to diversify the economy in an attempt to reduce Venezuela's dependence on oil revenues. In July 1982, Energy and Mines Minister Berti announced that Venezuela would no longer adhere to production quotas established by OPEC. Herrera strengthened U.S.-Venezuela relations by purchasing 24 advanced F-16 aircraft in an agreement that was signed in May 1982, giving the Venezuelan Air Force the most advanced aircraft in Latin America. However, relations then worsened when the U.S. and Venezuela supported opposite sides during the war between Argentina and Great Britain over the Falkland Islands (17:586). However, this change in relations had little impact on the F-16 sale.

Jaime Lusinchi of the AD party began a five year term as president on February 2, 1984. In the December 1983 elections, Lusinchi received over 56 percent of the vote, the most by any candidate since 1947. The most immediate problem facing the Lusinchi administration when it came into office was the need to bring interest payments on the foreign debt up to date. The previous administration had failed to reach an agreement with the International Monetary Fund (IMF) because their demands were deemed unacceptable. Devaluation of the country's currency (the Bolivar), wage and hiring restraints, and removal of subsidies on gasoline

and essential food items would have been required. In May 1985, a tentative agreement on the foreign debt was reached between Venezuela and 450 international banks, with the formal signing taking place in New York on February 26, 1986 (18:6). Repayment of the \$35.2 billion would be stretched over the next 12 years. The creditors agreed to the debt renegotiation without obligating Venezuela to submit itself to an IMF adjustment program. However, Venezuelan officials did agree to semi-annual reviews of the country's economic policies by the IMF (19:558). Despite the current economic problems, Venezuela remains the strongest democracy in Latin America.

Social Environment

The characteristics of Venezuela's social environment can be grouped into the following categories: population, class structure, health and education, and religion.

The Population. Venezuela's officially estimated population in 1985 was 17.81 million people with an annual growth rate of 3.1 percent per year, one of the highest in the world (20:1). The urban population has been growing by almost five per cent annually. The rural population has grown very little. As a result, by 1985 about 83.3 per cent of the people lived in cities. Caracas, the nation's Capital and largest city, has been growing rapidly. In 1985, it had a population of 2,664,225 people (20:2). Maracaibo was, until the oil boom, a small town with only a

few thousand inhabitants. It had 818,000 people in 1985 and is Venezuela's second largest city (19:97). In contrast to these densely populated urban areas, the rest of the country is only sparsely settled. The Sierra de Perija, in the northwest along the the Colombian border, is inhabited by Notilan Indians, who have had little contact with the outside world. The largely isolated Llanos and Guayana Highlands contain only about 15 per cent of the country's population, including some 25,000 primitive Indians living in the jungle (9:96). The population density of Venezuela is approximately 50.6 inhabitants per square mile (20:1). Venezuela proudly considers itself "triethnic", a fusion of three major races: South American Indian, Caucasian, and black. About 67 per cent of the population are Mestizo, a mixture of Spanish and Indian descent. About 20 per cent of the people are white, and about eight per cent are black, the latter category including Zambos of mixed black and Indian ancestry, and mulattoes, of mixed black and white ancestry. About five per cent are pure Indian, most of whom live in remote areas and retain their traditional way of life, having little contact with the modern world (8:1). The age distribution of the population is as follows: 0-14 years - 42.8 percent, 15-59 years - 52.4 percent, 60 years and over - 4.8 percent. Median age of the population is 18.7 years. The life expectancy for males is 64.6 years and for females is 68.3 years. This gives Venezuela the longest average lifespan of any tropical country in the world

(21:14). Spanish is the official language, with Indian languages spoken by some of the 200,000 Indians living in the remote interiors of the country (21:14).

Class Structure. A class consciousness was established centuries ago and has been developed over a long period of time.

In the colonial era, there was considerable competition between the Spanish "Peninsulares" who were born in Spain and maintained the privilege of public office, and the "Creoles" who were of Spanish origin but were born in the "colonies". As a result of their distrust of the Creoles, the Peninsulares governed and kept the higher offices for themselves. Although they owned land and were wealthy, the Creoles became more and more dissatisfied because they were not allowed to govern their own country. They hated the Peninsulares, calling them "Gachupines" (ruffians) or "Godos" (barbarians) (21:15). Spanish aristocrats of the early 19th century emphasized their high positions by passing laws giving them the exclusive right to wear capes, mantles, lace and pearls. They also kept the exclusive rights to education, membership in the clergy, and advancement in the army (10:51).

For hundreds of years there were only two social classes: Gente Decente (decent people) meaning the rich, elite, educated and powerful, and the Gente Cualquiera (common people), the illiterate and poor. There was no middle class because education was denied to all except

those in the upper class. Eventually, the Creoles and Peasants banded together against the Peninsulares to gain recognition. However, they continued to have no place in society because Venezuela largely remained a feudal society with the Hacienda the basic social unit. Workers had tiny plots of land from which they fed themselves, the cities and provided for their landowners. When the oil boom occurred, landlords invested most of their money in petroleum, deserting the land and allowing the farms to deteriorate and the workers to become unemployed. Today's rich continue to hold onto their wealth by hiding their money outside the country, and resisting state taxes. They still reluctantly share to the "inferior" classes and as a majority, are still not responsive to the needs of the nation. The poor, on the other hand, are politically aware, conscious of the rising standards of living, and feel a stake in the profits of the country. The poor, both urban and rural, are a long way from being the submissive peons their ancestors were (10:56-59).

Although Venezuela's social structure is changing, traditionally it has included an upper class, a middle class, and an urban and rural lower class (10:60-63).

--The upper Class. The upper class has expanded from a small agricultural elite into an urban class whose wealth and power extend through many sectors of the economy. Wealth is the most important determinant of social status. However, ethnic heritage and family name have remained

important also. The large number of family owned businesses emphasize the dominance of the upper class in the overall economic system. Those included in this class resist all social leveling and consider themselves the "ruling class" (21:17).

--The middle class. The middle class is regarded as the most dynamic and heterogeneous class in Venezuelan society. It is almost entirely urban and includes such professions as industrialists, teachers, small businessmen, government workers and professional people (21:17). Previously, the middle class represented a catchall category for those having very little in common except nonmembership in either the upper or lower classes. Today, however, the middle class is becoming increasingly defined. The individuals in this class are supporters of both major political parties and are the main group guiding the political future of Venezuela. they are nationalists for the most part and have actively supported the independent course their government has taken in recent years (10:61).

-- The urban lower class. This class includes the ordinary people - the servants, traders, laborers and the population of unemployed or marginally employed squatters of the large cities. The lower class is associated with manual occupations, poverty and illiteracy. Political participation ranges from leftist communist groups to the more conservative and moderate political parties. As such, they have little impact on the country's politics except as

individual voters. Families in the working sector tend to be fairly stable with emphasis placed on the mobility of the individual family. Parents in this group foster child-rearing practices that will help their children adapt to working class, or hopefully, even middle class lifestyles, emphasizing cleanliness, respect for authority and the importance of education (10:63).

--The rural lower class. Rural social life has been formed by an agricultural-dominated economy that has seen little change since colonial times. Most of the rural population live in poverty, primitive housing, and have low nutritional standards. The majority of peasants are wage laborers, sharecroppers or squatters who produce no more than that required for subsistence. Primitive technology and geographic and cultural isolation of the rural population has been a barrier to social change. Neglect of rural education and immobility of the people has left the rural peasant almost entirely outside the range of national influence (10:65).

Health and Education. Since 1936, a national health program has made Venezuela the world's largest malaria-free tropical area. Many diseases, once prevalent in the country have been controlled (8:7). Health standards among the upper and middle classes are good, but for the lower urban class, sanitation and health is poor in the shack communities that surround the cities. Infectious hepatitis, amebiasis, and other intestinal problems are frequent. Many

of the large cities have respected general practitioners and specialists with several clinics and facilities similar to well-equipped U.S. hospitals (8:6). World Health Organization statistics show 27.4 hospital beds and 9.8 doctors per 10,000 people and an infant mortality rate of 31 per 1,000 live births (20:2).

Education is free and compulsory for individuals between 7 and 14 years of age (9:98). Venezuela has historically suffered from a shortage of schools and teachers however, improvements have been made in these areas in recent years. The literacy rate, once below 50 percent, has now risen to 86 percent (20:2). Venezuela's six public universities are free. Prior to 1970, the universities were autonomous. In that year, congress, reacting to widespread demonstrations and violence at the universities, approved legislation bringing university administration and curriculum under government control (9:98). During fiscal year 1985, about 16.3 percent of the national budget was spent on education (20:2).

Religion. In 1985, some 96 percent of the people in Venezuela were Roman Catholic, about two percent were Protestant and about 0.1 percent were Jewish (20:2). A small number of Indians continue to practice their traditional religions, but many are adopting to Catholicism (10:71).

Relations between the church and state have been good throughout most of the 20th century and have continued

during the 1980's. Although there is no official state church, the Catholic Church has close ties to the government and in effect, functions as the national church (10:72). Through a series of agreements with the government, the Church has been assigned regions in the remote parts of the country in which to do missionary work. The state's principle interest is in the civilizing force the missions exercise through schools established in each region (10:73).

One of the most important and significant areas of church involvement in society is in education. Children from upper and middle class families have traditionally been educated in Catholic schools. However, since many of these schools were supported strictly by tuition fees, this type of education was out of reach for the majority of those in the lower classes. Today the situation has changed. Many schools aimed at educating the children of the lower class have been established in urban areas. In addition, slightly more than two-thirds of Catholic schools and colleges are free or partly free (10:72-73).

Economic Environment

Venezuela is one of South America's wealthiest nations. Its gross domestic product (GDP) in 1985 was \$70.82 billion, some \$4,046 per capita, the highest in Latin America (19:589). Four key industries support Venezuela's wealth; petroleum, mining, manufacturing and agriculture.

Petroleum. Petroleum is and has been the dominant

force in the Venezuelan economy since World War I. The petroleum industry accounts for 95 percent of merchandise export earnings, nearly 65 percent of government revenues, and 17 percent of the GDP (8:4). PETROVEN, which assumed control upon nationalization of the industry in 1976, is the government holding company which administers Venezuela's oil industry. It is an autonomous state corporation consisting of six different companies (21:24). The oil on which the country's economy is based is pumped from three major oil producing areas. About three-fourths of the output comes from the Maracaibo oil basin consisting of the northeast part of Lake Maracaibo, and the Maracaibo and Mara districts northwest of the lake. The second area is the Orinoco basin south of Puerto La Cruz. The third area, which is the newest and smallest, is the Apure-Barinas basin in the southwest. Proven reserves in these fields amount to approximately 18.6 billion barrels (10:146). Venezuela has an additional source of potential wealth unmatched anywhere in the world. Known as the Orinoco Heavy Oil Belt, it consists of an immense deposit of highly viscous oil. It is an area 275 miles long and ten to forty miles wide with an estimated total content of possibly three trillion barrels. However, development of this reserve would require new technologies since the oil is impregnated with impurities and does not flow below 45 degrees Celsius (10:20).

For too many years Venezuela has been overly dependent upon oil. The current glut in world oil supplies and the

recent rollback in oil prices have slashed Venezuela's oil revenues by \$5 billion (22:12). The government, committed to high levels of expenditures, borrowed heavily from foreign sources to meet its commitments. The total debt in 1985 reached \$35.2 billion (23:75). In an attempt to promote foreign investment and develop non-oil exports, President Lusinchi has proposed measures to limit government intervention in the economy and promote a greater role for private business (24:8).

