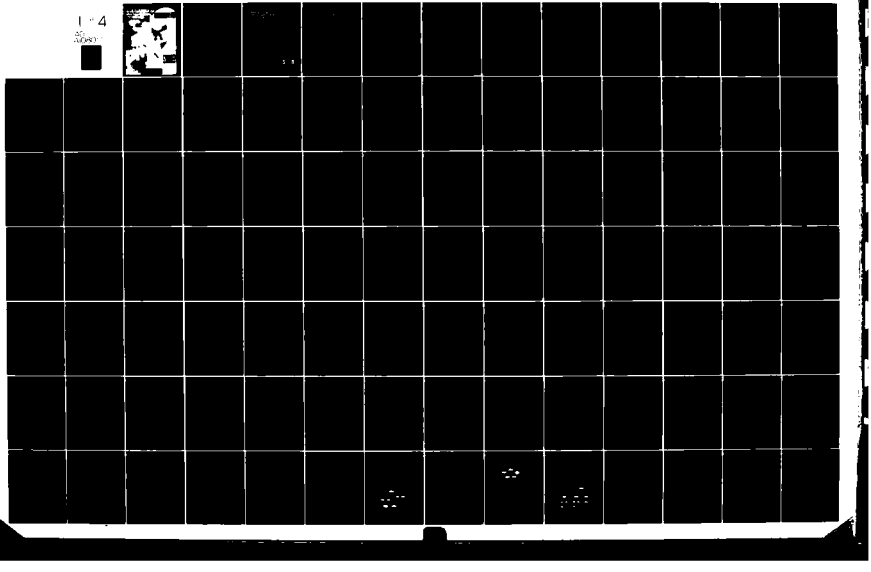
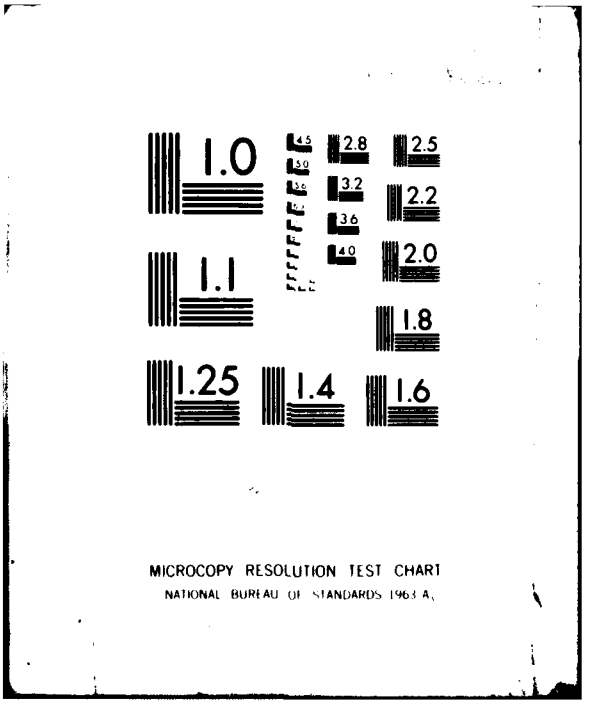
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This guide was published with the approval of the Undersecretary of Defense for Research and Engineering and the Joint Logistics Commanders. Its goal is to provide program managers, who have had experience with domestic programs, background and substantive information on the many special and complex features of multinational programs. The guide stresses the need for all managers to consider early in their programs the important objectives of rationalization, standardization, and interoperability (RSI).

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MANAGEMENT OF MULTINATIONAL PROGRAMS

A Handbook for Program Managers Involved in International Acquisition

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FOREWORD

Multinational Program Management offers an exceptional challenge to the Acquisition Manager. Effective management requires not only a comprehensive understanding of the needs and requirements of each nation involved, but also an understanding of the differences in logistic support, financial management, technology transfer, program management acquisition strategy, organization, foreign weapons evaluation, production, and disclosure of military information.

To assist the people involved in Multinational Program Management, the Joint Logistics Commanders have reviewed and approved the publication of this guide. It is designed to acquaint the newcomer with the multinational program environment and contains specific recommendations for achieving the required objectives of standardization and interoperability with our Allies. Recognizing that Multinational Program Management is a dynamic business, this manual will require periodic updating. The Commandant, Defense Systems Management College, has accepted the responsibility for administratively updating this manual. Your comments and recommendations should be forwarded to:

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PREFACE

The emphasis on Rationalization, Standardization, and Interoperability (RSI) is becoming an increasingly important element in weapon system management with the desire to attain greater international cooperation in all aspects of system development, acquisition and support. The purpose of this guide is to help a program manager to deal with the RSI features of international programs by relating his background in domestic programs to the special and even more complicated nature of international programs. The variety of topics covered in this guide attests to the complexity of the subject area.

The preparation of this guide was sponsored by the Deputy Undersecretary of Defense for Research and Engineering (Acquisition Policy). The material developed in this guide comes from a variety of sources identified in the footnotes and bibliography, with some participation in drafting the chapters by several knowledgeable people including: Mr. Robert Mayo, DARCOM; Dr. Franz Frisch, NAVSEA; SSG David Kim, DAIRO; Mr. James Dever, LMI; Mr. Frank Lukasik, AFSC; LTC Charles Wilson, OUSDP; Messrs. Richard Antolini and Thomas McCann, Analytics, Inc.; Mr. Lawrence Williams, DCAA; and Major Robert Golden, AFBRMC; and John Frields, DIS. An ad hoc research committee drawn from interested offices in the Office of Secretary of Defense and the Services reviewed each chapter in the guide and offered many helpful suggestions and corrections.

The principal authors of the guide are Professor John Fargher of the Defense Systems Management College and Dr. Murray A. Geisler of the Logistics Management Institute. Professor Fargher developed the structure of the guide and drafted several of the chapters, and Dr. Geisler edited and supervised its final processing to publication.

Aside from its usefulness to program managers of international programs, this guide should be of interest and help to the many other personnel involved in international programs both in this country and overseas. It must be recognized that the material presented in this guide is subject to change as circumstances require and experience demands. It is planned to issue revised editions of the guide periodically if found useful. However, program managers and other users of this guide must rely on official documentation for detailed decision-making and administration.

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1. INTRODUCTION

PURPOSE OF THIS GUIDE

RSI stands for Rationalization, Standardization, and Interoperability of weapon systems and procedures which have been primarily developed within the North Atlantic Treaty Organization (NATO) context, although these objectives are also being pursued in other U.S. alliance situations, such as the ABCA agreements among U.S., Great Britain, Australia, and Canada, and with other friendly nations. Selected other countries are being added to the RSI program. These include Switzerland, Israel, Egypt, Spain and Japan.

The single most important person in facilitating standardization and interoperability with our allies is the Program Manager, who is the Service's agent in managing the acquisition process. The purpose of this guide is to assist the Program Manager in managing a program in consonance with armaments collaboration objectives, including RSI, from inception through follow-on logistic support. It stresses the importance of his considering each new program as having potential international application in exercising program management, even though the decision to go international has not yet been made.

It is addressed to the experienced Program Manager and presupposes the basic skills and experience necessary to manage a domestic program. Political, legal, economic, and technical problems that have traditionally arisen during international programs are identified, and solutions that have proven successful in the past are included, where possible. Service-specific approaches are avoided; the focus is on information that previous Program Managers felt would have been helpful had they had it at the time. It is hoped that this guide will enable a Program Manager to avoid some of the pitfalls of the past, and increase the military effectiveness of NATO and other U.S. alliances by enabling armaments collaboration efforts to succeed.

ORGANIZATIONS RESPONSIBLE FOR RSI

There are many organizations that have a role to play in assuring that RSI becomes a reality. DoD Directive 2010.6 assigns responsibilities both to the Office of Secretary of Defense (OSD) and the Services. In addition, the State Department, Treasury Department, Office of Federal Procurement Policy, and other Federal agencies may have an impact on an international program. Where applicable, the roles of these agencies and the impact that they have on any specific procurement will be set forth in the appropriate chapter.

WHAT IS RSI?

There is some confusion as to the definition of rationalization, standardization, and interoperability (RSI). Rationalization means "any action that increases the effectiveness of allied forces through more efficient or effective use of defense resources committed to the alliance."[1] Armaments

[1]Department of Defense Directive, Number 2010.6 (March 5, 1980), "Standardization and Interoperability of Weapons Systems and Equipment Within the North Atlantic Treaty Organization," Enclosure 2(X).

collaboration is a crucial feature of rationalization. The second two terms, standardization and interoperability, are in a sense subsets of rationalization. Standardization has been defined as

> "the process by which member nations of NATO achieve the closest practicable cooperation among forces, the most efficient use of research, development and production resources, and agree to adopt on the widest possible basis the use of: a) common or compatible operational, administrative, and logistics procedures; b) common or compatible technical procedues and criteria; c) common compatible or interchangeable supplies, components, weapons, or equipment; and d) common or compatible tactical doctrine with corresponding organizational compatibility."[2]

Interoperability, the last of the three terms, is "the ability of systems, units, or forces to provide services to and accept services from other systems, units, or forces and to use the services so exchanged to enable them to operate effectively together."[3]

RSI, however, has come to symbolize more than the sum of its parts. It has come to represent the policy set forth in Public Law 94-361, Sections 802 and 803. This law, commonly referred to as the Culver-Nunn Amendment, is the legislative charter for NATO RSI. It states that, "It is the policy of the United States that equipment for use of personnel of the Armed Forces of the United States stationed in Europe under the terms of the North Atlantic Treaty should be standardized or at least interoperable with equipment of other members of the North Atlantic Treaty Organization."[4] In addition, this act provides that:

> The Secretary of Defense, shall, to the maximum extent feasible, provide for the acquisition of equipment that is standardized or interoperable with NATO.
>
> Acquisition procedures shall also take into consideration cost, functions, quality, and availability of the equipment to be procured.
>
> The Secretary of Defense shall report to Congress on all "offset" agreements entered into with NATO countries and on all major systems that are not standard or interoperable with other members of NATO.
>
> It is the "sense of the Congress" that RSI would be facilitated by greater reliance on licensing and coproduction agreements among NATO signatories.

---

[2] Ibid, Enclosure 2(Z).

[3] Ibid, Enclosure 2(P).

[4] Public Law 94-361, July 14, 1976, Section 802(a)(1).

IMPORTANCE OF ARMAMENTS COLLABORATION

The Defense Science Board Study of 1978 listed five major reasons why armaments collaboration is needed:

(1) The rate and quality of Soviet-Warsaw Pact conventional forces buildup.

(2) The increased dependence of NATO on conventional forces for deterrence and defense.

(3) Political and economic constraints on NATO defense budgets.

(4) The "input/output" efficiency of Alliance resources use.

(5) An increased desire of member states of the Alliance for self-sufficiency in high technology armaments.

The rate and quality of the Soviet and Warsaw Pact buildup has been the subject of much debate, but suffice it to say that it is more than is necessary for any defensive requirements. This buildup, "combined with rough parity in nuclear forces has resulted in an increased dependence by NATO on conventional forces for deterrence and defense." In addition, the projected lack of warning time in the event of an enemy attack makes the need for a coordinated response even more pressing.

The Soviets have been committing approximately 11 to 14 percent of gross national product to their defense budget, while the alliance has committed proportionately only about one-fourth to one-half that amount.[5] Inflation, energy shortages, and rising military manpower costs have created political and economic constraints on increasing defense spending within NATO. In addition, lack of sufficient standardization in equipment of the Alliance may have contributed to a less than efficient use of resources applied to development, production, and support.

Finally, as European defense industries have developed, so has their desire to be self-sufficient in high technology areas. This is viewed as a step towards independence and increased security, and beneficial economic spinoffs are expected. Even countries that can't support a broad spectrum of high technology areas desire to have some proficiency in selected areas.

U.S. GOALS FOR ARMAMENTS COLLABORATION

The United States goals for armaments collaboration are directly related to the issues just mentioned. The Defense Science Board found these goals to be:

(1) To improve NATO operational effectiveness

[5]Defense Science Board, 1978 Study on "Achieving Improved NATO Effectiveness through Armaments Collaboration," Summary, page 8.

(2) To increase efficiency in the allocation of Alliance-wide resources for research, development, and acquisition

(3) To strengthen NATO cohesiveness

(4) To encourage a politically stable and economically strong Western Europe and European defense industry.

In its report, the Defense Science Board endorsed the use of standardization and interoperability to achieve these goals.

To accomplish armaments collaboration through increased RSI, the United States has adopted a three-pronged program. As set forth in Department of Defense Directive 2010.6, it consists of

a. Establishment of general and reciprocal procurement Memoranda of Understanding (MOU) with NATO member nations to encourage bilateral arms cooperation.

b. Negotiation of dual production of developed or nearly developed weapon systems to permit other NATO countries to undertake production of identical systems.

c. Creation of families of weapons (program packages) for systems not yet developed to coordinate and share research and development of advanced weapon systems.

The Defense Science Board has termed the use of this program as a beginning toward greater arms cooperation. This triad approach is discussed more fully in Chapter 2 on Major RSI Approaches. Recent policy statements by senior DoD executives have supported the triad approach.

SIGNIFICANCE OF RSI

Standardization of weapon systems is NATO's long-term goal, while interoperability of such systems is its short-term goal. Here, the concept of standardization applies not only to the equipments themselves, but also to the planning for them, and to their operation and support. To facilitate achievement of these goals, program managers should take RSI considerations into account early in the life of their program if they are reasonably sure it will go international. In addition, early RSI planning can significantly improve opportunities for host nation support of U.S. weapon systems during their materiel fielding and deployment with U.S. forces overseas.

There are a variety of methods and techniques for internationalizing a program. These methods range from the United States adopting a European system to the Europeans adopting a U.S. system. In between these alternatives are codevelopment, coproduction, dual production, and acquisition of components that contribute to interoperability. It is the ability to know how to do business in Europe and with Europeans that is needed. This guide should answer that need by facilitating an individual's transition from domestic program manager to international program manager.

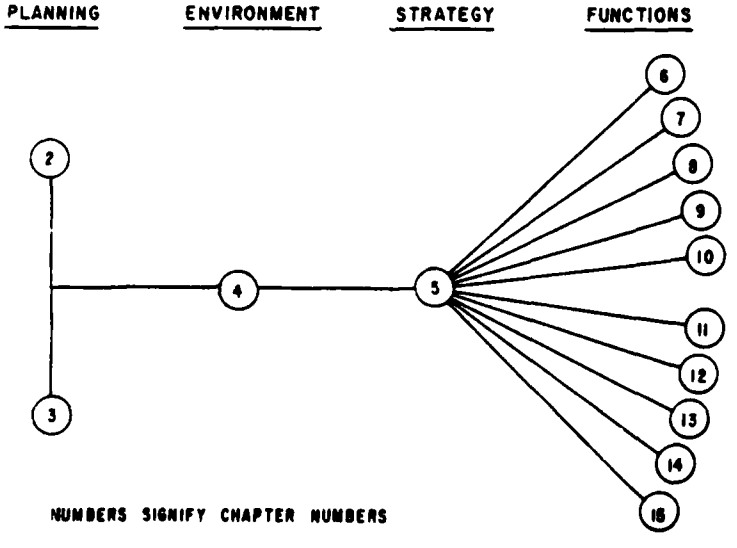
ORGANIZATION OF THE GUIDE

The guide contains 15 chapters and a number of related appendices, including a bibliography and a glossary. After this introductory chapter, the next 3 chapters primarily deal with the broad planning framework needed to address RSI, focusing especially on the central role of Memoranda of Understanding, the NATO acquisition planning systems including the NATO Armaments Planning Review (NAPR) and the Periodic Armaments Planning System (PAPS), and a general treatment of the European socio-economic environment.

The following chapter, Chapter 5, is most important because it deals with the acquisition strategy for conducting international weapon system programs. This strategy encompasses broad approaches to technology application, contracting, business and financial management, logistics, modes of acquisition, and organizational structure. This chapter thus describes a framework for tying together the subsequent functional activity required for a well-conducted program.

The next 10 chapters address the functional areas in some detail describing U.S. government, and especially DoD, policies and procedures for such functions as organizing program management, contract management, utilizing intellectual property, engineering management and technology transfer, financial management, foreign weapons evaluation, cooperating in manufacturing and production, logistics, controlling disclosure of military information, and facilitating necessary communication and information access. Some description of comparable European functional systems is provided with analysis of differences with the U.S. Many examples of past and ongoing international programs are presented to make the discussion more concrete. Figure 1-1 depicts the chapter structure of the guide.

FIGURE 1-1. CHAPTER STRUCTURE OF RSI GUIDE FOR PROGRAM MANAGEMENT



2. MAJOR RATIONALIZATION, STANDARDIZATION, AND INTEROPERABILITY (RSI) APPROACHES

BACKGROUND

United States interests in, and the trans-Atlantic dialogue on, NATO rationalization/standardization/interoperability could be said to have begun in earnest in August 1974 with the passage and signing of the DoD Appropriation Authorization Act for FY 1975, containing the first of a series of so-called Nunn-Culver amendments expressing Congressional interest in NATO standardization. Between August of 1974 and January of 1977, the United States and NATO allies in Europe moved cautiously on both sides of the Atlantic to develop their respective policies toward increased weapons cooperation and NATO rationalization and standardization. In the United States, the Congress added Culver-Nunn amendments to the DoD Appropriation Authorization Acts of FY 1976 and FY 1977. The latter provides for waiver of the Buy American Act in the larger interest of NATO standardization, expresses the sense of the Congress that "greater reliance on licensing and coproduction agreements" within NATO would facilitate standardization, and "encourages the governments of Europe to accelerate their present efforts to achieve European armaments collaboration among all European members of the Alliance" to obtain more realistic cooperation in defense procurement on the basis of a "two-way street" concept.

Early in 1975, the DoD began to attempt to coordinate efforts in support of NATO rationalization and standardization. By the end of 1975, OSD had written policy directives and guidance to the Services to support NATO standardization efforts. During 1976, the DoD sponsored contract studies on NATO standardization and licensing policy and on NATO standardization and technology transfer. The US also encouraged the NATO AC/94 Working Group on Intellectual Property to undertake an Alliance-wide review of national licensing policies and obstacles to co-production.

In Europe, the Eurogroup[1] Ministers called in November 1975 for greater efforts to rationalize European armaments planning and collaboration and laid provisional plans for creation of a staff or secretariat that could collect and collate information on European research and development and procurement programs to facilitate weapons cooperation within Europe. Following the NATO ministerial meeting of December 1975, an Ad Hoc Committee on Equipment Interoperability was created, and the Eurogroup initiative of November gave way to the creation of the Independent European Programme Group (IEPG) in February 1976. The IEPG has the distinct advantage, in comparison to Eurogroup, of including France as an active participant in European weapons cooperation at the political level. The Assembly of the Western European Union (WEU) also contributed to encouraging European rationalization by sponsoring a symposium on European armaments policy in Paris during March of 1977.

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[1]See the end of Figure 4-2 for a description of the different European organizations related to NATO, such as Eurogroup, Western European Union, and the Independent European Programme Group.

In 1977, activity within the US government to bring these trends to fruition increased greatly. A new DoD Directive (DoDD 2010.6) on NATO standardization was published in March 1977 directing all DoD Components to "include NATO standardization and interoperability goals as fundamental considerations in their development and procurement programs for both major and minor equipment items---". DoDD 2010.6 has subsequently been revised and republished on March 5, 1980 to incorporate DoD's latest policies on RSI, including the triad initiatives, which have also been approved in NATO.

RATIONALE FOR RSI OBJECTIVES

The general rationale for U.S. support of RSI objectives has been presented in laws passed by Congress and in accompanying congressional reports. According to Public Law 94-361, it is the policy of the United States that equipment procured for the use of personnel of the U.S. stationed in Europe under the terms of the North Atlantic Treaty should be standardized or at least be interoperable with equipment of other members of the North Atlantic Treaty Organization (NATO).

It is also the sense of Congress that weapon systems being developed wholly or primarily for employment in the NATO theater shall conform to a common NATO requirement in order to proceed toward joint doctrine and planning and to facilitate maximun feasible standardization and interoperability of equipment. A common NATO requirement shall be understood to include a common definition of the military threat to the NATO countries.

Since countries tend to view the nature of the threat and the means for responding to the threat differently, the process of requirements definition involves reconciliation and compromise. If this process can be performed successfully, cooperative arrangements can be worked out that permit use of such approaches as codevelopment, coproduction, licensing etc. Such cooperative arrangements will then facilitate the achievement of the objectives of greater standardization and interoperability of weapon systems and other common military activities in NATO.

This chapter describes the elements of the triad initiative currently being pursued in DoD to achieve RSI objectives, and reports on their status, and also presents a number of related topics. The next chapter discusses the NATO planning system which includes the NATO Armaments Planning Review (NAPR) and the Periodic Armaments Planning System (PAPS), both of which provide opportunities and mechanisms for resolving differences in requirements and in the approaches to satisfying these requirements.