Mining. Venezuela has a variety of mineral deposits such as iron ore, gold, diamonds, copper and bauxite (20:3). Only iron ore has been extensively exploited with nearly all of the iron produced coming from two large mines in the Guayana Highlands (10:150). With proven reserves of over 1.5 billion metric tons, Venezuela's iron ore exports ranked second in value to those of petroleum (21:25). Other minerals which play an important role in the economy include large deposits of low-grade industrial diamonds in the Guayana Highlands, gold at El Callao in the state of Bolivar, and large coal reserves from the Lobatera mines in the state of Tachira (10:151).

Manufacturing. The manufacturing industry in Venezuela has expanded rapidly in recent years due to large government subsidies. This has been in an effort to lessen Venezuela's dependence on petroleum revenues and imported manufactured goods. At the present time, industrial manufacturing contributes 17.3 percent of the GDP and employs 16 percent

of the labor force (20:3). One of the major industries is the manufacturing of textiles. Cement is made in quantity to supply the rapidly expanding construction industry. Highway and housing construction have become some of Venezuela's most important industries (9:94). Most of the country's manufacturing industries are located in the coastal areas, particularly in Caracas and Valencia. Moron is the site of an important petrochemical plant. Another important industrial complex is developing in the Guayana Highlands along the Orinoco River to take advantage of that region's vast natural resources. Matanzas is the site of the Orinoco steel mill which produces seamless steel tubing for the petroleum industry and various other steel products for domestic industries and for export (9:95).

Agriculture. Agriculture employs approximately 15 percent of the labor force however, Venezuela produces only about two-thirds of its food needs (21:26). This underproduction is mainly a result of the use of antiquated agricultural methods. For years, landowners preferred to invest their money in oil and minerals rather than buy modern farm machinery or improve the land. Only since the 1950's have fertilizer and machinery been used (9:93).

Coffee, the country's leading cash crop, is grown on the lower mountain slopes. Tachira State, in the Sierra Nevada Highlands, is Venezuela's leading coffee-growing region. Cacao, the second most valuable crop, is raised mostly on the damp lower slopes of the Andean coastal

ranges. Most of the coffee and cacao grown in the country is exported (9:93). Corn occupies more land than all other crops combined and is raised primarily for domestic consumption. Other crops grown include sugarcane, cotton, rice, sisal hemp, and citrus fruits. Cattle raising and dairying are important activities in the Valencia Basin and in the Maracaibo lowlands (9:93).

Government and Political Structure

Venezuela is a federal republic consisting of 20 states, two federal territories (Territorio Delta Amacuro and Territorio Amazonas), 72 Caribbean islands administered as dependencies, and a federal district where Caracas, the national capital is located (9:98). The states have some power but, governmental authority resides almost exclusively in the national government. The current constitution was adopted in 1961, three years after the last military government was replaced by a civilian one (20:7). The constitution provides for the separation of executive, legislative and judicial powers with executive power vested in the president (25:1). Much of the constitution deals with an elaboration of individual and collective rights and duties. Six chapters deal with human rights and freedoms such as freedom of speech, press and religion. The right of habeas corpus is also recognized and the constitution prohibits self-incrimination, torture, capital punishment, and double jeopardy as well as discrimination on the basis

of sex, race, creed or social status (10:177).

The Executive. The Executive branch of government is headed by the president, who is both chief executive and head of state (10:178). He is elected by direct popular vote for a term of five years. He cannot be reelected to a successive term and must wait ten years until he is eligible to run for president for a second time. The president has enormous power in domestic and foreign affairs. He also appoints the governor of each state and has the power to remove him if necessary (21:20). The president must be at least 30 years of age, a native born Venezuelan and may not be a member of the clergy (9:99).

As in most Latin American countries, the office of the president entails considerable powers. He directs all foreign affairs and is commander in chief of the armed forces. He is responsible for the defense of the national territory and for the organization and operation of the military. He also fixes its size and controls the appointment of its officers. The president also supervises diplomatic personnel and negotiates and ratifies all international agreements and treaties (10:179). The president is assisted in his executive duties by the Council of Ministers, which serves as a cabinet since the country has no vice president (21:20).

There are some constitutional checks on presidential power, in the form of divided and shared responsibilities. The national budget must be approved by Congress, who must

also approve the president's use of emergency powers. Major appointments such as Supreme court justices, the Prosecutor General, and the Comptroller General are made by Congress (10:179).

The Legislature. The Venezuelan Congress is structured similar to that of the United States Congress and is one of the most effective in Latin America. The Congress is bicameral, consisting of the Chamber of Deputies and the Senate (9:99). The Chamber of Deputies is apportioned on the basis of population with each state having at least two representatives and the federal districts one. The Senate is composed of two senators from each state and two from each federal district. Former presidents are also given membership and serve for life (20:7).

The major functions of the legislature are to consider, debate, approve, reject or alter legislation and to oversee the executive branch and its agencies (9:181). The legislature also approves certain presidential appointments to diplomatic posts and promotions of high ranking military officers.

The Judiciary. The Supreme Court of Justice is the highest court in Venezuela. It operates in three divisions: civil, mercantile and labor, each with five members elected by Congress for a term of five years (20:7). The Supreme Court has relatively broad powers in disagreements that involve the Republic, a municipality or a state.

At lower levels, the country is divided into 17

judicial districts, each having a superior court. Lower courts within a judicial district include courts of first instance, municipal courts, district courts and courts of instruction (20:7).

Political Parties. All of the nation's approximately 40 political parties are recent creations. Despite the large numbers, Accion Democratica (AD) and Comité de Organización Política Electoral Independiente (COPEI) with their slightly left of center views, have been the dominant parties since 1959 (10:186). Certain other parties constitute a portion of the opposition to the democratic parties. They are the Movimiento al Socialismo (MAS), a socialist party advocating "Eurocommunist" positions and the Movimiento Electoral del Pueblo (MEP) (20:8). This opposition has been so small and fragmented that it has not posed a serious threat to either of the two major parties. In the third group are the leftist revolutionary parties. The two most notable are the Partido Comunista Venezolano (PCV), which is the highly Soviet-oriented Venezuelan Communist party, and the Movimiento de Ezuierda Revolucionaria (MIR) which follows the philosophy of Cuba's Fidel Castro (9:187). They have had some impact on the government despite their limited support and participation.

National Security Requirements and Military Structure

Venezuela's foreign policy has focused primarily on the continuation of the nation's role as a leader in the

international oil market, preservation of Venezuelan democracy, the consolidation of the national land, air and maritime boundries and its continuation as a major stabilizing force in the Caribbean region. The sale of the 24 F-16 aircraft by the United States will assist Venezuela in achieving these objectives. However, Venezuela faces a variety of internal and external threats.

Internal Threats. The petroleum industry is the keystone of the Venezuelan economy. Due to the recent world oil surplus and price cuts, the economy is facing a severe crisis. Inflation, as low as 7.7 percent in 1982, has now risen to 25 percent in 1986 (22:9). The unemployment rate has risen substantially as have interest rates and the foreign debt. The general future uncertainty of the economy has eroded social loyalties and led to intensified political conflicts with the opposition parties (26:5).

After the establishment of a democratic government in 1958, Communist and leftist parties formed a coalition in an unsuccessful attempt to overthrow the newly formed government (27:7). By 1962 the Communists had formed a front to wage a campaign of urban and rural terrorism. In 1963, they attempted to disrupt the presidential elections but failed (28:4). In the 1980's, guerrilla activities continue, however, they do not constitute a major problem. They have consisted of isolated instances of bank robberies, attacks on police, kidnappings and oil field sabotage (29:715).

External Threats. At the present time, Venezuela faces no direct external threats. There have, however, been continuing border incidents with Colombia and Guyana. The disputes with Colombia have dealt with illegal immigration; it has been reported that some Colombians attempting to enter Venezuela in search of jobs have been killed by immigration officials (25:10). Conflicts have also continued over the division of the oil rich waters in the Gulf of Venezuela, which both Colombia and Venezuela have claimed since the 1800's. Tensions with neighboring Guyana have increased following the expiration of the Port of Spain Protocol signed in 1970. This agreement froze Venezuelan claims on the Essquibo region of Guyana, which accounts for 65 percent of that country's area (Figure 4) (25:10). The area in question contains significant deposits of precious metals and is rich in potential hydroelectric power from the Mazaruni River. Caracas has stated that it will seek a peaceful solution to the disputed area and will not resort to military force as Guyana fears (25:10).

The significance of Latin America in Soviet strategy is irrefutable. The USSR has encouraged, directed and planted leftist groups in countries where Moscow sees a potential for bringing revolutionary regimes to power (30:87). The Soviet Union has avoided visibility and protected itself from negative repercussions by using Cuba and Nicaragua as the instruments to carry out its strategy in Latin America. Cuba possesses an imposing array of sophisticated weapons



Figure 4. Disputed Area With Guyana

supplied by the Soviet Union such as, MIG 23 aircraft, OSA class patrol boats, submarines, hydrofoils, transport aircraft and KONI class frigates (4:73). The weapons in Cuba's military arsenal allow it to project its power over much of the Caribbean region. The Sandanista victory in Nicaragua in 1979 gives Moscow a foothold in Central America from where it can export its brand of Communism to other countries in the area and into South America.

Military Structure. The president is the commander in chief of the armed forces which consist of four independent services: the Army, Navy, Air Force and the National Guard. The president's principle advisory body is the National Council of Security and Defense comprised of the ministers of the interior, foreign affairs, national defense, the inspector general of the armed forces and the chief of the joint staff (10:255). The president administers the armed forces through the minister of defense, who is usually chief of the joint staff (25:2). The minister of national defense is an extremely powerful position with virtually every major unit reporting directly to his office. The current structure has grown from traditional rivalries between the services and has resulted in considerable autonomy for each branch despite the existence of the joint staff structure (10:255).

The Army. The Army consists of 34,000 personnel divided into one light and three medium tank battalions, two mechanized infantry battalions, 11 heavy infantry

Table I
Major Equipment Inventory - Army

Helicopters	Tanks	Armored Veh
12 SA-316 3 Bell 205A 2 Agusta A 109 3 Bell UH-1 3 Bell 206 8 Utility/Liaison 6 Station Air 2 King Air	81 AMX-30 Medium 40 AMX-13 Heavy	15 M-8 85 VIT 38 Urutu
Artillery Weapons		
20 M-18 76mm self-propelled anti-tank guns 15 AMX 155mm self-propelled guns 5 M-101 105mm howitzers 15 155mm M9 howitzers 96 60mm, 81mm, 120mm mortars		

battalions, 13 ranger battalions, five artillery groups, and one mounted cavalry battalion (31:122). This represents an approximate doubling of strength since 1970 due to the creation of the anti-guerrilla ranger units and the expansion of the armored force. The army also includes five anti-aircraft battalions and five engineering battalions engaged in civic action (25:2). Major equipment items include helicopters, tanks, artillery, and armored personnel carriers (Table I).

The Navy. The navy has 18,000 personnel, including

Table II
Major Equipment Inventory - Navy

Watercraft	Aircraft
8 Frigates with Otomat SSM 6 Fast Attack Craft with Otomat SSM 47 Coastal Patrol Boats 3 Submarines	8 S-2E Tracker 1 King Air 2 C-212 1 Dash 7 1 Hawker 1 CE 310R 12 Agusta 212

marines organized into 4 battalions (31:122). The fleet includes submarines, destroyers, destroyer escorts, and patrol boats. Naval aviation is composed of search and rescue aircraft, reconnaissance and patrol aircraft, and helicopters (Table II). Naval headquarters is located in Caracas, with two naval supply bases at Puerto de Hierro and Falcon, and a major naval repair and overhaul facility with drydocks, synchrolifts, and floating cranes located at La Guaira (25:2).