THE TRIAD

The United States has undertaken a triad of major initiatives in its effort to achieve increased Alliance RSI:

1. Establishment of general and reciprocal Memoranda of Understanding (MOUs) with NATO member nations, ABCA, Japan and other allies. These are intended to encourage bilateral arms cooperation and trade, establish regular review of armaments programs and trade, and make efficient use of Alliance resources through expanded competition.

2. Negotiation of dual production or coproduction of developed or nearly developed systems. Under this approach, a nation that has already developed a system which is valuable to the alliance would permit others to produce this system and thus avoid the undertaking of redundant developmental programs. Dual production programs can lead to the near-term introduction of weapon systems with the latest technology in NATO's deployed forces and a more efficient use of resources. Coproduction is discussed in more detail in Chapter 12 on Manufacturing and Production.

3. Creation of families of weapons (program packages) for systems not yet developed. Under this concept, participating NATO nations would reach early agreement on the responsibility for developing complementary weapon systems within a mission area. The approach is to examine the weapons that member nations plan to develop in the next few years, aggregate these weapons by mission area, and then coordinate the development of equipment when feasible.

MEMORANDA OF UNDERSTANDING

The initial element of the triad consists of Memoranda of Understanding (MOUs) which have been a principal means of promoting RSI within NATO through cooperative action. The United States Department of Defense enters into reciprocal defense procurement and offset agreements with NATO, individual NATO governments, and other friendly governments, to purchase and sell defense equipment and logistics support. The objectives of these agreements may be of a general nature to provide for waiver of the "Buy National" restrictions; promote greater cooperation in research, development, production, and procurement to enhance standardization and interoperability; and provide guidance on supplemental specific memoranda of understanding. Figure 2-1 lists the different types of MOUs and agreements.

FIGURE 2-1. AREAS ADDRESSED IN MOUs AND INTERNATIONAL COOPERATIVE ARRANGEMENTS

General and Reciprocal Procurement MOUs
Umbrella-Type Research and Development MOUs
Program Specific MOUs

Patent Interchange (See Chapter 8 on Intellectual Property)
Funding Agreements (See Chapter 10 on Financial Management)
Security Agreements (See Chapter 14 on Disclosure of Military Information)
Quality Assurance Agreements (See Chapter 12 on Production and Manufacturing)
Data Exchange Agreements
Standardization Agreements (STANAGs)

General and Reciprocal Procurement MOUs

The General and Reciprocal Procurement MOUs that have been signed with other NATO nations are essentially the same and have the common theme of eliminating barriers such as "buy national" and import tariff penalties, and opening defense markets to competition on a reciprocal basis. Governments are

responsible for informing industry of their policies and procedures, and industry is responsible for pursuing business opportunities. In all, 10 such MOU agreements have been signed including: Belgium, Canada, Denmark, France, Germany, Italy, the Netherlands, Norway, Portugal, and the United Kingdom. In addition, in March 1980, the U.S. and Turkey signed an "Agreement for Cooperation on Defense and Economy." Supplement #2 to that agreement concerns defense industrial cooperation, the equivalent of a general procurement MOU. An agreement with Greece will probably follow the model of the Turkish agreement. With the conclusion of the MOU with Greece, all NATO countries except for Iceland and Luxembourg will have these MOUs with the U.S.

A Memorandum of Agreement (MOA) was concluded with Israel in March of 1979 which accomplishes the same arrangement as General and Reciprocal Procurement MOU's discussed above, but is applicable only for specific lists of programs, items, and services. Negotiations with other non-NATO countries appear to be following the same restricted pattern.

Research and Development MOUs

Agreements on "Mutual Cooperation in Research and Development, Production, Procurement, and Logistics Support of Defense Equipment" have been approved with those countries listed in Figure 2-2.

FIGURE 2-2. "MUTUAL COOPERATION IN THE RESEARCH AND DEVELOPMENT, PRODUCTION, PROCUREMENT, AND LOGISTICS SUPPORT OF DEFENSE EQUIPMENT MOUs"

Signed	Pending
Germany	Belgium
Italy	Denmark
Netherlands	Greece
United Kingdom	Portugal
	Turkey

The Secretary of Defense has issued blanket waivers of the "Buy America" Act for those countries with which we have Reciprocal Procurement MOUs. Further, DoD has normally waived the "Buy America" Act for countries with offset arrangements. Specific waivers are set forth in the U.S. Defense Acquisition Regulation (DAR), Section VI. Waiver of the "Buy American Act" and making the majority of U.S. defense articles eligible for competition and reciprocal actions by NATO nations constitute significant progress in developing the "two-way street" that NATO member nations have been seeking.

Program Specific MOUs

The "general" or umbrella MOUs give only general guidelines regarding program objectives, such as reciprocal or "fair opportunity to participate in production" agreements. A "specific" MOU is usually required to cover each particular program. An example is the multilateral MOU (U.S., Belgium, Denmark, Netherlands and Norway) relating to procurement, coproduction and offset arrangements of the F-16 aircraft (1975). Each General and Reciprocal

Procurement MOU sets the tone for reciprocity, but often the details must be presented in separate technical agreements, which might cover financial arrangements, cost sharing formulae, or additional coproduction. Thus, industries almost always require licenses to manufacture parts, components, or end items. Industrial "know-how" and other intellectual properties may be released to a foreign manufacturer, with appropriate restrictions on their use. Other non-governmental agreements, such as quality control and inspections, may also be negotiated between U.S. and foreign industries. These detailed understandings are contained in technical agreements which are appended to the MOUs.

Some examples of program specific MOUs are:

- Cooperative Research and Development. Cooperative research and development is any method by which governments cooperate to make better use of their collective resources to include technical information exchange, harmonizing of requirements, codevelopment, interdependent R&D, and agreement on standards. In a general MOU dealing with R&D, the U.S. and the Federal Republic of Germany agreed that, consistent with their relevant laws and regulations, they would give fullest consideration to all requests for cooperative R&D. Subsequently, the USG and Germany negotiated a specific MOU for a cooperative research project in the field of helicopter flight control. The project provides for complementary efforts and an exchange of the results and rights thereto.

- Cooperative Test and Evaluation. A good example of cooperation can be found in the case of the ROLAND 2 all-weather, short-range, air defense system. The U.S. Army decided to test operational and performance capabilities of the ROLAND 2 before final U.S. contractor fabrication of prototypes. The German Federal Ministry of Defense wished to participate in the tests to obtain additional technical and operational data. An MOU resulted, setting forth the rights and responsibilities of the parties to the joint test. In addition, several NATO nations have signed an MOU with the U.S. to participate in evaluation of the U.S. Army's Combat Net Radio, SINCGARS-V.

- Coproduction. An example of a specific coproduction agreement occurred when Belgium, Denmark, the Netherlands, and Norway decided upon the F-16 to replace their aging F-104s and other aircraft. As a consequence, an MOU was negotiated providing for European industrial participation in F-16 production. Other coproduction agreements signed or under consideration include the ROLAND, the U.S. COPPERHEAD, MOD FLIR (Modular forward-looking infrared), STINGER, and AIM-9L (IR air-to-air missile).

MOUs have been drafted and negotiated to meet the needs of each bilateral or multilateral situation. There are specific mutually agreed guidelines for all such arrangements. Appendix A contains a description of an MOU, which specifies each section appropriate to the MOU, explains the rationale of each section, and identifies those areas that require significant

consideration. It is not intended to be an exact format, but a general structure and checklist of critical considerations.

DUAL PRODUCTION

Dual production constitutes another of the elements of the triad. U.S. proposed in early 1978 a list of 17 candidate systems for European dual production. At the October 1979 Conference of National Armament Directors (CNAD), the Independent European Programme Group (IEPG)[2] reported that it had unanimous interest only in the STINGER Manportable Air Defense System and that other programs should be pursued on a bilateral or multilateral basis with interested nations. IEPG also asked U.S. to identify those European systems that U.S. may wish to dual produce. Since this early beginning much progress has been achieved in many programs. Programs presented in this section are divided into three categories: U.S. consideration of European and Canadian systems, European and Canadian consideration of U.S. systems, and cooperative weapons programs. Their status is as of January, 1981.

U.S. Consideration of European and Canadian Systems

(1) Armor Machine Gun. The U.S. Army has adopted the Belgium MAG-58 produced by Fabrique Nationale. Various versions of this Belgium weapon are already in the inventories of six NATO countries: UK, Belgium, the Netherlands, Greece, Luxembourg and Portugal. Fabrique National is also building a plant in Columbia, South Carolina to produce the weapons here, which provides a domestic production base.

(2) ROLAND Air Defense Missile System. The U.S. ROLAND, an all-weather, highly-mobile, short-range air defense (SHORAD) system designed for use primarily against low-altitude, high-performance aircraft, is produced under license from France and Germany. There will also be a cooperative logistics support system in Europe.

(3) Artillery Battery Computer System. The Battery Computer System is a small, state-of-the art ballistic computation and fire control system providing firing data for up to 12 weapons. It is a joint program between Norden Systems of United Technologies and UK's Marconi Space and Defense System, Ltd.

(4) Chemical Defensive Equipment. Current equipment is of U.S.-UK manufacture. Follow-on equipment from several countries including UK, Norway, the Netherlands, and Canada is being evaluated.

(5) Heavy Expanded Mobility Tactical Truck (HEMTT). It is planned that the German Maschinenfabik Augsberg-Nuernberg (M.A.N.) truck be fielded with the Army's PERSHING II System and the Air Force's Ground Launched Cruise Missile (GLCM).

(6) Artillery Mortar Fuze. The Norwegian Proximity Point Detonating (PPD) 440 Fuze is designed to be used on Army high-explosive and

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[2]See Figure 4-2 for description of the IEPG under "European Organizations."

mortar ammunition. In addition, the Air Force is evaluating it for bomb munitions. It is still in the engineering development stage, and is therefore several years from production.

(7) 120 mm Tank Gun. In January 1978, the US Army selected the German 120 mm smoothbore tank gun system for future incorporation into the US XM1 main battle tank. The development program began in March 1979, and involves technology transfer, fabrication and test of the system. Production is expected in late 1984.

(8) Combat Support Boat. The U.S. Army has evaluated and adopted the UK Army's Combat Support Boat (CSB) to satisfy its requirement for a new ribbon bridge erection boat.

(9) Artillery Systems. The SP70 is a self-propelled howitzer being developed by UK, Germany and Italy. The U.S. has expressed interest in monitoring the development of the SP70.

(10) Giant Viper. The Giant Viper is a UK-developed mine clearing device, which is being considered by the U.S. Army based on its early evaluation.

(11) European Telephone System. The European Telephone System is used for day to day garrison communication. Following evaluation of U.S. and German replacement proposals, the Deutsche Bundespost (DBP) was selected.

(12) Squad Automatic Weapon (SAW). The SAW System will be a lightweight one-man portable machine gun. Following a competitive evaluation of 4 candidate weapons, the Belgium Fabrique Nationale (FN) MINIMI was chosen to be developed further. The Canadians are also interested in the SAW.

(13) OTO MELARA Compact Gun. The MK 75 gun mount designed by OTO MELARA of Italy is a fully-automatic, remotely-controlled, light-weight weapon system firing 76 mm ammunition. It is produced in Italy and will also be produced in the US under license.

(14) PENGUIN Missile. This is a Norwegian-produced system for use on boats as a short-range surface to surface anti-ship missile. Earlier versions are in use by other NATO navies. The U.S. is evaluating a follow-on version.

(15) EIFEL/DISTEL Program. This is a German-developed command and control system now being used in two NATO Allied Tactical Operation Centers (ATOC) operated by Germany. U.S. is collaborating with Germany on a follow-on version.

(16) RAPIER Air Defense Missile System. The USAF intends to procure British-built RAPIER air defense missile systems. Negotiation on an MOU for this system is well under way.

(17) KC-135 Re-Engining (CFM-56). In January 1980, the US Air Force selected the French-built CFM-56 (GE-SNECMA) engine on a competitive basis for the KC-135 re-engining program. An MOU with France on this program has been concluded.

(18) Advanced Short-Range Air-to-Air Missile (ASRAAM). Under the terms of the recently signed MOU for development of a family of air-to-air-missiles, the U.S. will develop an Advanced Medium Large Air-to-Air Missile (AMRAAM), and a NATO consortium led by Great Britain and Germany will develop ASRAAM.

(19) Towed Aerial/Gunnery Target. The SECAPEM-90/B Aerial Gunnery Tow Target is a French designed and developed target now being built under license in the U.S.

(20) Airfield Attack Systems. The U.S. Air Force has been testing several foreign airfield attack munitions including DURANDEL, being produced by MATRA of France and another French runway-attack weapon, the Thomson-Brandt BAP-100.

European and Canadian Consideration of U.S. Systems

(1) PATRIOT. Seven NATO Nations (Belgium, Denmark, France, Germany, Greece, the Netherlands, and the U.S.) have signed a NATO PATRIOT MOU which established a multinational PATRIOT Program Steering Committee and a full-time management organization.

(2) Improved TOW. NATO allies have expressed interest in upgrading their current TOW inventories with the improved TOW. The U.S. Army is analyzing the problem of how best to provide improved TOW to allies on a timely basis.

(3) Ribbon Bridge. Currently, Germany is producing the Ribbon Bridge under U.S. license with an approved sales territory covering the NATO countries, Sweden and Switzerland.

(4) Improved HAWK Surface to Air Missile. Denmark, France, Germany, Greece, Italy and the Netherlands have adopted the improved HAWK system. A contract for conversion of the Belgium system has also been signed.

(5) STINGER. STINGER is an advanced, man-portable air defense system. NATO allies have demonstrated considerable interest in STINGER. Germany plans to lead a European consortium which will produce STINGER under license. An MOU is expected to be signed with Germany in 1981.

(6) Single Channel Ground and Airborne Radio Subsystem (SINCGARS-V). The SINCGARS-V program will provide the next generation of combat net radios for mid-1980's. A UK company is one of the subcontractors on the program. The U.S. has offered NATO nations the opportunity to participate to facilitate standardization. Also, a separate MOU was signed between the U.S. and Germany in 1980.

(7) Modular Forward-Looking Infrared Equipment (MOD FLIR). An MOU with Germany for the sale and coproduction of MOD FLIR became effective in April 1978. An MOU for coproduction and sale of MOD FLIR between the U.S., Germany, and the Netherlands was signed earlier this year.

(8) COPPERHEAD 155 mm Munitions. A bilateral MOU with the UK on COPPERHEAD was signed in June 1978. This MOU provides for the acquisition of

COPPERHEAD by the UK, at its option, through Foreign Military Sales or coproduction.

(9) Stand-off Target Acquisition System (SOTAS). The advanced development model has been demonstrated to UK, German, and Canadian forces. All three nations have expressed interest in further opportunities to evaluate or observe the system.

(10) Fighting Vehicle Systems. Efforts continue to harmonize U.S. and UK interests in this program area. The U.S. IFV/CFV is already in production.

(11) M735 Tank Gun Ammunition. It has been offered to NATO for coproduction.

(12) Division Air Defense (DIVAD) Gun. Several NATO nations (including Norway, Italy, and the UK) have expressed interest in the DIVAD gun.

(13) VIPER. Coproduction of VIPER has been offered to our NATO allies; interested countries to date include Norway, the UK, Germany, and Belgium.

(14) Advanced Attack Helicopter (AAH). It is designed so it can be coproduced and integrated into a variety of helicopter airframes to promote standardization.

(15) BLACK HAWK. NATO nations have been briefed on this aircraft system.

(16) HELLFIRE. The HELLFIRE System has been briefed to NATO with interest shown by Germany, the UK, Norway, France, Canada, and Italy, as well as Australia and Sweden.

(17) M483A1 Improved Conventional Munition (ICM). The M483A1 is designed and manufactured in accordance with a 155 mm MOU among the U.S., UK, Germany and Italy, and should be interoperable with their artillery. The M483A1 ICM has been nominated for NATO coproduction and a U.S./Netherlands dual production MOU was signed on 22 October 1980.

(18) Remotely Piloted Vehicles (RPV). An MOU was signed with the UK in October 1980 for exchange of RPV information in order to promote interoperability. A joint U.S./German military equipment characteristics document (MECD) was signed in May 1979 that defines the RPV characteristics that would meet the requirements of both countries.

(19) Scatterable Mines. The Remote Antiarmor Mine (RAAM) and the area Denial Artillery Munition (ADAM) are part of a family of scatterable mines. Both ADAM and RAAM have been offered to NATO for coproduction.

(20) HARPOON Anti-Surface Ship Missile. HARPOON is currently used by the U.S., the Netherlands, Denmark, Turkey, and the U.K., as well as Australia and the Republic of Korea. Other countries have indicated a desire to procure the HARPOON weapon system for their navies.

(21) P-3 Patrol Aircraft. The P-3 has a primary mission of anti-submarine warfare (ASW). It is presently operated by the U.S. and Norway. Canada has contracted to procure a derivative of the P-3, and the Netherlands has agreed to purchase 13 P-3 aircraft.

(22) SPARROW Advanced Monopulse Missile (AMM) AIM/RIM-7M. The SPARROW AIM-7M will be interoperable in all NATO aircraft which now carry AIM-7F missiles, and the RIM-7M, a surface-to-air version, will go in all NATO SEASPARROW surface missile systems.

(23) AIM-9L Infrared Air-to-Air Missile. As a result of an MOU signed by the U.S. and Germany in 1977, Germany heads a European consortium to coproduce the Navy-developed AIM-9L.

(24) High Speed Anti-Radiation Missile (HARM). HARM is being considered in the NATO air-to-ground family of weapons and is a candidate for NATO dual production.

(25) Advanced Medium-Range Air-to-Air Missile (AMRAAM). In August 1980, an MOU was signed with Alliance participating nations for a cooperative program for a family of air-to-air missile systems. Per the MOU, the U.S. will develop AMRAAM for use by all participants. The AMRAAM Joint System Program Office has initiated actions to inplement the MOU.

(26) F/A-18 Naval Strike Fighter Aircraft. Canada recently selected the F/A-18 as its new combat fighter for service into the 1980s. There will be Canadian industrial participation in the production. Canada and the U.S. are currently negotiating an MOU to define those program aspects which Canada wishes to implement under Security Assistance.

(27) Joint Tactical Information Distribution System (JTIDS). Many actions are underway to have this system either adopted in NATO or to make it compatible with the systems of other NATO countries.

(28) F-16 Multinational Fighter Program. In June 1975, the U.S. and four European participating governments (EPG)- Belgium, Denmark, the Netherlands, and Norway - signed an MOU for the F-16 Multinational Program. Teamed with the U.S. for the coproduction and co-assembly of the F-16s, the EPG partners produce avionics, the engine, and the aircraft.

(29) Precision Location Strike System (PLSS). Bilateral discussions are continuing with NATO allies to explore the extent of possible NATO participation in the program and NATO use of the system.

(30) NAVSTAR Global Positioning System (GPS). The European/ Canadian nations are showing an increasing interest in GPS.

(31) GBU-15. The following countries have requested and received GBU-15 information: Australia, Canada, F-16 consortium countries, Israel, Germany, Greece, Italy, Japan, Korea, Spain, Turkey, and the UK.

(32) AGM-65 Maverick. AGM-65A missiles have been sold to Turkey, Greece, Sweden, Iran, Israel, Saudi Arabia and Korea. Germany, the Netherlands and Italy have expressed interest in obtaining the MAVERICK missile.

(33) F-4 Fire Control System. In 1976, the U.S. and Germany signed an MOU governing a joint program to develop, test and procure a common digital computer (LRU-1) for the F-4.

Cooperative Weapons Programs

(1) Main Battle Tanks. Countries playing an active role in this effort are the U.S., UK, Germany, France and Canada.

(2) Antitank Guided Weapon Program (ATGW). An MOU for exchange of information was signed by France, Germany, the UK, and the U.S. in May 1980.

(3) Multiple Launch Rocket System (MLRS) (Formerly GSRS). A basic MOU on a cooperative program for a Medium Multiple Launch Rocket System was signed by the U.S., the UK, Germany, and France in July 1979.

(4) Helicopter Systems. In this area, the U.S. is cooperating with Germany, France and Italy primarily in the technology of electro-optic sensors for helicopters.

(5) 155 mm Howitzer Ammunition. In 1978, the U.S., UK, Germany and Italy signed an MOU on 155 mm weapons and ammunition standardization.

(6) Helicopter Ammunition. Interoperability of 30mm ammunition in the guns of UK, France and the U.S. is under test and evaluation. An MOU on 30mm ammunition is being coordinated with the UK and France.

(7) NATO Small Arms Ammunition. In late 1976, eleven NATO countries including the U.S. signed an MOU for the test, evaluation, and selection of a second NATO-standard caliber of small arms ammunition.

(8) 20-40 mm Ammunition. An ad hoc group made up of technical members from the UK, Germany, France, and the U.S. has been working for the past three years to reach agreement on standard families of ammunition in calibers between 20-40 mm. A formal MOU, expected to be signed in 1981, will call for consultation before the introduction of any new round of ammunition.

(9) Military Bridging. A family of tactical bridges for 1985 and beyond is under development in a trilateral U.S., UK and German program.