The Air Force. The air force consists of 5,000 personnel which form two bomber/reconnaissance squadrons, a counterinsurgency squadron, three fighter/interceptor squadrons, two transport squadrons and a presidential transport squadron (31:122). The Air Force flies a variety of aircraft, among those the F-16 Fighting Falcon (Table III). Major air force bases are located at Caracas,

Table III
Major Equipment Inventory - Air Force

Bombers/COIN	Fighters	Helicopters
17 Canberra 16 OV-10E	29 CF-5A 15 Mirage IIIE 16 F-16A 9 Mirage 5V	15 SA-316 20 Bell UH-1D 10 Agusta 109 6 Bell 206B 2 Bell 206C 2 Bell 214ST 2 Bell 412
Utility/Liaison	Trainers	Transports
1 Queen Air 12 CE-182N 3 BE-90 King Air 1 Gulfstream II 1 Gulfstream III	24 T-34 22 T-2D 8 F-16B 2 Canberra 8 CF-5B 4 Mirage 5D	2 CE-500 1 HS-74B 1 B-737 8 C-123B 5 C-130H 6 G-222

Maracay, Miaguetia, La Carlota, Maracaibo and Barcelona (25:2).

The National Guard. The national guard is composed of 22,000 personnel and is used for internal security and customs. The national guard operates about 46 coastal patrol craft and a number of helicopters in carrying out its duties (31:122).

Security Assistance

Lacking a significant arms production capability, Venezuela has had to import the majority of its military

equipment. According to the U.S. Arms Control and Disarmament Agency, Venezuela imported \$745 million worth of arms during the period 1978-1982 with Italy being the country's major supplier, followed by the U.S., France, the United Kingdom and West Germany (25:2). Since 1982, the United States has assumed the role as Venezuela's major arms supplier.

U.S. Security Assistance Programs. Venezuela has received no U.S. funds under the Military Assistance Program (MAP), FMS Financing Program or Economic Support Fund during the last four years and none is forecasted for the future. President Reagan has allocated funds for the International Military Education Training (IMET), which has shown steadily increasing levels since 1982 (25:2).

Since FY 1950, Venezuela has ordered nearly \$1 billion through FMS channels, the majority coming in FY 1982 with \$618.274 million worth of orders (25:3). The following is a list of the most recent security assistance programs between the United States and Venezuela:

Peace Charlie - Peace Charlie was the sale of one Cessna Citation II aircraft, specially configured for aerial photography/mapping. Included in this sale was a one year blanket order services and materiel case provided provided from the aircraft manufacturer (32:1).

Peace Picair - The Peace Picair program sold 24 AIM-9P-3 missiles to Venezuela. Included in the program was a modification/retrofit of 15 CF-5 aircraft which would

allow them to fire the AIM-9P-3 missiles (33:1).

Peace Agua I - This program sold one refurbished Gulfstream II aircraft along with a one year blanket order services and materiel case provided sole source from the aircraft manufacturer. This aircraft was purchased for the Venezuelan presidential support fleet (34:1).

Peace Agua II - Peace Agua II was the sale of one new Gulfstream III aircraft. Included in this sale was a one year blanket order services and materiel case to be provided sole source from the aircraft manufacturer. The aircraft sale is one of a total of four system sales comprising the Venezuelan presidential support fleet (35:1).

Peace Agua III-B - This was a \$3 million program for two years worth of support for the presidential Boeing 737 aircraft. The first scheduled maintenance was completed in September 1984 at the Wichita, Kansas facility (36:1).

Peace Spirit I - This program sold two Bell helicopter model 412s. Included in this sale was a one year blanket order services and materiel case to be provided sole source from the aircraft manufacturer. These two helicopters comprise one of the systems of the Venezuelan presidential support fleet (37:1).

Peace Spirit II - Peace Spirit II was the sale of two Bell helicopter model 214STs. Included in this sale was a one year blanket order services and materiel case to be provided sole source from the aircraft manufacturer. These helicopters are also part of the presidential aircraft fleet

(38:1).

Peace Spirit III - This included follow-on nonstandard support of Bell helicopters, models 412 (Peace Spirit I) and 214ST (Peace Spirit II) (39:1).

Peace Delta - This \$615 million program was the sale of 24 F-16 aircraft, 18 F-16As and 6 F-16Bs, to the Venezuelan Air Force, Fuerza Aerea Venezolana (FAV). Six aircraft were to be delivered on an accelerated basis by third quarter 1983. This agreement also included a Cooperative Logistics Supply Support Arrangement (CLSSA) and called for contractor interim support (CIS) by General Dynamics until March 1985. This was recently extended through 1987. This extension will place an emphasis on training rather than maintaining the aircraft (40:1). The final aircraft was delivered to the FAV in November 1985, however, some problems exist within the program that limit its effectiveness. These problems can be attributed to the accelerated delivery schedule agreed to in the original letter of offer and acceptance (LOA).

Other significant foreign military sales to Venezuela have included 19 OV-10E Bronco aircraft delivered in 1975 at a cost of \$449,000, nine C-130s purchased for \$40 million, a Boeing 737 and a McDonnell Douglas DC-9 for presidential and VIP support, and eight Grumman S-2E Tracker aircraft bought in 1976 at a cost of \$567,000 (41:1-4).

IV. Peace Delta

Overview

The F-16 Peace Delta program accelerated the delivery of new production F-16 aircraft and associated logistics support elements and provided early integration of the F-16 weapon system into the Venezuelan Air Force. The first six aircraft (three F-16As and three F-16Bs) were delivered in-country on 16 November 1983. Subsequent deliveries of 18 aircraft (15 F-16As and 3 F-16Bs) were completed in 1985 with the final delivery of six aircraft in November 1985 (42).

In April 1981, headquarters Air Force Logistics Command was informed of the Republic of Venezuela's interest in purchasing the F-16 aircraft. On 5 August 1981, the International Logistics Center at Wright-Patterson AFB, Ohio, was tasked with the responsibility of providing price and availability data involving a 24 aircraft program for a possible FMS sale to Venezuela (43:1).

Prior to this time, in 1980, the Venezuelan air force had performed a thorough study before requesting the F-16 aircraft from the United States. In the course of their study they evaluated, in addition to the F-16, the French Mirage MIR-50, The Israeli KFIR C-2, the British Tornado and the Northrop F-20 (44:53). Based on each aircraft's performance parameters, available systems and other descriptions, a four step approach was used in the

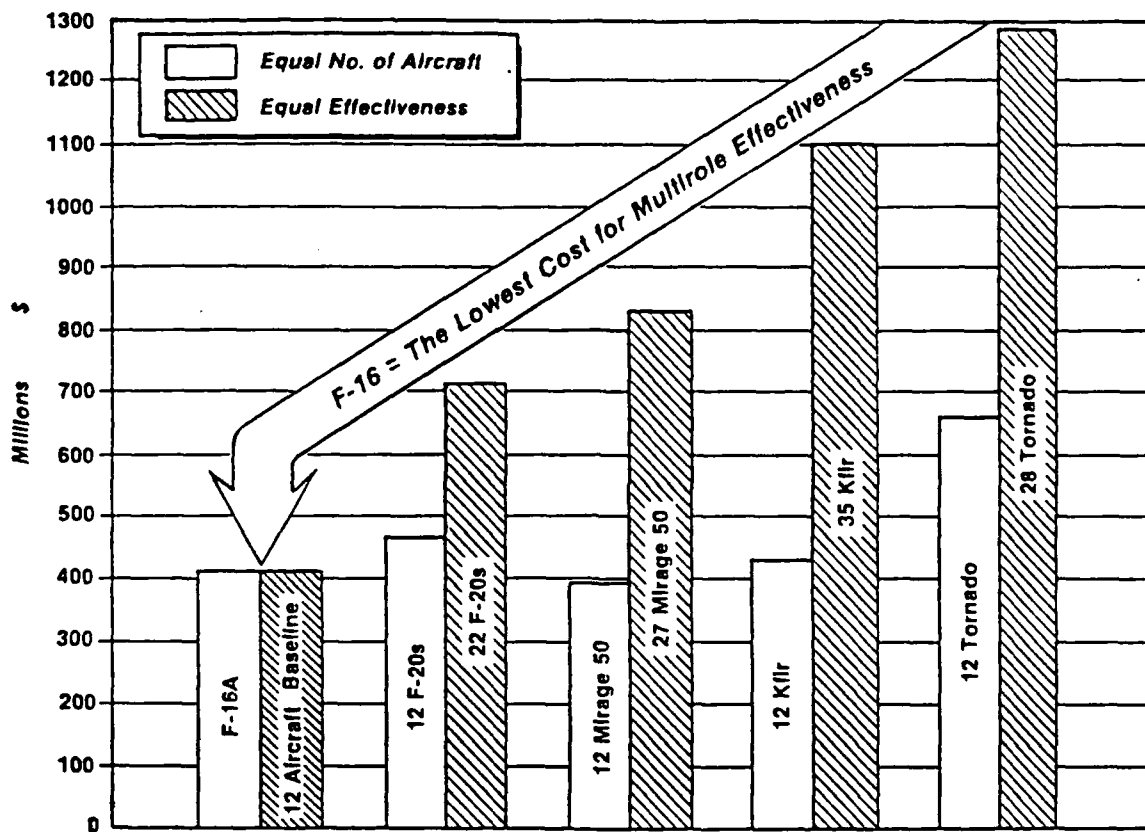
evaluation process. First of all, each aircraft was evaluated on its combat mission effectiveness in both the air-to-air and air-to-ground roles. Second, based on equal effectiveness, a determination of the size of the combat force required was performed. Third, a cost evaluation was performed based on initial unit procurement costs and unit operations and support costs. Finally, aircraft were ranked on relative total cost and equal combat effectiveness (44:52). Based on their study, the FAV selected the F-16 (Table IV), which they believed to be the aircraft which would take them through the 1990's to counter any possible national threats (44:52).

In July 1981, president Reagan gave his approval for the F-16A/B sale to Venezuela. At this time the FAV requested an LOA for 24 aircraft, 18 F-16A's and 6 F-16B's, from the Department of Defense (45:1). On 5 February, 1982, the Senate met to formally approve the Peace Delta sale (46:1).

Hearing Before The Committee On Foreign Relations United States Senate

The Honorable Charles H. Percy, Chairman of the Committee on Foreign Relations presided over the Senate hearing on the proposed sale of the F-16 to the Republic of Venezuela. Since there was no resolution of disapproval for the pending sale, the main purpose of the hearing was a discussion of certain issues before Congressional approval

Table IV
FAV Aircraft Selection



of the sale (46:1).

The first question concerned the U.S. Air Force's involvement in the sale. Reports had circulated that by quoting price and availability data and allowing Venezuelan air force officers to fly the F-16, the U.S. Air Force influenced the Venezuelan decision to shift away from the F-16/79, to the F-16. The F-16/79 utilized a similar airframe to that of the F-16, however the F-16 was powered by the Pratt and Whitney F-100 engine whereas, the F-16/79 used a less capable engine. Performance of the F-16 was far superior to that of the F-16/79 due to the powerplant difference (46:2).

The second issue was concerned with a possible increase in additional requests from other middle income countries to buy advanced aircraft as a result of the proposed Venezuelan sale. If in fact this did occur, it would be more difficult for the United States to reject such requests and would jeopardize the United States' position on arms control (46:2).

The third question related to the future of the FX (export fighter) concept. If advanced aircraft such as the F-16 were sold to Venezuela, would there still be a market for the FX? Congress had strongly supported the FX concept as an arms control instrument (46:2).

Finally, what impact would the sale of the F-16 to Venezuela have on the immediate region? What are the threats that Venezuela faces and how will those countries

bordering Venezuela react (46:2)?

The Honorable James L. Buckley, Under Secretary of State for Security Assistance, Science and Technology, Department of State proceeded to discuss the Venezuelan request to purchase the F-16 and explain why the Reagan administration had approved the request. In the course of his testimony, Secretary Buckley addressed the four issues previously raised by Senator Percy (46:3).

The proposed sale of the F-16 to Venezuela was in line with president Reagan's conventional arms transfer policy. As president Reagan's directive stated, "Prudently pursued, arms transfers can strengthen us" (46:4). First, by helping countries located in strategic areas to help themselves, we can relieve our own forces of responsibilities they might otherwise have had to assume alone. Second, we complement the capabilities of our own forces by supplying other friendly countries with modern equipment and compatible facilities. Third, by showing the United States as a reliable supplier of needed materiel, we strengthen our ties with allies and those nations which share the same ideals as our own country. In the case of Venezuela, the United States had the opportunity to enhance the stability and future defense of a friendly democracy located in a strategic region in the western hemisphere (46:5).

Brigadier General Henry J. Sechler, Director of International Programs, Deputy Chief of Staff, Programs and Resources, U.S. Air Force briefed the committee on the first

issue raised by Senator Percy, that of the U.S. Air Force's role in the sale. He stated that after the Venezuelan Air Force had completed their study on a future fighter aircraft purchase in December 1980, they requested a visit of the General Dynamics facility at Fort Worth Texas. Venezuelan Air Force representatives also wanted to visit an operational F-16 base, Hill AFB, Utah. The request was processed and approved by the State Department and the Office of The Secretary of Defense. At the time, DOD regulations allowed the Air Force to give orientation flights to any of the forces friendly to the United States. These flights were not given for the purpose of promoting the F-16, but merely for informational purposes only. In addition, the Air Force did not discuss price and availability information on the F-16 with Venezuela. The discussion in February 1981 between General Blanton of the U.S. Air Force and officials of the FAV concerned the sale of the Bell model 212 helicopters and the Gulfstream aircraft for the presidential support fleet. There was no discussion on anything dealing with the F-16 (46:13).

Secretary Buckley commented on the second issue concerning a possible proliferation of requests for the F-16 from foreign governments as a result of the sale to Venezuela. He felt that there would not be an avalanche of interest in the F-16 from other countries and mentioned that directives had been issued emphasizing the fact that no information was to be made available on the F-16 nor test

flights offered, in an attempt to keep other countries from developing an appetite for the F-16. However, should requests be received, it is DOD policy to carefully screen these requests, country by country and situation by situation. Obviously, no request would be considered if it was not in the best interests of the United States (46:6).

The third question concerned the future of the export fighter program. Secretary Buckley felt that the pending F-16 sale to Venezuela would in no way diminish the demand for the FX aircraft. At the present time the DOD has provided over 40 countries with information on the export fighter. Also, there is the cost factor between the FX and a more advanced aircraft. Countries are increasingly sensitive to the interest and cost burden of a significant arms sale. In the case of the F-5G, they can buy a very competent and capable aircraft for significantly fewer dollars than a more advanced one (46:8).

The final issue concerned the effect of the F-16 sale on the Latin American region. Secretary Buckley stated that the Arms Control Agency felt that the sale would not have a destabilizing effect on the region. Venezuela historically has not resorted to armed force in order to settle its disputes with its neighbors. Venezuela also enjoys significant air superiority over its border countries even without the F-16. Venezuela is not likely to stimulate an arms race. On the contrary, the sale is helpful in reinforcing Venezuela's role in stabilizing the Caribbean

region. The primary interest of Venezuela in the purchase of the F-16 is one of modernization of its air force, not an increase in its size (46:10).

Senator Percy then concluded the hearing stating that he had no indication that the sale would not be approved since there had been no resolution of disapproval entered by any member of the Senate (46:39).

Letter of Offer and Acceptance

The Letter of Offer and Acceptance was signed and accepted on 24 May 1982 and implemented on 23 July 1982 (43:1). The LOA outlined all provisions and responsibilities of the sale and was the contractual agreement between the United States and Venezuela. Major provisions included in the LOA were as follows:

Cost. The total costs of the Peace Delta Program were broken down into 29 different categories totalling \$615,252,380 million (Table V) (47:1-10).

Financial Arrangements. This agreement under section 21 of the United States Arms Export Control Act was financed solely on a cash basis. Quarterly billings for amounts due under this agreement were forwarded by the Security Assistance Accounting Center (SAAC) and payments (in U.S. dollars) were forwarded to that organization by check or wire transfer in time to meet prescribed due dates (Table VI) (47:8).

An initial deposit of \$95,700,000 accompanied and was

Table V
Peace Delta Program Costs

Category	Amount
18 F-16As	\$236,862,000
6 F-16Bs	81,666,000
Developmental Support Equipment	42,567,000
Standard Support Equipment	3,710,000
Weapon System Spares	23,477,000
F100-PW-200 Spare Engines	38,679,000
Training Equipment (Flight Simulator)	39,092,000
Aircraft Ferry Services	306,000
Site Activation Management	407,000
F-16 Standard Technical Publications	17,800,000
Aircraft Structural Integrity Program	3,325,000
Aircraft/Engine Modification Kits	3,036,000
Depot Overhaul Services	4,134,000
Contractor Technical Services	7,810,000
CIS Management Planning	4,430,000
CIS Support Equipment	6,856,000
CIS Airframe Spares	10,948,000
CIS Aircraft Maintenance	28,661,000
CIS Engine Spares	8,066,000
CIS Engine Maintenance	2,890,000
Contract Administration Services	1,497,000
Training Equipment Spares	11,522,000
AFSC Case Management	4,944,000
AFLC Case Management	2,978,000
HQ USAF Case Management	398,000
Training To Support Initial Activation ...	7,828,000
Packing, crating and handling	2,735,600
Administrative and service	17,816,670
Other costs	811,110
Totals	<u>\$615,252,380</u>

an integral part of the purchaser's acceptance of this LOA.

Transportation. The United States Government (USG) provided transportation services. Purchaser's property was transported at purchaser's risk. The USG provided movement

Table VI
Peace Delta Payment Schedule

Payment Date	Amount
Initial deposit	\$95,700,000
15 June 1982	43,500,000
15 September 1982	66,300,000
15 December 1982	74,000,000
15 March 1983	56,800,000
15 June 1983	52,100,000
15 September 1983	40,700,000
15 December 1983	34,600,000
15 March 1984	30,100,000
15 June 1984	26,700,000
15 September 1984	23,000,000
15 December 1984	20,600,000
15 March 1985	18,900,000
15 June 1985	15,600,000
15 September 1985	10,600,000
15 December 1985	4,500,000
15 March 1986	800,000
15 June 1986	500,000
15 September 1986	200,000
15 December 1986	52,380

Total	\$615,252,380

of all aircraft to point of delivery specified on the DD Form 1513, Letter of Offer and Acceptance. The USG accepted title to the aircraft from the contractor, title remained with USG until arrival at point of delivery at which time title passed to the purchaser. The aircraft were in USG markings with the purchaser responsible for removing markings upon delivery (47:12).

Spares and Equipment Support. Pursuant to Government of Venezuela request (in order to accomplish this short lead

time program), the following "defense articles" were obtained for installation from the respective prime sources listed on a sole source basis (47:13).

Defense Articles

Prime Source

F-16 Airframe	General Dynamics
F-100 Engine	Pratt and Whitney
Fire Control Radar	Westinghouse
Inertial Navigation System	Singer
Main Landing Gear, Wheels, Brakes	Goodyear Aerospace
Canopy	Sierrocin/Goodyear
Instrument Landing System	Collins Radio
ACES II Ejection Seat	McDonnell Douglas

The Government of Venezuela recognized that extraordinary contracting actions had been and were required to facilitate the accelerated program delivery schedule. These actions included steps taken by General Dynamics to begin the acquisition of subsystems at their own risk in anticipation of this offer being executed (47:14).

General Dynamics provided for initial organizational and intermediate spares for 24 aircraft including spares for airframe, engine, armament, avionics, and support equipment. These initial spares were projected to provide support for approximately 24 months of sustained operation. Specific items to be provided were to be developed as a recommended spares listing using 15 flying hours per aircraft per month, support data and evaluation of organizational and intermediate spares provided by the contractors (47:14).

General Dynamics also provided for a total of 8.48 spare F100-PW-200 whole/module equivalent engines, shipping

Table VII
Peace Delta Delivery Schedule

Aircraft	Quantity	Month	Year
F-16A	3	November	1983
F-16B	3	November	1983
F-16A	1	April	1985
F-16B	1	April	1985
F-16A	1	May	1985
F-16B	1	May	1985
F-16A	1	June	1985
F-16B	1	June	1985
F-16A	2	July	1985
F-16A	2	August	1985
F-16A	2	September	1985
F-16A	2	October	1985
F-16A	2	November	1985
F-16A	2	December	1985

containers, shipping trailers, adapters, and engineering change orders (47:15).

Delivery Schedule. For planning purposes, there was a two year in-country delivery schedule for the F-16A/B (Table VII) (47:20).

Contractor Interim Support. The CIS program provided a contractor support program which furnished organizational and limited intermediate maintenance to support all aircraft until full USAF support could be provided. The following items were included in the CIS cost (47:17):

- 1) Training of CIS teams
- 2) Flightline Support Equipment
- 3) Spares to support first six aircraft
- 4) OJT for a limited number of FAV personnel

- 5) Technical Data
- 6) Engineering Technical Services
- 7) Aircraft maintenance to support 15 flying hours per aircraft per month

Aircrew and Maintenance Training. The aircrew and maintenance training case provided for the following training:

- 1) F-16 conversion training for 6 FAV pilots
- 2) Maintenance training for 100 personnel
- 3) Aircrew conversion training will be conducted at a USAF training base using USAF aircraft at purchaser's expense and risk, including risk of aircraft damage or loss

Changes to Basic Airframe. The following peculiar changes/additions were included within the Venezuelan baseline (47:21):

- 1) Drag chute
- 2) Collins VIR-108 navigation receiver
- 3) ALR-46(V)-6 Radar Warning Receiver

V. Maintenance and Training

Overview

Venezuelan Air Force and U.S. Air Force officials realized from the onset that the most difficult obstacle to overcome in the Peace Delta program would be the establishment of a maintenance and administrative workforce in sufficient quantity and quality to support a sophisticated weapon system such as the F-16. This problem would be further compounded due to the accelerated delivery schedule called for in the LOA.

The Peace Delta Program required that six of the aircraft be delivered during the term of President Herrera who had initially approved the request for the F-16s. This delivery date was set at November 1983 since President Herrera was to go out of office in December 1983. Since the U.S. Air Force was not able to support the program until 42 months after LOA signature, the General Dynamics Corporation, Fort Worth Division, had the management and support responsibility during the initial period (7:1).

The Maintenance and Training Plan

The method chosen to satisfy the desired work force objectives called for Venezuelan Air Force maintenance and support technicians to receive technical training in the United States. In addition, a small number of pilots would receive F-16 flight training, also in the United States.