(10) NATO SEA SPARROW Point Defense Missile System (NSSMS). The development of NSSMS has been an international cooperative venture involving Belgium, Denmark, Italy, the Netherlands, Norway and the U.S. under an MOU for development and production signed in 1968. The MOU was subsequently signed by Germany.

(11) Rolling Airframe Missile (RAM). The RAM program in the U.S., Germany, and Denmark is in joint full-scale development, following two years

of advanced development by the Germany and the U.S. An MOU was signed in April 1979. Belgium, the Netherlands, Norway, and Canada have observer status in the program.

(12) NATO Patrol Hydrofoil Missile Ship (PHM). The PHM is the product of a cooperative program with Germany and Italy. Only U.S. is producing PHM ships at this time.

(13) ERMISS Minesweeping System. The U.S. Navy is a full participant in the ERMISS Project group which includes France, Germany, the Netherlands and the UK. The project began research work in late 1978 under an MOU signed by the participating countries.

(14) Mine Countermeasures (MCM) Ship Mission Equipment. Under the auspices of the NATO Navy Armaments Group (NNAG), an ad hoc working group from Belgium, Denmark, France, Germany, Italy, the Netherlands, Norway, UK and the U.S. is defining a NATO family of MCM equipment on which to base current and future work in this area.

(15) HARRIER Vertical/Short Takeoff and Landing (VSTOL). The UK-procured AV-8A HARRIER V/STOL aircraft has been operational in the U.S. Marine Corps since 1971.

(16) Infrared Search and Track (IRST) System. The U.S. is cooperating with Canada in the development of a shipboard Infrared Search and Track (IRST) system. Other nations, including Belgium, Denmark, France, Germany, Italy, the Netherlands, Norway and the UK have been apprised of U.S./Canadian progress on IRST and have been invited to join this effort.

(17) Variable-Depth SONAR (VDS) Trials. As part of the U.S. effort to develop alternative missions for the Patrol Hydrofoil Missile Ship (PHM), Canada and the U.S. signed an MOU for joint VDS trials.

(18) Sonobuoys. The U.S. Navy continues to be heavily involved in NATO sonobuoy interoperability.

(19) NATO SEA GNAT. NATO SEA GNAT is a cooperative R&D project which includes the UK, Germany, Denmark, Norway and the U.S.

(20) Expendable Harassment Drone (LOCUST). The LOCUST is an expendable anti-radar system that is being codeveloped by the U.S. and German Air Forces, which is also of interest to other NATO countries.

(21) NATO Airborne Early Warning and Control (AEW&C) Program. The NATO E-3A force will be operated by multinational crews from the participating Alliance nations. Participating nations are currently negotiating an MOU for follow-on operations and support. The acqusition activities are managed by the NATO AEW&C Program Management Agency (NAPMA).

(22) Low-Altitude Airfield Attack System (known as JP-233). This program has provided for U.S. share of the joint U.S./UK full-scale development of the JP-233 weapon system, which includes submunitions for aircraft attacks against enemy airfields.

FAMILIES OF WEAPONS

The last element in the triad is the concept of a family of weapons. It is a new approach for promoting arms cooperation. Central to the concept is the belief that some of the shortcomings of individual weapon system collaborations can be eased or overcome by a collaboration that encompasses several systems in a specified functional or technological family. The Defense Science Board in its 1978 report assessed the pro's and con's of the family of weapons, and although raising doubts as to its merit and viability, did endorse the attempt to make it work, stressing that codevelopment and coproduction arrangements must be included.

Agreements have been reached by the CNAD on two families: Air-to-Air Missile family and Anti-Tank Guided Weapons family. As to the Air-to-Air Missile family, an MOU covering the Advanced Short-Range Air-to-Air Missile (ASRAAM) and the Advanced Medium-Range Air-to-Air Missile (AMRAAM) has been signed by the UK, U.S., Germany and France. The UK and Germany are to develop ASRAAM, while the U.S. will develop AMRAAM. France has signed under special conditions whereby it has an option to participate in the ASRAAM program at a later date. There are also provisions for other NATO countries to join if they so desire. Both sides will establish production lines for the manufacture of each other's weapons under license. As to the Anti-Tank Guided Weapons (ATGW) family, a European consortium has proposed to develop a long-range ATGW and U.S. may develop a medium-range, manportable system. The approved MOU covers the conduct of a feasibility study of a third generation ATGW package, and the exchange of information.

The remainder of this chapter contains topics that are closely related to the subject of international agreements including contracting with foreign sources, guidance on offsets, related FMS legal and administrative considerations, and assignment of negotiating authority for international agreements.

CONTRACTING WITH FOREIGN SOURCES

To facilitate multinational cooperation, the Secretary of Defense has also established that contractors in countries with general and reciprocal MOUs will be provided access to all solicitations, conferences, and briefings to industry, subject to the provisions of the National Disclosure Policy, implemented in DoD by DoD Directive 5230.11 and DoD Instruction 5230.17. Decisions to deny access to foreign sources covered by the MOU must be made at a level no lower than the Office of the Service Under Secretary or Director of a Defense Agency. The Deputy Secretary of Defense requires advance notification of proposed denials of classified information relating to equipment standardization or interoperability within NATO, or that would preclude major international cooperative research, development, and logistics undertakings. All disclosure actions related to equipment standardization or interoperability are to be reported to the Foreign Disclosure Automated Data System (FORDAD) within 15 days on DD Form 1822.[3]

[3]Secretary of Defense Memorandum, Subj.: Disclosure of Classified Military Information of NATO Countries, dated 8 October 1979.

The general MOUs also promise that the DoD will solicit for products from those countries with which we have signed agreements. Defense Acquisition Circular No. 76-25, which represents a part of Section VI of the DAR, provides the procedures for the solicitation and evaluation of offers from countries which have an MOU, a Foreign Military Sales (FMS)/ offset arrangement or a defense cooperation agreement with the U.S.

Evaluation of bids and proposals from prime contractors and subcontractors of countries with general MOUs will include neither price differentials under Buy National laws and regulations nor cost of import duties. However, MOUs do not apply to items set aside for the mobilization base (with the exception of Canada, which is considered part of the U.S. mobilization base), or to items restricted to U.S. sources by statute (ships, jewel bearings, specialty metals, non-perishable subsistence, clothing and textiles, small business set aside, etc.).

GUIDANCE ON OFFSETS

Offset arrangements are another tool used to promote cooperation in acquisition. Offset arrangements involve agreements between countries that provide the procedures for the country that is making the major FMS purchase to balance out the trade and expenditures involved, by the selling country agreeing to make offsetting purchases from the other country. The U.S. has offset agreements with a number of countries, some of which have been made part of general and reciprocal MOUs. These countries include Australia, Norway, Switzerland and Belgium.

Contracts awarded under offset arrangements for U.S. requirements will be competitive, and items being acquired must meet fully contractual requirements for performance, quality, and delivery schedule. Under current DoD policy, it is not standard procedure to enter into coproduction agreements that obligate the DoD and other USG agencies to place orders for systems or components in foreign countries. DoD policy also does not require U.S. contractors to place subcontracts in foreign countries as a condition for the sale of U.S. defense articles to those countries. Exceptions can be made when there is no feasible alternative to ensure successful completion of transactions considered important to U.S. national security interests.

The Secretary of Defense has provided the following policy: "When compensatory agreements are deemed necessary, the following general guidelines will apply:

1. Agreements should be structured as broadly as possible, to obtain maximum credit for U.S. purchases of defense and nondefense goods and services, regardless of technology content.

2. Specific offset targets should be avoided, whether stated in percentage or money terms.

3. Agreements should be used as vehicles for reducing or waiving administrative barriers to defense trade by all parties, e.g., Buy National regulations, practices, and procedures.

4. Foreign firms bidding on contracts in accordance with the terms of an offset agreement must actively seek bidding opportunities and compete on an equal basis with U.S. firms.

5. Agreements involving system specific arrangements should state that the burden for fulfilling any commitment rests with the U.S. firms directly benefitting from the sale.

The Assistant Secretaries of Defense for International Security Policy (ISP) and International Security Affairs (ISA),[4] in coordination with the Under Secretary of Defense for Research and Engineering (USDRE), the Assistant Secretary of Defense, Manpower, Reserve Affairs, and Logistics (MRA&L), Office of General Counsel (OGC), and Defense Security Assistance Agency (DSAA), will be responsible for reviewing all proposed compensatory agreements to which the DoD will be a party, to determine if the agreements comply with the above principles. The findings of this review will be forwarded to the Deputy Secretary of Defense, the authority to approve compensatory agreements with other nations for the DoD.

The Under Secretary of Defense for Research and Engineering (USDRE), in coordination with ISP, ISA, MRA&L, OGC, DSAA, and the military departments, will be responsible for publishing a semiannual report setting forth the status of all existing and proposed compensatory coproduction and offset agreements. Such reports will highlight the U.S. financial obligation and provide other details as required."[5]

RELATED FOREIGN MILITARY SALES POLICY AND LEGAL CONSIDERATIONS

Foreign Military Sales (FMS) rules, as well as laws dealing with FMS, have a bearing on RSI activities. This section discusses salient aspects of such legal and administrative considerations.

Policy Toward U.S. Contractors

The Director of the Defense Security Assistance Agency (DSAA) is the focal point in the Department of Defense to deal with U.S. contractors on matters involving foreign arms sales. The military departments are responsible for preparing approved letters of offer and implementing and administering approved sales.

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[4] In a just-effected reorganization of the Office of the Undersecretary of Policy, there has been a reallocation of responsibilities involving a new Assistant Secretary for International Security Policy (ISP) and the Assistant Secretary for International Security Affairs (ISA). ISP is responsible for all of NATO, other European countries and the USSR. ISA will continue to be responsible for all political-military activity related to international security, except NATO, other European countries and the USSR. Since this reorganization is so new, other activities now shown in this guide as the responsibility of ISA may subsequently transfer to ISP or be jointly shared.

[5] Secretary of Defense Memorandum, Subj.: General Policy on Compensatory Coproduction and Offset Agreements with Other Nations, dated 4 May 1978.

The Secretary of State has issued new policy on dealings with U.S. contractors relating to overseas sales along the following lines.[6] U.S. industry is viewed as a valuable partner in promoting U.S. security and that of our friends and allies. Government and industry cooperation can be facilitated by the way in which overseas U.S. personnel provide services to industry. Accordingly, U.S. agencies should treat representatives of U.S. firms selling arms with the same courtesies as other U.S. businessmen and may supply basic business information and services to them (e.g. access to commercial library, names and addresses, information about local customs, regulations, and commercial law). The agency may also provide non-sensitive background information on the organizational structure of the host government and defense forces, its defense budget, funding limitations and whatever U.S. funding assistance is available.

If a U.S. firm has been granted a license to release technical data in support of sales promotions, or other marketing efforts in the host country, and subject to local conditions, the following additional services may be afforded by U.S. agencies to representatives of U.S. firms upon request:

- Assistance in arranging appointments with host government officials and guidance on which officials to contact.

- General advice on tactics for securing sales in the host country.

- Informing the host government that the U.S. government has approved, in principle, the marketing effort as evidenced by issuance of a license.

At the same time, requests from U.S. firms or their representatives for special support of any kind which would directly encourage, promote, or influence the purchase by a foreign government beyond the guidance given above, or which would imply that the U.S. government is likely to provide financing for such a sale, should be cabled to DSAA for a ruling. In this connection, U.S. agencies are reminded that Section 515(H) of the Foreign Assistance Act quoted below remains in force:

> "The President shall continue to instruct United States diplomatic and military personnel in the United States Missions abroad that they should not encourage, promote, or influence the purchase by any foreign country of U.S.-made military equipment, unless they are specifically instructed to do so by an appropriate official of the Executive Branch."

In addition, the Arms Export Control Act requires prior approval of the State Department before a U.S. contractor may make a proposal or presentation intended to sell significant combat equipment valued at $7 million or

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[6]Unclassified Priority Message from Under Secretary of State Buckley, dated April 3, 1981, Subject: Conventional Arms Transfer Policy: Modification of Guidelines re Services to Be Provided Representatives of U.S. Firms Selling Defense Articles.

more for use by the armed forces of a foreign country. Any acts by U.S. contractors at variance with this requirement, brought to the attention of any Defense Department official, are to be reported immediately to the Director, DSAA.[7]

President's FX Policy

In a waiver to PD-13, dated 3 January 1980, the President allowed contractor funded development and marketing of weapon systems specifically intended for the purpose of Foreign Military Sales, in particular, the FX. The FX systems are not planned for the U.S. aircraft inventory. Although the current FX competitors (F-16/J79 and F-5G/F404) are not planned for NATO inventories, the precedent set by this waiver could possibly lead to some deterioration of RSI in the future.

Some Provisions of U.S. Laws Applicable to NATO

Provisions of the Foreign Assistance Act (FAA) of 1961 and the Arms Export Control Act (AECA), which reflect the highly positive attitude toward the NATO alliance are:

- Exemption of cooperative cross-servicing arrangements among NATO members from the 30-day notification requirement to Congress (Section 3(d)(3), AECA).

- The President may reduce or waive asset user charges and nonrecurring costs of research, development, and production of major defense equipment. (Section 21(e)(2), AECA).

- The President may enter into cooperative training based upon reciprocity and reimbursement for only direct costs (Section 21(g), AECA).

- Potential sales to NATO, Australia, Japan, and New Zealand need not be included in the Annual Arms Sales Proposal to Congress (Section 25(d), AECA).

- Exclusion of NATO members from reporting/certification requirements for commercial technical assistance or manufacturing licensing (Section 36(d), AECA).

- Exclusion of NATO members, Australia, Japan, and New Zealand from (now $100 million) ceiling on commercial licensed sales of major systems (Section 38(b)(3), AECA).[8]

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[7]Deputy Secretary of Defense Memorandum, Subj.: Contacts with Industry Regarding Foreign Arms Sales, dated 4 May 1978.

[8]This ceiling was increased from $35 million to $100 million in Section 38, AECA by the International Security and Development Cooperation Act of 1980 (Public Law 96-533).

- Exclusion of NATO from the prohibition on sale of articles classified as prepositioned material configured to unit sets (POMCUS), as decremental stock, or as prepositioned war reserve stocks (Section 815, 1979 Defense Appropriation Authorization Act).

- Exclusion of NATO from the dollar ceiling on defense equipment set aside as a war reserve stock in stockpiles located in foreign countries, intended for use by allied or other foreign countries (Section 514(b)(1), FAA).

1979 Legislation

The International Security Assistance Act of 1979, PL 96-92, amended the Arms Export Control Act by adding a new Section 27, entitled "North Atlantic Treaty Organization Cooperative Projects." Highlights of Section 27 are:

- Definition, for the purposes of the AECA only, of "cooperative projects" are those projects in which either: (1) the North Atlantic Organization, or one or more member countries thereof, agrees to share with the United States the costs of research on and development, testing, and evaluation of certain defense articles, and the costs of any agreed joint production ensuing therefrom, in order to further the objectives of standardization and interoperability of the armed forces of North Atlantic Treaty Organization member countries; or (2) the North Atlantic Treaty Organization, or one or more member countries thereof other than the United States, agrees to bear the costs of research on and development, testing, and evaluation of certain defense articles (or categories of defense articles) and to have such articles produced for sale to, and licensed for production within, other participant member countries including the United States; and the United States agrees to bear the costs of research on and development, testing, and evaluation of other defense articles (or categories of defense articles), and to have such defense articles produced for sale to, and licensed for production within, other participant member countries, in order to further the objectives of rationalization of the industrial and technological resources within the North Atlantic Treaty area.

- Allows reduction or waiver of certain charges by the President for cooperative projects, only if he determines the participating countries reciprocate by waiving comparable charges.

- Requires a 30-day advance notification to Congress prior to signing an agreement for a cooperative project.

1980 Legislation

Even more recently passed, the International Security and Development Act of 1980 (PL 96-533) contains further amendments to certain provisions of the Foreign Assistance Act of 1961, the Arms Export Control Act

(AECA) of 1976 and the Export Administration Act of 1979, as well as new provisions, of concern to NATO:

Commercial Arms Sales

- Amends Section 36(c), AECA, to provide for a concurrent resolution "legislative veto" during the 30 calendar day notification period of commercially licensed sales valued at $7 million or more for major defense equipment or $25 million or more for defense articles and services. However, NATO and its member countries, Australia, Japan and New Zealand are exempt from the "legislative veto" provision.

- Amends Section 6(i) of the Export Administration Act of 1979 to include the Senate Foreign Relations Committee among the Congressional committees receiving prior notification of certain commercial exports to countries supporting international terrorism.

- Adds a new chapter (Section 29) to the AECA authorizing the President to make sales of "design and construction services" (previously sold as "defense services") and to procure such services for sale to eligible foreign countries. Also, provides for Congressional notification and possible "legislative veto" of such sales of $200 million or more (i.e., amends Section 36(b)(1), AECA, in this regard).

Leasing of Defense Property

- Section 109 of PL 96-533 requires a 30-day notification to Congress prior to any leasing of defense property (involving major defense equipment valued at $7 million or more, or any other property valued at $25 million or more) for more than six months to a foreign government. Also, this section requires a quarterly report of leases for six months or more valued at $1 million or more.

- The Conference Report noted that it is the intent of the Conference Committee conferees that the Executive Branch not enter into leases of defense property for less than six-month periods, or divide such leases, to avoid reporting to the Congress. Further, it is the conferees' intent that the Executive Branch consult with the Congress prior to entering into any lease which could be considered controversial, or which could be considered politically or militarily significant in terms of its impact on a nation or a region of the world.

GATT Legislation

A related form of legislation, bearing primarily on international sales, is the Trade Agreement Act of 1979, which became effective on January 1, 1981. This Act carries out the provisions of the General Agreement on Tariffs and Trade (GATT), which has been under negotiation for over 15 years. *Chapter 7 of this guide, Contract Management, contains a section describing*

the Agreement on Government Procurement, which is the most pertinent agreement to this guide, among the 14 contained in the overall GATT structure.

NEGOTIATING AUTHORITY FOR INTERNATIONAL AGREEMENTS

Negotiation of international agreements is a highly-structured process within DoD. This section discusses important elements dealing with the authority to undertake such negotiations.

Authority to Negotiate MOUs

Within DoD negotiators require the delegation of authority to conduct negotiations and to conclude international agreements. The responsibilities for approval of authority to conduct negotiations and conclude agreements, unless already authorized in DODI 2050.1, are assigned to:

1. The Assistant Secretary of Defense for International Security Affairs (ASD(ISA)) for all categories of international agreements other than intelligence contracts and arrangements, and

2. The Deputy Under Secretary of Defense for Policy (DUSDP) for all intelligence contracts and arrangements.

The Under Secretary of Defense for Policy (USDP) is responsible for maintaining supervision over such negotiations. The ASD(ISA) and DUSDP are authorized to delegate to heads of DoD components the authority to conduct and conclude negotiations in certain categories. This delegation of authority is set forth in DoD Instruction 2050.1, sponsored by ASD(ISA), and Service regulations: ARs 550-51 and 70-41 for the Army, SECNAV Instruction 5710.25 for the Navy, and AFR 11-21 for the Air Force. Excluded are requests for authority to negotiate and conclude agreements of significant politico-military importance; this authority remains vested in ASD(ISA). However, it should be noted that prior consultation with the State Department is a requirement of the Case Act.

Delegation of Authority

Note that technical, operational, and working agreements that implement treaties or executive agreements can be negotiated and approved routinely by:

1. The Secretaries of the Army, Navy, and Air Force.

2. The Chairman of the Joint Chiefs of Staff (JCS)(For agreements concerning the operational command of joint forces).

3. The Director, National Security Agency (NSA)(For agreements pertaining to communications security development).

4. The Director, Defense Security Assistance Agency (DSAA).

Cooperative or reciprocal military support, including arrangements for shared use or licensing of military equipment, facilities, services, and nonphysical resources can be negotiated similarly.

Cooperative research and development, data exchange, and related licensed production and standardization agreements are more tightly controlled. Only the USDRE has unrestricted authority to negotiate agreements in these areas. The Military Secretaries have blanket negotiating authority only in the fields of health and medical agreements. The ASD, Command, Control, and Communications (C^3) is limited to negotiations in the C^3 field only. Intelligence contracts and arrangements are under the cognizance of the DUSDP. (DoDD 5530.3)

Agreements concerning combined military planning, exercises and operations, and exchange of military information or data are generally left to the Military Secretaries for uni-service matters and the Chairman of the JCS for combined matters.

Written permission is required for DoD personnel to participate in negotiations and to conclude those negotiations. Detailed guidelines concerning the limits of their negotiating freedom should be requested; the limits should not be exceeded. The authorization to sign or conclude an agreement may be withheld until the draft document can be examined at the department level. Characteristically, MOU negotiations often last more than a year. Informal discussions are often very useful preliminary to the formal negotiations. These discussions can be started by a data exchange agreement (DEA), licensing agreements, NATO Standardization Agreement (STANAG), etc.