After completion of their training, this group would then return to Venezuela to form the nucleus of the F-16 operations and support force at El Libertador Air Base. From the period January to November 1983, 71 FAV maintenance technicians were trained at General Dynamics Corporation, Fort Worth Division, on F-16 maintenance procedures and policies. In addition, six pilots were trained at Luke AFB, Arizona to fly the F-16. These 77 individuals then returned to El Libertador in November 1983 to coincide with delivery of the first six F-16s (7:2).

The second part of the Training and Maintenance Plan called for a 64-man Contractor Interim Support team from General Dynamics Corporation to reside in-country and provide on-the-job training (OJT) in maintenance and supply procedures to support personnel and flight training to FAV F-16 pilots. They arrived in November 1983 at El Libertador Air Base and were originally supposed to terminate operations by March 1985 (45:1). However, due to a shortfall in the numbers of FAV technicians sufficiently trained to maintain the F-16 aircraft, the CIS program was extended for the period 1 April 1985 to 31 March 1986 (48:1). The CIS program was then extended for the period 1 April 1986 to 31 March 1987, again due to a shortage of trained FAV technicians (49:1).

Contractor Interim Support Program and Manpower Requirements

The primary objective of the CIS program was to provide

structured OJT for organizational and intermediate level tasks, and management that was consistent with in-country capabilities. The secondary objective was to provide maintenance of the aircraft on an as requested basis from the Venezuelan Air Force and was to be consistent with the ultimate objective of the CIS program, that of FAV self-sufficiency for maintenance of the F-16 (50:3).

Manpower requirements for the Peace Delta, CIS program, were divided into two functional areas - direct support, and management and administration. Direct support tasks were those that directly contributed to the logistics and maintenance support of the F-16 aircraft. Management and administrative functions were those required to manage and support other personnel. CIS program personnel were organized to parallel the FAV maintenance structure in most technical skill areas. The General Dynamics technicians were concentrated in selected areas of maintenance, logistics, and engineering support to provide the FAV with those skills required to support the F-16 flying program (50:5).

One of the major considerations in developing personnel and training requirements was the new technology and complexity of the systems on the F-16. The F-16 and associated systems were of a higher technology than the other less sophisticated weapon systems possessed by the FAV. This advanced technology was in the form of self-test digital avionics systems, fly-by-wire flight controls,

heads-up displays and automatic variable cambers for low drag/minimum buffeting (44:98). Since FAV personnel had not been exposed to advanced systems such as those on the F-16, OJT of FAV personnel within the required specialties required an increased length of time. The period for OJT of FAV personnel was estimated to be 18 to 24 months (50:6). Insufficient training could result in damage to equipment being repaired or to equipment being used in the repair process.

Due to the limited number of contractor personnel available, cross-utilization was employed in technical training. Technicians who were dual qualified, were capable of performing training in their primary and secondary specialties (50:11).

General Dynamics-trained and FAV field training detachment (FTD)-trained students posed distinct workloads on the training effort. Each group required individualized attention to achieve two training goals: (1) to ensure prompt upgrade of the 71 previously trained FAV technicians to a fully qualified status and (2) to rapidly qualify FAV FTD-trained students in their respective specialties. In both cases the General Dynamics technicians provided highly personalized training tailored to the individual needs of each technician in order to increase the probability of successful training or upgrade within the allotted period (50:13).

General Dynamics training courses consisted of specific

blocks of technical subject matter required for the technical specialities involved. Classes were conducted eight hours per day with six hours dedicated to classroom training and the remaining two hours used for demonstrations, observation of on-going maintenance activities, and self-study (50:20).

Training associated with support of the following tasks were excluded from the CIS plan:

- Aircraft depot maintenance and/or depot repair of failed components (in Venezuela).
- Storage, build up, maintenance, loading, and downloading of munitions and missiles.
- Explosive ordnance disposal.
- Electronic countermeasures pod intermediate maintenance.
- Personal equipment.
- Maintenance of general purpose vehicles.
- Maintenance of base electrical generation and facility air conditioning equipment.
- Ground communications.
- Facility maintenance.
- Transient alert.

General Dynamics technicians were provided cultural training in an effort to improve communication and understanding with the Venezuelan students. Emphasis was placed on the differences in history, religion, culture, economics, and government and politics (50:14).

Problem Areas

Numerous problems have been encountered in the area of training due to the accelerated delivery in Peace Delta. This in turn has had a negative effect on the maintenance and flying programs.

Language Barriers. Perhaps the major stumbling block in the training program is the capability of FAV students to speak English. The number of students who can speak limited English is decreasing rapidly, as evidenced by English Competency Level (ECL) scores continuing to drop. Non-use of the English language in the aircraft forms (AFTO Form 781A/K), conversations, and other areas has contributed to the sharp decrease in ECL scores. In cases where engineering change proposals and time change technical orders have altered technical data, tasks which had previously been taught to students, may not now be accomplished due to an inability to comprehend instructions (51:5). A few of the areas which have been affected by this problem are as follows (51:6-8):

- Supply - English language ability possessed by few FAV technicians in this area.
- Technical Order Documentation Office (TODO) - Tech order library personnel do not speak English although all T.O.s are in English.
- Group 16 APG Personnel (crewchiefs) - Almost one quarter of the assigned FAV personnel speak very little English.
- Data Automation - Of the six personnel assigned, one speaks no English, and the English levels of three others are considered poor to fair.

Assigned Manning. Another major area of concern involves the discrepancies between authorized and assigned personnel. At the current time, the FAV has 403 personnel authorized to support 24 F-16 aircraft however, they currently have only 235 personnel assigned (Table VIII) (52:3-4). Some of the same areas affected by the language problem are also adversely affected by this problem as well:

- Supply - Not adequately manned by the FAV.
- Technical Order Documentation Office - An adequate depth of personnel have not been assigned to T.O. functions.
- Maintenance Control - Inadequate manning assigned by the FAV. Trainees are being trained in two areas to make up for the shortage of personnel.
- Group 16 APG personnel (crewchiefs) - Inadequate numbers of FAV personnel assigned.

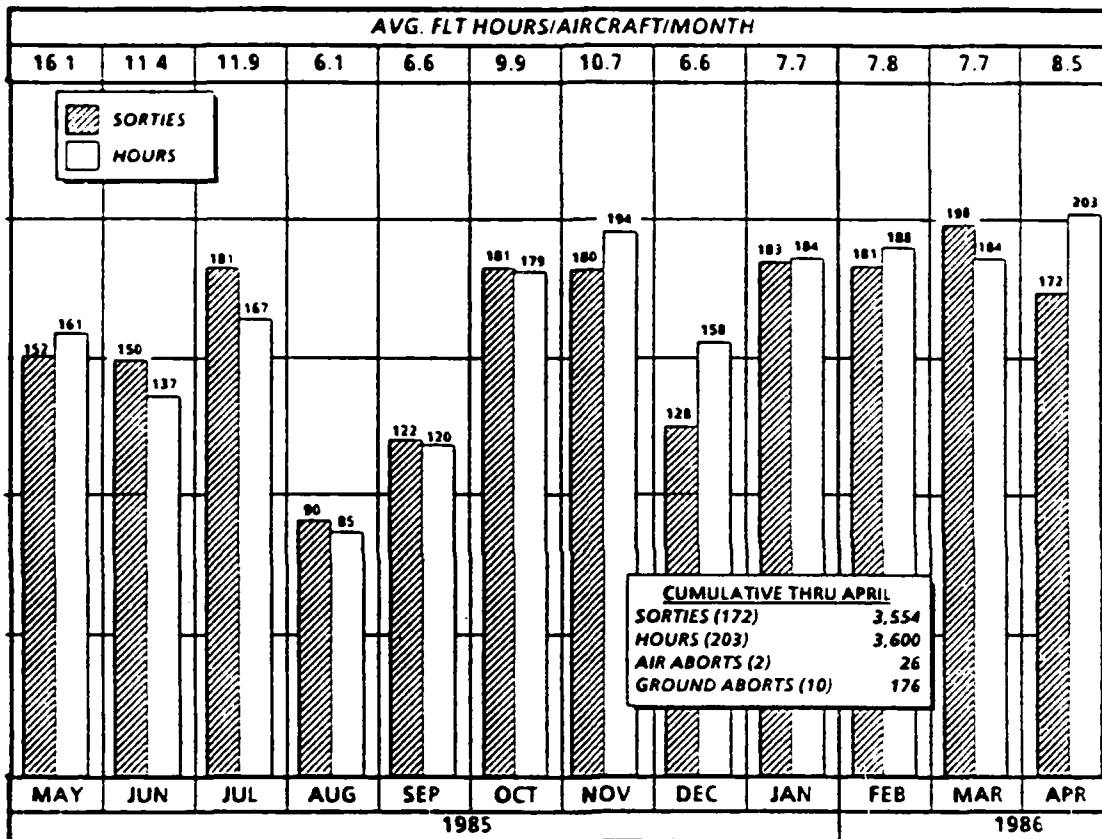
Pilot Proficiency. Pilot training has gone well from the initial six trained at Luke AFB to 26 currently qualified and several more in training. The problem in this area is that the present pilots are not flying enough hours to stay current (7:3). For 26 pilots, the FAV should be flying their F-16s a minimum of 260 hours per month and should average a minimum of 10 hours per pilot per month (53). During the one-year period May 1985 to April 1986, the FAV averaged only 163.3 flight hours per month, a total of 6.28 hours per pilot per month (Table IX) (45:5). Further compounding the problem, the ability to increase sorties and flying hours per month relies on the support of

Table VIII

Peace Delta Manning Authorizations

Section	Authorized	Assigned
Aerospace Ground Equip	20	11
Maintenance Control	11	3
Quality Assurance	12	8
Tech Order Documentation	12	1
Maintenance Supply Liaison	17	8
Engine Shop	14	15
Engine Quality Assurance	2	1
Engine Library	2	2
Materiel Management	11	14
Management and Procedures	4	0
Customer Support	13	6
Computer Operations	38	3
Computer Programming	5	6
PMEL	18	15
Pneudraulics	4	3
Avionics Intermediate Shop	10	8
Personal Equipment	6	2
Communications/Navigation	9	7
Attack Avionics	10	9
Environmental Control Systems	6	5
Airframe Repair	6	6
Nondestructive Inspection	2	2
Weapons Release	53	11
Egress	6	4
Flight Controls/Instruments	10	14
Pneudraulics (CM)	5	6
Engines (OM)	8	12
Fuels	10	4
Crew Chiefs	47	27
Electronics (OM)	9	8
Engine Test Stand	4	5
Storage and Distribution	19	9
Totals	403	235

Table IX
Peace Delta Flying Activity



an already undermanned and relatively unqualified maintenance force. The solution to this problem will not occur rapidly; more time is needed to increase manning levels and adequately train the workforce.

At the final outbrief of the Security Assistance Management Review which was conducted at El Libertador during the week of 10 March 1986, General Robert Delligatti, HQ USAF/PRIA, emphasized the danger and potential aircraft attrition which will come with undertrained and understaffed maintenance operations (54:1).

VI. Logistics Support

Overview

Without initial and follow-on logistics support a newly purchased weapon system rapidly takes on the traits of a prized museum piece -- impressive to look at, but immobile and impotent. The Republic of Venezuela recognized the need to acquire a viable logistics support program for their F-16 aircraft. Over \$100 million was committed for initial and follow-on logistics support in the Peace Delta program (47:10).

Automated Logistics Management System

Under the Peace Delta program, FAV logistics tasks were facilitated through the installation of an automated logistics management system (ALMS). The ALMS consisted of an IBM 4331 supply computer, which has since been upgraded to the IBM 4361 computer. This system provided the FAV with a serialized parts and events tracking system (44:180). At the present time, over 100,000 line items are loaded into the system. This includes not only line items for the F-16, but also items for the OV-10, UH-1H, and C-130 weapon systems and the Boeing 737 presidential support aircraft (52:8). The ALMS system directly interfaces with the USAF International Logistics Center at Wright-Patterson AFB, Ohio and will eventually tie in with Venezuela's freight forwarder located in Miami, Florida (7:2).