Requesting Authority to Negotiate

Within DoD, requests for authority to conduct international negotiations are addressed to the ASD(ISA) except for intelligence contracts and arrangements which are addressed to the DUSDP. The request may ask for permission to negotiate and/or conclude an agreement or it may ask that a chief negotiator be designated. Assistance or augmentation may be requested from other components within DoD. Finally, the originator may request that OSD or some other agency conduct the negotiations. A draft text or outline of the draft agreement should be appended to the request. If, for any reason, no draft is available, its unavailability must be explained. Legal authorities and all appropriate reference documents should be described. Any fiscal implications must be described as well as the source of funding. The concurrence of the General Counsel of DoD must be obtained before authority can be granted. Because of the legal implications of the MOU, legal counsel should be involved in the review of the MOU at all levels of staffing.

Redelegation of Negotiating Authority

DoD Directive 5530.3, "International Agreements," requires the USDP to oversee the entire international negotiating process. As we have seen, ASD(ISA) has very broad authority including that of delegating authority to DoD components. DUSDP has similar authority in intelligence matters. Both coordinate with the Department of State and, when appropriate, with National Security Council, as do the DoD components having any delegated authority to negotiate. DoD Instruction 2050.1 redelegates approval authority to negotiate and conclude international agreements as shown below in Figure 2-3.

FIGURE 2-3. DELEGATED APPROVAL AUTHORITY TO NEGOTIATE AND CONCLUDE INTERNATIONAL AGREEMENTS

	SECRETARIES OF THE ARMY NAVY AND AIR FORCE	CHAIRMAN, JOINT CHIEFS OF STAFF	1 UNDER SECRETARY OF DEFENSE RESEARCH AND ENGINEERING	2 ASSISTANT SECRETARY OF DEFENSE COMMUNICATIONS CONTROL AND INTELLIGENCE C3I	3 ASSISTANT SECRETARY OF DEFENSE MANPOWER RESERVE AFFAIRS AND LOGISTICS IMPASL	4 ASSISTANT SECRETARY OF DEFENSE	5 DEFENSE COMPTROLLER	6 DIRECTOR NATIONAL SECURITY AGENCY	7 DIRECTOR DEFENSE SECURITY ASSISTANCE AGENCY	8 DIRECTOR DEFENSE MAPPING AGENCY	9
1 TECHNICAL, OPERATIONAL, WORKING, OR SIMILAR AGREEMENTS OR ARRANGEMENTS, CONCLUDED PURSUANT TO A TREATY OR EXECUTIVE AGREEMENT THAT ENTAILS IMPLEMENTING ARRANGEMENTS	✓	✓					✓	✓			
2 AGREEMENTS WITH ALLIED AND FRIENDLY COUNTRIES AND ORGANIZATIONS FOR COOPERATIVE OR RECIPROCAL OPERATIONAL, LOGISTICAL, OR OTHER MILITARY SUPPORT, INCLUDING ARRANGEMENTS FOR SHARED USE OF LICENSING OF MILITARY EQUIPMENT, FACILITIES, SERVICES AND NONPHYSICAL RESOURCES	✓	A			B		✓				
3 AGREEMENTS RELATING TO COMBINED MILITARY PLANNING, COMMAND RELATIONSHIPS, MILITARY EXERCISES AND OPERATIONS, MINOR AND EMERGENCY FORCE DEPLOYMENT, AND EXCHANGE PROGRAMS	C	B									
4 AGREEMENTS FOR THE COLLECTION OR EXCHANGE OF MILITARY INFORMATION AND DATA	✓								D		
5 COOPERATIVE RESEARCH, DEVELOPMENT, DATA EXCHANGE, AND RELATED LICENSED PRODUCTION AND STANDARDIZATION AGREEMENTS	✓		✓								
6 MILITARY AND INDUSTRIAL SECURITY AGREEMENTS UNDER THE PROVISIONS OF V A 4 b DoD DIRECTIVE 5230 11 AND AGREEMENTS RELATING TO MILITARY BANKING FACILITIES AND CREDIT UNIONS						✓					

NOTES
A OPERATIONAL COMMAND OF JOINT FORCES
B UNLESS UNI SERVICE MATTER
C UNI SERVICE
D RELATING TO MAPPING, CHARTING, GEODESY & AERIAL PHOTOGRAPHY

Central Repositories

Central Repositories have been established so that an office of record exists for all international agreements in all categories. The USDRE maintains the repository for data exchanges and the intellectual property transfers. The Department of Defense General Counsel maintains the Central Repository for all other agreements; DoD components funnel the completed agreements to USDRE or the General Counsel directly. In addition, the Assistant Legal Advisor for Treaty Affairs in the State Department must be provided copies within 20 days in order to analyze and forward the agreement to the Congress within 60 days of its having been signed, as required by the Case Act.

3. NATO RSI PLANNING SYSTEMS

INTRODUCTION

The purpose of this chapter is to explain and clarify further the ongoing efforts within NATO to effect improved armaments cooperation between nations by fostering an early and continuing exchange of developmental information. In the previous chapter we discussed the triad approach being used in NATO to facilitate the growth of RSI: establishment of general and reciprocal Memoranda of Understanding (MOUs) with member NATO nations, negotiation of dual production of developed or nearly developed systems, and creation of families of weapons (system packages) for systems not yet developed. Planning systems of the type described in this chapter are essential prerequisites to identifying national and NATO weapons needs that can then be represented in programs governed by the triad of approaches. Thus, the subjects of these two chapters form an interlocking process in the efforts directed at achieving greater RSI.

NATO EFFORTS ON PLANNING

Since the mid 1960s, the real burden of achieving weapons standardization and interoperability has shifted to the civil authorities and institutions within NATO. This shift recognized that achieving cooperation in development, common selection and procurement is fundamentally a political and economic problem more than a military problem. A fresh start was begun in May 1966 when the North Atlantic Council (NAC) approved the report of an exploratory group set up to study the problem of standardization and to propose new solutions. The principal institutional device to emerge from the ensuing reorganization was the Conference of National Armaments Directors (CNAD), which consolidated and replaced the earlier Defense Production Committee, the Armaments Committee, and the Committee of Defense Research Directors. Besides focusing standardization efforts in the civil structure of NATO and consolidating its committees, this shift also recognized that the implied mandatory approach of the NBMRs[1] could not work, and that what was required was a flexible, clearly voluntary system of exchanging information on national R&D and procurement programs and encouraging cooperation among any two or more NATO members in meeting their national requirements. A unique device of non-official civilians was also created in 1968 to facilitate information exchange and voluntary cooperation on a broader basis encompassing defense industries in the member countries. This is the NATO Industrial Advisory Group (NIAG). Besides providing a forum for exchange of information and encouraging industrial cooperation, the NIAG has been used to perform prefeasibility studies in various critical areas of armaments.

In 1971, the work of the CNAD and its subgroups was given sharper focus and redirected to concentrate on the most pressing needs for the Alliance as a whole. Budgetary and economic problems in all NATO countries gave a new urgency to achieving more efficient uses of resources in the high priority,

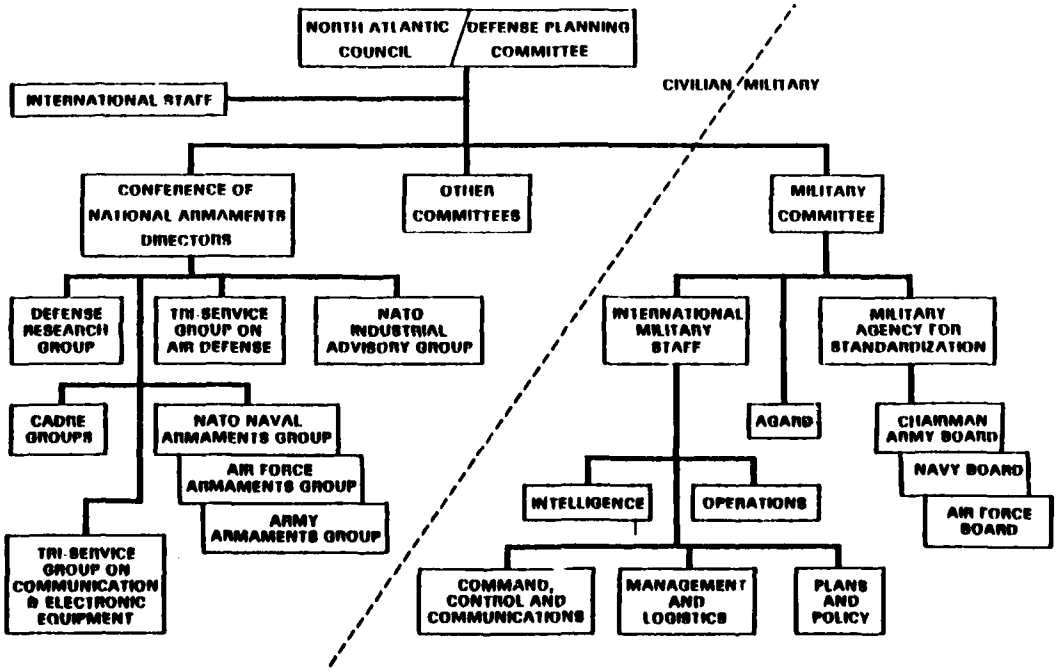
[1] NATO Basic Military Requirements (NBMRs) was a system used early in NATO history by which the NATO Military Authorities attempted to specify common or standard requirements for all NATO forces. This system proved cumbersome, rigid, and ineffective, and was abandoned in the mid 1960s.

high cost areas of new weapons requirements through standardization. Moreover, the CNAD began to work much more closely with the Military Authorities in identifying the most critical areas for interoperability. In addition, by the beginning of 1976, NATO had created nine special agencies (three of which no longer exist because they have completed their work) to manage integrated programs in weapons and logistics standardization. There were also twenty Steering Committees for approved NATO coproduction projects.

After the U.S. initiatives in mid 1975 for NATO to develop new and stronger commitments, policies, and procedures for achieving standardization, the NAC in Ministerial session in December 1975 created an Ad Hoc Committee on Equipment Interoperability to seek to develop practical steps in this priority area and implicitly tabled immediate new action on standardization, pending further development of intra-European and U.S. interests and trends.

Figure 3-1 depicts the principal NATO standing groups and agencies dealing with RSI in general and standardization in particular. A principal formal output of such groups and agencies is NATO Standardization Agreements (STANAGs). Besides STANAGs, however, and probably more important for the degrees of rationalization, standardization and interoperability that have been achieved among groups of states within NATO are the exchanges of planning and requirements information that are generated in these groups and agencies and, informally, through contacts made by participation within them. Such groups and agencies also help to coordinate priorities Alliance-wide and to issue various forms of guidance to participants for greater cooperation in research, development and acquisition of materiel.