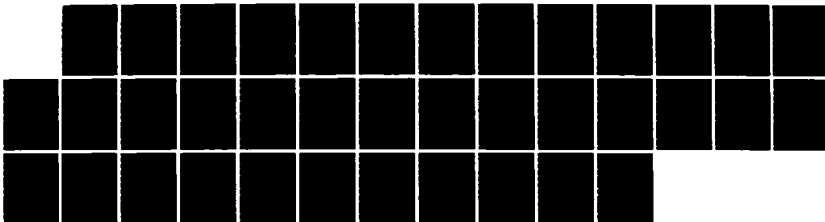
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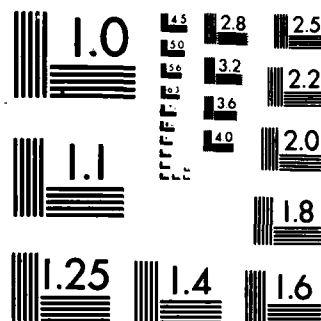
EMPLOYMENT PROBLEMS ASSOCIATED WITH THE ACCELERATED
DELIVERY OF THE F-16 T. (U) AIR FORCE INST OF TECH
WRIGHT-PATTERSON AFB OH SCHOOL OF SYST. M N DAVIS
SEP 86 AFIT/GLM/LSP-86S-13 F/G 15/5

2/2

UNCLASSIFIED

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MICROCOPY RESOLUTION TEST CHART
NATIONAL BUREAU OF STANDARDS-1963-A

To accomodate the logistics requirements, four individuals under the CIS program, skilled in the supply disciplines of computer programmer/operator, inventory management specialist, and material storage and reparable processing specialist were determined to be necessary to train FAV personnel and implement the ALMS system (50:5).

A logistics data systems specialist operated, and trained the FAV personnel in the operation of, the automated data processing equipment including system administrative functions, system operations, testing, debugging of application programs, and processing of end-of-day management reports (50:14).

Three logistics specialists trained and assisted FAV personnel in receipt, storage, issue, repair, tracking, asset accountability and material replacement planning of mission support spares. They also assisted FAV personnel in directing the shipment of cargo, both general and hazardous, by air, to sustain equipment in-commission rates for tactical aircraft and support equipment (50:14).

Follow-on Spares and Support Equipment

At the time the Peace Delta LOA was signed in 1982, there existed a severe shortage of support equipment and spares for the F-16 aircraft. However, General Dynamics was able to devise a procedure, called an early delivery plan, which would enable these assets to be available during the accelerated aircraft deliveries in November 1983. The early

Table X
Peace Delta Spares Shipments

Fiscal Year	Shipments	Deliveries	Delinquent
1983	36,243	36,243	0
1984	248,890	248,822	68
1985	333,804	333,758	46
1986	224,693	224,673	20

delivery plan called for General Dynamics to purchase from the individual contractors the long lead items, (those that are longer than 24 months), at their own risk. As these items were received, they were put in storage in anticipation of the expected Peace Delta sale. The success of the early delivery plan is reflected in the low numbers of delinquent spares shipments to Venezuela since FY 1983 (Table X). Had the sale been cancelled for any reason, General Dynamics would have had millions of dollars in F-16 spares and equipment for which they had no buyer (53).

The Peace Delta LOA called for all FMS materiel to be shipped direct from General Dynamics to Venezuela (56:1). The majority of CIS materiel was aggregated at General Dynamics for movement by the FAV. The transportation plan presented during the 15-25 March 1983 Deployment Status Review/Program Management Review, projected total weight and volume of Peace Delta assets available for movement to

Venezuela from July through December 1983. In addition to CIS assets, Pratt & Whitney engine items and regular FMS assets from the Miami freight forwarder were also included. The six month transportation plan required 34 C-130 pilot-pickup missions by the FAV (57:1).

Cooperative Logistics Supply Support Arrangement. One of the major follow-on support considerations by the FAV was a decision to participate in the Cooperative Logistics Supply Support Arrangement (CLSSA) concept (58:1).

The Department of Defense considers CLSSAs to be one of the most effective means to replenish stocks of spares and repair parts initially furnished with weapon systems sold through FMS (59:2).

The CLSSA is an agreement for the furnishing of secondary items from the DOD logistics system to a foreign government in support of major weapon systems. The arrangement requires a foreign government to make an initial investment in the DOD logistics system to establish an equity which represents anticipated support requirements (2:19-4). This initial dollar investment enables the DOD to purchase additional spares in anticipation of these requirements. The quality of support provided under CLSSA to a foreign government will be the same as that provided to similar U.S. forces within assigned Force Activity Designators (59:4).

The effectiveness of a CLSSA is influenced by a number

of factors. CLSSA effectiveness is based on the premise that there are already adequate inventories of spares available in the purchasing country. This requirement is accomplished through the initial support package provided during the initial sale of the weapon system (2:19-6). The participating country should submit replenishment requisitions in a routine manner and avoid ordering large quantities at infrequent intervals. This will ensure timely replenishment of in-country stocks (59:4). In addition, CLSSAs are not intended for augmentation of in-country stocks due to a change in mission or by an increase in end items. These requirements should be satisfied through a Defined Order or Blanket Order case (2:19-6).

A team of AFLC personnel visited Venezuela 14-18 March 1984 for the purpose of assisting the FAV in definitizing USAF recommendations for F-16 support through the CLSSA. The FAV returned the definitized listings to the International Logistics Center on 17 August 1984 after a thorough review by its technicians (58:1).

Problem Areas

The acceleration of the Peace Delta program has resulted in a number of logistics support problems for the F-16.

Training and Manning Levels. Lack of properly trained logistics personnel and shortfalls in assigned manning have had negative impacts on aircraft support.

At the present time, the supply function is not adequately manned by the FAV. In addition, few people assigned in this area have an adequate English language capability. In the data automation area, computer programmers are not meeting established training schedules. Numerous personnel are slowing the progress of other students as a result of inadequate preparatory training (52:7). The areas of Demand Processing, Stock Control, Research, and Files Maintenance are all severely undermanned. Also, additional warehouse personnel are desperately needed (55:2).

Over 5,000 due-in details are loaded in the 4361 supply computer that are in need of verification and necessary adjustments. At the present time, there are no individuals assigned to purge files. There are also no individuals assigned the responsibility to suspense/reply and disseminate messages received requesting additional information on supply requests, time compliance technical orders and replies to disposition instructions. It is extremely important that information requested/furnished be acted upon to ensure program success (60:1). There is a lack of coordination between the aircraft maintenance squadrons, stock control and the receiving and shipping section on reports of item discrepancies. This coordination is vital to ensure prompt return of defective items and the recovery of funds. Contractor interim support spares and follow-on support spares are commingled in the supply

warehouses resulting in accountability and inventory problems. Timely processing of receipts from vendors needs to be accomplished. In some cases, delays of over two months have occurred in processing receipts, impairing customer support and aircraft readiness (55:3).

Late to Need Equipment. A shortage of needed equipment and technical orders in the precision measurement equipment laboratory has led to a severe deficiency in training. Of the total items requisitioned from June 1983 to March 1985, 1,874 had been shipped, and 872 requisitions were still open, resulting in a fill rate of 68%. The status of items considered critical to the F-16 were 163 requisitioned, 89 shipped, and 74 requisitions still open, for a fill rate of 55% (61:43). Technicians are not receiving the required training in troubleshooting and calibration procedures and maintenance of the Stores Management System Test Stand. Assets from other activities on base are needed for operational purposes and are difficult to obtain for training (52:11).

Used or High Time Line Replacement Units. During some F-16 deliveries, FAV officials began to notice that some line replacement units (LRUs) on the aircraft had elapsed time indicators (ETIs) which demonstrated that they were not receiving new components. The FAV felt it would be difficult to explain to the Ministry of Finance why they paid for new parts and received used parts instead. The country was very sensitive to such issues as a result of the

court martials being held at that time for three former ministers of defense (62:1). This became a major issue which escalated all the way to the President of Venezuela, Jaime Lusinchi, and caused some embarrassment for the U.S. Air Force. Venezuelan law specifically prohibits them from accepting used equipment when purchased as new. This problem occurred because in order to meet the required production and delivery schedules, the Peace Delta LOA allowed for the installation of "serviceable" equipment if necessary. This meant that either new or used equipment could be utilized so long as they both carried the same warranty conditions. Analysis of 480 LRUs installed on 24 aircraft revealed (63:1):

<u>With More Than</u>	<u>Number of LRUs</u>
50 hrs	273
100 hrs	149
200 hrs	58
250 hrs	38
300 hrs	27
500 hrs	19

A compromise was reached whereby the USAF agreed to replace any LRU having more than 100 hours ETI at time of delivery. In turn, the FAV agreed to accept LRUs with slightly higher time if the extra hours could be traced to "burn-in" (testing), rather than having been installed on other aircraft (7:3). At the present time, this is still a sensitive subject.

VII. Infrastructure

Overview

The site survey for Peace Delta was conducted in Venezuela from 20-30 September 1981. Bases visited during the period were El Libertador, Mariscal Sucre, and Vicente Landaeta. The team consisted of representatives from HQ USAF, Air Forces Systems Command, Air Force Logistics Command, Tactical Air Command, Air Training Command, General Dynamics Corporation, Pratt and Whitney and Westinghouse Corporation (64:3).

The original basing concept called for moving the first six F-16s from El Libertador to Vicente Landaeta Air Base and activating the first F-16 squadron at that location when deliveries began. The survey team however, recommended that the first squadron be activated at El Libertador to provide continuity during the transition period between CIS and full FAV responsibility. The recommendations provided by the team concerning facilities requirements were based on this initial basing recommendation (64:3).

The FAV needed to make timely decisions concerning F-16 dedicated hangars and ancillary shops at El Libertador Air Base to allow the civil engineer time to respond prior to facility need dates. At El Libertador AB, the Mirage maintenance hangar was recommended for F-16 usage. Other new and modified construction projects recommended in the site survey required a concerted FAV effort toward project

validation, programming, design and construction to support maintenance and equipment needs and allow long-lead construction projects time to meet beddown needs (64:3).

The findings of the site survey team are categorized into the areas of Operational Facilities, Aircraft Consumable Storage Facilities, Support Equipment Maintenance Facility, Specialized Maintenance Facilities, Logistics Facilities, Avionics Intermediate Shop Facility, Precision Measurement Equipment Laboratory and Electrical Power Facilities.

Operational Facilities

Operational facilities are those facilities related to the aircraft runway, taxiways and other specialized airfield areas.

Runway, Taxiways, Aircraft Parking Apron, Warm-Up Pad.

The F-16 required a light-load paved runway, at least 9,000 feet long and 150 feet wide, and a paved overrun of 1,000 feet at each end of the runway in case of an aborted takeoff. A parking ramp for 20 aircraft of 36,000 square feet (30 feet wide by 1,200 feet long), parked in a single row in a 45 degree pattern was also required (64:1.4).

The El Libertador AB runway was found to be 3,000 meters long by 60 meters wide. The aircraft touchdown area was concrete and 18 inches in depth. The remainder of the runway was 18 inches of concrete with a top layer of 12 inches of asphalt. The runway, taxiways, parking apron, and

warm-up/holding pad were in satisfactory condition and well-suited for F-16 operations. There was adequate space to park 20 F-16 aircraft in front of the current Mirage hangar. A geodetic survey was required to permit setting departure coordinates into the F-16 navigation system. Lighting and navigational aids were suitable for all weather operations (TACAN, ILS, GCA, and VOR) (64:1.4).

Aircraft Arresting Barrier. The F-16 was equipped with an arresting tail hook system. An aircraft arresting cable barrier system such as the BAK-9, 12 or 13 with a BAK-14 cable support system was necessary for F-16 operations (64:1.5).

The survey team found that there was no aircraft arresting cable system at El Libertador AB. There was an existing barrier net system installed on the departure end of the runway which could be electrically controlled from the tower (64:2.4).

The team recommend installation of a BAK-9, 12 or 13 aircraft arresting system with a BAK-14 cable support system. The F-16 System Program Office was to provide BAK-14 data to the FAV civil engineer and evaluate the existing net system for the F-16.

Arm-Disarm Pad. An Arm-Disarm Pad was required for arming aircraft immediately before take-off and for disarming (safing) weapons retained upon aircraft return.

The arming pad was located at the west end of the runway and the disarm pad at the east end. The FAV used the

arming pad for the upload and preparation of explosives hazard class 1.1 munitions (MK-82's) (64:1.5). The existing arm-disarm pads met the FAV intended use and mission requirements for the F-16 aircraft (64:1.5).

Aircraft Consumable Storage Facilities

Aircraft consumable storage facilities are those facilities which store fuel and gaseous products required by the F-16 aircraft.

Jet Fuel Storage. Twenty F-16 aircraft at 15 flying hours per month using 6,000 pounds of jet fuel per flying hour required 1,800,000 pounds of fuel per month (64:1.6). The FAV indicated a use of 60,000 liters per day of jet A-1 fuel with de-icer added (acceptable IAW T.O. 1F-16A-1). The storage capacity of jet fuel at El Libertador AB was 500,000 liters. Oils, hydraulic fluid and other lubricants were also stored at the fuel storage facility.

The site survey team recommended that the FAV analyze their jet fuel storage requirements using F-16 consumption data, current use for other aircraft, and operational supply stockage requirements to determine a need for additional jet A-1 and de-icer storage (64:1.6).

Oxygen and Nitrogen Storage Facilities. The F-16 required liquid oxygen (LOX) for aircrew use and nitrogen for the aircraft landing gear. The storage area for bulk liquid nitrogen and liquid nitrogen tanks and servicing carts should be paved, fenced, and adjacent to the

flightline. A paved pad approximately 25 feet by 40 feet, surrounded by a chain link fence with a 12 foot wide double gate for delivery truck and cart access was required. The pad should be covered to provide shade and rain protection (64:1.6).

At El Libertador AB, LOX, gaseous oxygen and gaseous nitrogen were delivered to the base under contract from local vendors. The FAV did not use or store liquid nitrogen. Liquid nitrogen was used in F-16 operations for storage convenience. The liquid nitrogen would be converted to gaseous nitrogen upon delivery to the aircraft. The present LOX pad was located adjacent to the flightline fire station. It was 25 feet by 25 feet in size with a gated chain link fence and roof. Two LOX bulk storage tanks, 500 gallon capacity each, were located there along with two servicing trailers (64:1.6).

The site survey team found that gaseous oxygen and nitrogen storage was adequate. They suggested that the LOX storage capacity be evaluated by the FAV based on their operational concept and minimum stock level availability. If liquid nitrogen storage was desired, the existing LOX pad, fence, and roof should be expanded 15 feet to the east to provide space for bulk liquid nitrogen tanks and servicing trailers (64:1.6).

Support Equipment Maintenance Facility

The support equipment maintenance facility would

repair, modify, inspect, and service powered and non-powered support equipment, including munitions support equipment.

Requirements for the shop included: (1) ceiling heights of 15 feet in maintenance areas and 9 feet in all other areas, (2) electrical power of 120 VAC, 1 phase, 60 hertz; 230 VAC, 3 phase, 60 hertz; 277/480 VAC, 3 phase, 60 hertz; and 120/208 VAC, 3 phase, 60 hertz, (3) compressed air, 80-125 pounds per square inch at 14.5 cubic feet per minute, (4) cold water, 20 gallons per minute at 40 pounds per square inch, (5) light load concrete floor with petroleum resistant surface, and (6) Work stalls, storage and machine shop, a lubrication lift or pit, offices, tool issue room and utility rooms (64:1.9).

The team found that there was no facility dedicated for support equipment maintenance. A new support equipment maintenance shop was required. They recommended that the shop be located adjacent to the west side of the Mirage maintenance hangar (64:1.9).

Specialized Maintenance Facilities

The F-16 maintenance plan called for specialized maintenance activities to be housed in a general purpose aircraft maintenance shop facility. The shops listed below were to be included in this facility:

- Battery Shop
- Electrical Shop
- Egress Shop

- Personal Equipment Shop
- Wheel and Tire Shop
- Quality Assurance, T.O. and Reference Library
- Weapons Release Shop
- Gun and Ammunition Loading System Shop
- Tool Issue Center
- Training Classrooms
- Offices
- Drag Chute Shop

The survey team suggested that the Mirage hanger be modified and dedicated to F-16 maintenance. The available shop facilities located within the hangar were found to be acceptable for F-16 maintenance operations with a few additions/modifications needed 64:1.14).

Battery Shop. A deluge shower, sink, floor drain, exhaust fan, and eye wash fountain needed to be added (64:1.24).

Electrical shop. The current electrical shop was adequate with no modifications required (64:1.34).

Egress Shop. Explosive storage, jib crane (for canopy removal), storage shelving, T.O storage, work tables, and compressed air needed to be added to the current facility (64:1.30).

Personal Equipment Shop. Storage cabinets and additional shelving needed to be added (64:1.24).

Wheel and Tire Shop. No modifications were required to

the current facility (64:1.25).

Quality Assurance and T.O. Library. Additional shelving was required for storage of F-16 T.O.s (64:1.20).

Weapons Release Shop. The present weapons release shop located in the Mirage hanger was adequate in terms of size and utilities except that there was no forced air exhaust system, grounding points, or a sufficient number of work benches (64:1.19).

Tool Issue Center. The current facility was acceptable for F-16 operations (64:1.22).

Training Facilities. Items such as desks, chairs, filing cabinets, tables, bookcases and a television and Video Cassette Recorder and blackboards were needed (64:1.34).

Offices. Tables, bookcases, desks and chairs were needed for office areas (64:1.34).

Drag Chute Shop. Racks for asset storage, new packing table and pressure packing equipment were required (64:1.34).

Logistics Facilities

The programmed F-16 spares quantities were found to tax the current FAV warehouse capacity and would require a concentrated management effort to ensure adequate warehousing was available prior to initial spares lay-in (64:IV).

There was found to be insufficient warehouse space

available for F-16 material in the main depot warehouses. Current FAV spares were scattered in various storage areas. The team recommend that F-16 spares be stored in one building (64:1.92). Several existing buildings were evaluated by the team.

Building 10. This facility provided storage for C-130, OV-10, Cessna, C-123, B-737, CF-5 and Queen Air aircraft components. The effort required to make additional space available for F-16 component storage would not have been cost effective (64:9.2).

Building 11. This structure was being used to store Mirage, Canberra, Alouette, and UH-1 aircraft parts. The cost and work of adding additional storage space would have been excessive (64:9.2).

Building 32. This structure was being used as a shipping/receiving area, storage for reparable shipments and storage for items awaiting warehouse storage. It was recommended that building 32 be converted to an F-16 spare parts warehouse, or that a new warehouse similar to the existing facility be built. If building 32 was used, certain modifications would be necessary. Construction of a loading dock to accomodate a forklift to on/off load large items from trucks would be required. Also, two refrigerators in which to store F-16 epoxies and glues which require a temperature of 50 degrees or less would be needed (64:9.3).

Avionics Intermediate Shop Facility

The FAV desired avionics self-sufficiency at the depot level. The existing equipment in the FAV electronic center facility, developed by Westinghouse, had a very good capability in the areas of communications, navigational aids equipment, instruments and general purpose analog testing. To use the existing Westinghouse test stations in the electronics facility at El Libertador, it would be necessary to have Westinghouse develop required adaptations and testing procedures documents for some LRUs. Air conditioning and electrical power capabilities in the electronic center were considered adequate to meet the stated requirements for the avionics intermediate shop (AIS). However, concerns were raised on the dependability and quality of current electrical power. The team recommended that the AIS have a dedicated power source. (64:8.4).

Precision Measurement Equipment Laboratory

The current PMEL building required a modification of the air conditioning, humidity control and dust control systems. In addition, an extension of the building was recommended in order to store PMEL repair parts in the building. a dedicated power source was also recommended (65:5).

Electrical Power Facilities

Power in Venezuela was 60 cycle and compatible with

USAF equipment. The FAV advised that a new power plant of 60,000 KVA capability was scheduled for completion in mid 1983. The amount of this power which was identified to be dedicated to El Libertador varied from 2,000 KVA to 30,000 KVA. The additive power requirements created by the F-16 introduction at El Libertador was difficult to quantify. The new power generating plant and dedicated power lines to El Libertador would solve the present problem of power outages, brown-outs, and voltage/frequency fluctuations (64:1.69).

Problem Areas

For the most part, the facilities at El Libertador AB were more than satisfactory for conversion to F-16 flight operations. The majority of facilities which supported the Mirage aircraft maintenance effort required only minor modifications for the F-16 maintenance program. There are however, four facility areas which are having a definite negative impact on the Peace Delta maintenance and logistics effort. The current state of power generation facilities, the Avionics Intermediate Shop facility, the Precision Measurement Equipment Laboratory facility and the Logistics Facilities.

Power Generation Facilities. At the present time, the majority of facilities at El Libertador AB are reliant on commercial sources for their electrical power requirements. Unfortunately, these are not always reliable sources. The

facilities at El Libertador AB are frequently subjected to power surges, cycle fluctuations, brown-outs and power failures. A contributing factor to this problem is the numerous instances of "power theft" that occurs in the city and outlying areas of Maracay. The numerous neighborhoods that spring up in and around the city tap into the existing power lines for electricity. Instances of 300 houses or more served off of one line are sometimes found. At present, the authorities have been hesitant to enter these areas to police the situation for fear of safety (66). The power facility which was scheduled for completion in 1983 is not quite finished yet. In addition, the suggested uninterrupted power supplies (UPS) and power generators for the AIS and PMEL lab have not been completed yet.

Avionics Intermediate Shop Facility. Venezuelan officials have expressed their serious concern on the failure of the AIS to achieve operational status. Current status of the AIS is as follows (67:1):

--Computer Inertial Test Station	54% Operational
--Processor Pneumatic Test Station	100% Operational
--Display Indicator Test Station	100% Operational
--Radio Frequency Test Station	67% Operational

The failure of the AIS to Achieve operational status is caused by several factors.

The humidity in the AIS building currently cannot be maintained within the limits required by AIS specifications.

A check of the environmental control system showed the system exceeded maximum tolerances by 5% (67:2).

Repeated power outages, brownouts, voltage spiking, and frequency fluctuations have caused "burn out" failure of AIS components. Of the 49 items returned for repair, 30 showed burn-out on the power input side which indicated an over-voltage condition (67:1). Due to the high failure rate of the AIS components, training is not being accomplished because test stations have not been fully operational. In addition, lack of sufficient spares has also aggravated the problem. Full operational capability will not be achieved until the power problem is corrected. The use of an uninterrupted power source and 125 KVA generator combination to operate the AIS has been suggested. The estimated cost of the system is approximately \$90,000 with an additional cost for construction of a facility to house the UPS/generator unit and to re-wire the facility (62:1).

Precision Measurement Equipment Laboratory. The PMEL facility has several discrepancies which limit its effectiveness.

Temperature and humidity recorder data do not meet the PMEL specification requirements of AFM-88-4 and T.O. 00-20-14. The temperature is running from 64 degrees F to 66 degrees F causing high humidity readings of 60% relative humidity (68:55).

A dust problem exists in PMEL due to several unresolved conditions. Improper air conditioning, lack of rubber seals

on outer and inner doors, and very loose traffic control have contributed to this problem (68:71).

No provision exists for back-up emergency power in the PMEL lab in case of power failure. Certain primary reference standards must have a constant power supply to maintain stability (68:57). In addition, numerous component failures can be attributed to voltage spiking and frequency fluctuations.

Logistics Facilities. There are a number of shortfalls in the quality and capabilities of logistics facilities which affect aircraft support.

Due to a limitation on available warehouse space, CIS spares and FMS spares have been commingled which will cause an accountability and inventory problem when it is time to turn all assets over to the FAV (60:2).

Lighting is totally unsatisfactory in all warehouses. This condition has undoubtedly caused continuous inventory accuracy problems, and is an unhealthy environment for anyone to work in (55:2).

Lack of a back-up power source for the ALMS during power outages has negatively impacted supply support. The ALMS is totally ineffective during the frequent power interruptions/fluctuations that plague El Libertador AB.

VIII. Summary and Conclusions

Overview

The purpose of this thesis was to identify the employment problems in the Peace Delta program associated with the accelerated delivery of the F-16 aircraft. In support of this objective, three research questions were posed in Chapter one and answered in subsequent chapters. These questions, along with their respective research results, are summarized in the first portion of this chapter.

In addition to the formal research summary, several additional conclusions/recommendations are presented in the last portion of this chapter. These conclusions represent the personal observations of the author. Finally, some suggestions for further research are proposed.

Research Questions and Associated Results

The three research questions formulated in chapter one are presented, along with their respective research results.

Question 1. What effect has accelerated delivery had on the training of support personnel, and the maintenance and flying programs?

It is obvious that the most pressing issue facing the Peace Delta program today is the lack of sufficiently trained FAV support personnel. This situation is illustrated by the fact that the General Dynamics

Corporation's Contractor Interim Support team has been extended twice past their initial phase out date of March 1985. At the present time, the FAV is not able to support the Peace Delta program nor are they likely to in the near future without increased manning and an increase in trained support personnel. Had the Peace Delta program followed the Air Force's suggested standard of commencing aircraft deliveries 42 months after LOA signature, the FAV could have been afforded the required time needed to project their manpower requirements, recruit the required numbers, and train sufficient personnel to assume the support role for the F-16 in a minimum amount of time.

The maintenance program for the F-16 at El Libertador AB has gone well since delivery of the first six aircraft in November 1983. In-commission rates have generally averaged around 90% (53). The success however, is more the result of the expertise and dedication on the part of the individuals from General Dynamics who make up the CIS team and less as the result of the FAV maintenance efforts. Although initially the CIS team's primary role was supposed to have been one of training, it has actually been weighted heavily toward maintaining the F-16 with less of an emphasis on training FAV maintenance personnel.

Similarly, the flying program has also been successful. However, the problem in this area is the lack of sufficient flying time for each pilot. The Venezuelan pilots need to be flying their F-16s at least 10 hours per man, per month

to remain proficient. The primary reason for this low utilization rate is a lack of a sufficiently large support force to generate more sorties and more flying hours per month.

Question 2. What effect has accelerated delivery had on logistics support?

The primary effect accelerated delivery has had on logistics support has been in a shortfall of sufficiently qualified personnel to operate the Automated Logistics Management System. The entire supply area is not adequately manned by the FAV. In addition, computer programmers and operators are not meeting established training schedules. This problem relates back to the overall lack of sufficiently trained support personnel addressed in research question 1.

Accelerated delivery has not had a pronounced effect on the availability of spares and support equipment for Peace Delta. The primary reason spares availability was not affected by accelerated delivery resulted from the extraordinary effort General Dynamics undertook to purchase the long lead items at their own risk. The area concerning LRU spares (high time/used LRUs), although not a problem of availability, nevertheless caused the U.S. Air Force some embarrassment. To meet the required production and delivery schedules for the accelerated program, the Air Force could not selectively install brand new LRUs in the F-16s destined for Venezuela. Although Air Force officials explained to

the FAV that "used" LRUs are, for the most part, more reliable than new components, Venezuelan law is quite clear on its prohibition of acquiring used equipment when purchased as new. At the present time the Air Force is attempting to replace all LRUs whose ETI registered 100 hours or more at time of delivery. However, in some cases, brand new LRUs have current lead times from the manufacturers of three years or more (63:2).

Non-availability of support equipment has only seriously affected one area, the Precision Measurement Equipment Laboratory. Numerous support equipment shortages have prevented the proper training of FAV PMEL personnel, aggravating an already serious situation of training deficiencies in the Peace Delta program.

Question 3. What effect has accelerated delivery had on the infrastructure that was designed to support the entire program?

Existing facilities at El Libertador AB were, for the most part, adequate for F-16 operations. Minor modifications and additions were required for a number of the maintenance shops. The most serious problem affecting the Peace Delta program in this area is the current state of electrical power.

Presently, key support facilities such as the Precision Measurement Equipment Laboratory, the Avionics Intermediate Shop, and computer facilities for the Automated Logistics Management System, do not have dedicated power sources for

use. They must therefore depend on unreliable commercial sources. Frequent power failures, brown-outs, and fluctuations, have limited the use of these key facilities. In addition, voltage spiking and cycle fluctuations have caused burn outs and failure of many critical aircraft components. As a result, the AIS has exhausted its stock of serviceable spares and caused the FAV to accuse the Air Force and General Dynamics of selling them faulty equipment. A combination of uninterrupted power sources/power generators for these facilities have been proposed but have not yet been completed. The delays were caused by the long-time FAV insistence that there was no power problem at El Libertador AB.

Conclusions and Recommendations

Overall, the Peace Delta program has been very successful. Fully mission capable rates, maintenance and safety records have been excellent. The primary reason behind this success was the commitment on the part of General Dynamics Corp. to make the program a success. They risked millions of dollars of their own money to purchase the long lead items from contractors to ensure their availability when the first six F-16s landed at El Libertador AB. The individuals who made up the CIS team and maintained the aircraft were highly trained and dedicated individuals.

The FAV currently suffers from an undermanned and relatively untrained support staff which adversely affects

the maintenance and logistics areas. In addition, the maintenance and logistics efforts are also being hampered by the undependable commercial power at El Libertador AB and a small number of insufficient facilities.

Had the Peace Delta program been given a 42 month leadtime until aircraft deliveries, many of these problems might have been avoided. The desire on the part of the State Department to maintain cordial relations with our foreign allies is important, but should not outweigh the judgement of experts. In the case of Peace Delta, there was no logical need to have the first six aircraft delivered within 18 months after LOA signature. By introducing a sophisticated weapon system before the proper groundwork is laid, problems are created for both the contractor, the United States Air Force, and the foreign government involved.

Recommendation for Further Research

A potential area for further research pertaining to accelerated deliveries of F-16 weapon systems is the case of the F-16 sale to Egypt, Peace Vector. Peace Vector, similar to Peace Delta, also involved an accelerated delivery program to a foreign government. The sale of the F-16 to the government of Pakistan was also an accelerated program however, the initial aircraft deliveries were done without full logistical support to avoid possible significant adverse impacts on U.S. capabilities. Other weapon systems,

such as the Northrop F-5, have also been involved in FMS accelerated deliveries and provide another potential area for further research.

A valuable compendium of lessons learned could ultimately be established from such a series of studies on sales that involve accelerated aircraft deliveries.

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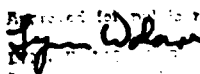
Permanent address: Route 1, Box 8

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UNCLASSIFIED

SECURITY CLASSIFICATION OF THIS PAGE

REPORT DOCUMENTATION PAGE

1a. REPORT SECURITY CLASSIFICATION UNCLASSIFIED		1b. RESTRICTIVE MARKINGS	
2a. SECURITY CLASSIFICATION AUTHORITY		3. DISTRIBUTION/AVAILABILITY OF REPORT Approved for public release; distribution unlimited.	
2b. DECLASSIFICATION/DOWNGRADING SCHEDULE			
4. PERFORMING ORGANIZATION REPORT NUMBER(S) AFIT/GLM/LSP/86S-13		5. MONITORING ORGANIZATION REPORT NUMBER(S)	
6a. NAME OF PERFORMING ORGANIZATION School of Systems and Logistics	6b. OFFICE SYMBOL (If applicable) AFIT/LSP	7a. NAME OF MONITORING ORGANIZATION	
6c. ADDRESS (City, State and ZIP Code) Air Force Institute of Technology Wright-Patterson AFB, OH 45433-6583		7b. ADDRESS (City, State and ZIP Code)	
8a. NAME OF FUNDING/SPONSORING ORGANIZATION	8b. OFFICE SYMBOL (If applicable)	9. PROCUREMENT INSTRUMENT IDENTIFICATION NUMBER	
8c. ADDRESS (City, State and ZIP Code)		10. SOURCE OF FUNDING NOS.	
		PROGRAM ELEMENT NO	PROJECT NO.
		TASK NO.	WORK UNIT NO.
11. TITLE (Include Security Classification) See Box 19			
12. PERSONAL AUTHOR(S) Matthew N. Davis, B.A., Captain, USAF			
13a. TYPE OF REPORT MS Thesis	13b. TIME COVERED FROM _____ TO _____	14. DATE OF REPORT (Yr., Mo., Day) 1986 September	15. PAGE COUNT 130
16. SUPPLEMENTARY NOTATION			
17. COSATI CODES		18. SUBJECT TERMS (Continue on reverse if necessary and identify by block number)	
FIELD	GROUP	SUB GR	
01	03		
		Foreign Policy, Foreign Military Forces, Military Assistance, Venezuela	
19. ABSTRACT (Continue on reverse if necessary and identify by block number)			
Title: EMPLOYMENT PROBLEMS ASSOCIATED WITH THE ACCELERATED DELIVERY OF THE F-16 TO THE REPUBLIC OF VENEZUELA			
Thesis Chairman: Charles M. Farr, Major, USAF Assistant Professor of Contracting Management			
 Approved for release to the public: 1999 APR 159-17 292416 Information Systems and Development Air Force Research and Development Weapons and Armaments Center			
20. DISTRIBUTION/AVAILABILITY OF ABSTRACT UNCLASSIFIED/UNLIMITED ☒ SAME AS RPT ☐ DTIC USERS ☐		21. ABSTRACT SECURITY CLASSIFICATION UNCLASSIFIED	
22a. NAME OF RESPONSIBLE INDIVIDUAL Charles M. Farr, Major, USAF		22b. TELEPHONE NUMBER (Include Area Code) 513-255-3944	22c. OFFICE SYMBOL AFIT/LSP

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This thesis investigated the employment problems of the Peace Delta FMS program associated with the accelerated delivery of the F-16 aircraft. Three areas were considered during this study. The effect of accelerated delivery on maintenance and training, the effect on logistics support and the effect on the infrastructure of Peace Delta. The results of this project should be applicable to other FMS programs which involve accelerated delivery of a particular weapon system.

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