FIGURE 3-1. ORGANIZATION FOR STANDARDIZATION WITHIN NATO



Much of the current emphasis on NATO equipment planning has resulted from action by the NATO Military Committee (MC) in 1975. Military Committee Memorandum (MCM) 79-75 recommended that a defense equipment cycle be considered for the Alliance; that recommendation was reinforced in discussions held by the National Armaments Directors' Representatives (NADREPs) in 1976 and their subsequent recommendations to the Conference of National Armaments Directors (CNAD). In the fall of 1976, the CNAD established an Ad Hoc Study Group to examine a possible Periodic Armaments Planning System (PAPS) for use by NATO. The basic concern of all groups was that national equipment programs were not sufficiently responsive to the needs of NATO forces, especially in the areas of standardization and interoperability of weapons.

The concerns expressed in MCM-79-75 are worth reviewing. First, the MC felt there was a definite need to increase the NATO Military Authorities' (NMAs') contributions to the planning process. Second, a cyclical method of work was seen as being desirable. Third, MCM-79-75 stated that special attention was necessary to define the interface between equipment planning and force planning. Fourth, time scales of planning were felt to be too short. Fifth, full Alliance participation was desired. These concerns became the genesis of the program of work for the Ad Hoc Study Group, whose efforts have resulted in two programs - the NATO Armaments Planning Review (NAPR) and the Periodic Armaments Planning System (PAPS). The next two sections discuss these two programs, and also consider briefly their relationship, particularly that of PAPS, to the U.S. Defense Systems Acquisition Review Council (DSARC) process, which is the U.S. counterpart acquisition management process. The final section discusses the mechanisms and requirements for consideration of RSI in DSARC.

THE NATO ARMAMENTS PLANNING REVIEW (NAPR)

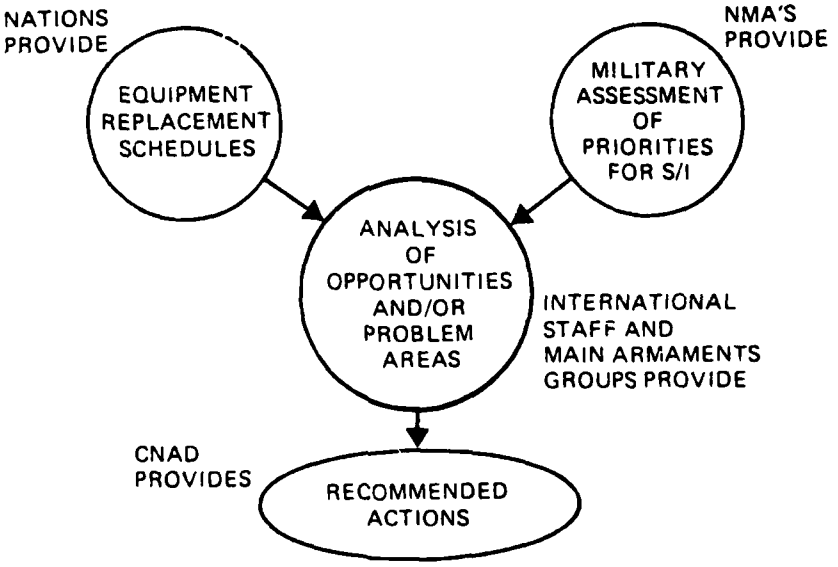
The NAPR has been designed to provide NATO's National Armaments Directors (NADs), and ultimately the North Atlantic Council, with a systematic, cyclical review process through which attention can be focused on the most important and promising opportunities to achieve standardization and interoperability of NATO's future defense equipment. These opportunities are revealed by detailed analysis of nations' annual plans for equipment acquisition, and comparing them against the priorities for achieving standardization/interoperability of these equipments as determined by the Military Committee in its bi-annual review of these plans. The four basic stages in this cyclical review of armaments planning are as follows:

(a) Inputs
  (i) National
  (ii) NATO Military
(b) Equipment Item Selection
(c) Equipment Item Analysis
(d) Outputs
  (i) Reports to CNAD
  (ii) Reports to Council
  (iii) Instructions from CNAD and Council

The stages (a)(i) and (b) are completed each year; stage (a)(ii) is completed once for each equipment item and updated as required, with a review for currency of information not later than every two years for each item of equipment; stage (c) is completed as soon as possible but not later than two years following stage (b); stage (d) is dependent upon action under stage (c) and is completed within six months following completion of stage (c). The CNAD continuously monitors progress of the work.

In essence, the NAPR consists of an annual input from Nations of their plans to replace currently deployed equipment. A second input is an assessment by the NMAs of their priorities for standardization/interoperability (S/I) in key categories of equipment (mission areas). The European input is provided though the Independent European Programme Group (IEPG), with U.S. and Canadian inputs provided separately. The replacement schedules and NMA inputs are provided to the International Staff and CNAD Main Armament Groups[2] to be reviewed for opportunities for cooperation not previously exploited. This review can also identify areas where nations are diverging from standardization or interoperability as a result of independent national decisions. The conclusions and recommendations drawn from this review are then presented to the CNAD for action. A simplified diagram of this process is given in Figure 3-2.

FIGURE 3-2. NATO ARMAMENTS PLANNING REVIEW (NAPR) SYSTEM



[2]NATO Army Armaments Group (NAAG)
NATO Navy Armaments Group (NNAG)
NATO Air Force Armaments Group (NAFAG)
Tri-Service Group on Communications and Electr Equipment (TSGCEE)
Tri-Service Group on Air Defense (TSGAD)

At the fall 1977 meeting the CNAD directed that a trial be conducted using a few equipment categories to determine the utility of these procedures. The trial was successful, and the CNAD directed implementation of the system in October, 1979. With these procedures, NATO planners can gain better insight into national equipment replacement plans - a process which has been random in the past, at best, and national perspectives should be better represented in NATO decisions.

Two other benefits should accrue: first, the NMA's judgments on priorities will be available for consideration earlier in the CNAD decision process, thus having more effective impact on equipment decisions. In many cases in the past, collaborative projects have suffered because the NMA's military judgment has not been available until late in the decision process. A second benefit is that NAPR elevates progress, or lack of progress, towards standardization/interoperability to high-level national authorities (NADs) who can take appropriate action, both nationally and within NATO.

At the present, it would be difficult for the PM to gain access to the NAPR schedule. However, copies of NAPR are in the hands of the Service staffs at the Pentagon. The PM could ask these Service offices for the appropriate sections of the NAPR to be distributed. Whenever NAPR and other relevant information are put into a central information system, it will be much easier to provide the PM with just those sections that he wants.

THE PERIODIC ARMAMENTS PLANNING SYSTEM (PAPS)

One limitation of NAPR is that the data presented represent a rather mature stage of national planning. When national equipment replacement schedules are firm, it is difficult to accommodate program changes brought about via attempts to collaborate. In seeking earlier communication on national programs and plans, two problems were encountered: a lack of early visibility into national military requirements and of NATO review before a national commitment was made, and incomplete information on national plans and a lack of discipline in the reporting process for collaborative programs. Since NAPR partially addresses the second problem area, the Ad Hoc Study Group focused on developing a solution to the first problem, that of encouraging early discussions of military requirements. The proposed solution is the Periodic Armaments Planning System (PAPS).

In arriving at an approach to PAPS, the first task was to reach agreement on what is meant by "early." This was achieved by defining the phases of a weapon system's life cycle and the activities embodied within those phases. The PAPS is divided into seven phases and eight milestones. These are shown in Figure 3-3. These PAPS phases and milestones are shown in Figure 3-4 with reference to the DSARC process. We should mention that the DSARC process is undergoing review in the DoD and changes can be expected in the structure of the DSARC milestones. Such changes will soon be reflected in revised DoD Directives 5000.1 and 5000.2. Pending publication of these revised documents, we have retained the current DSARC structure in this guide. Future issues of the guide will reflect such changes.

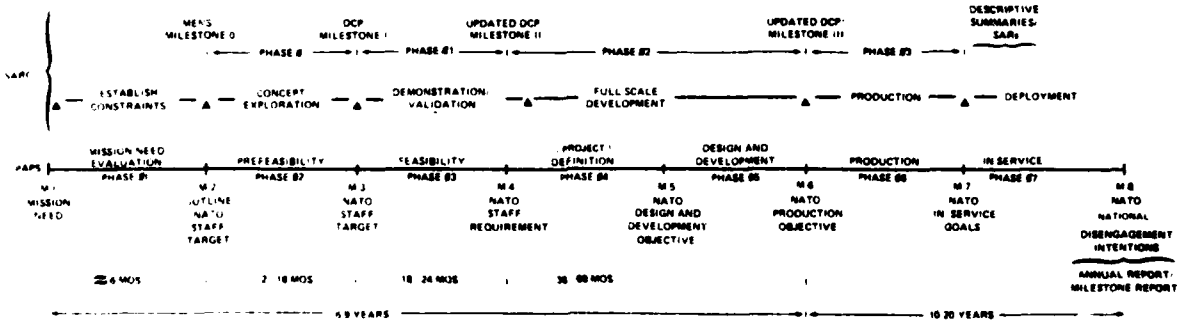
FIGURE 3-3. PAPS MILESTONES AND PHASES

Milestone 1	Mission Need Document (MND)[1]
Phase 1	Mission Need Evaluation
Milestone 2	Outline NATO Staff Target (ONST)
Phase 2	Prefeasibility
Milestone 3	NATO Staff Target (NST)
Phase 3	Feasibility
Milestone 4	NATO Staff Requirement (NSR)
Phase 4	[Project] Definition[2]
Milestone 5	NATO Design and Development Objective (NADDO)
Phase 5	Design and Development
Milestone 6	NATO Production Objective (NAPO)
Phase 6	Production
Milestone 7	NATO In-Service Goals (NISEG)
Phase 7	In-Service
Milestone 8	NATO [National] Disengagement Intention (NADI)[2]

[1]Mission Need Documents resulting from long range planning/mission analysis are prepared by nations and Mission Need Committees. Procedures for the development and processing of MNDs by the NATO Military Authorities are set out in MC 289(Final) dated February 3, 1981.

[2]Square brackets are used at Phase 4 and Milestone 8 to reflect preferences of several nations to have these words appended to clarify meaning.

FIGURE 3-4. PAPS/DSARC STRUCTURES AND THEIR RELATIONSHIP



There is a great deal of similarity between PAPS and the DSARC process, but two differences are worth noting. First, PAPS defines the start of the weapon system life cycle as the point when military authorities forward the mission need. This is somewhat earlier than DoD which defines the start as the point when approval of the need is obtained from the Secretary of Defense. PAPS also recommends attention be given to the in-service and disengagement phases at the mature stages of the weapons system life cycle, whereas DSARC visibility terminates at the production decision.

PAPS is based upon two general principles:

- Recognition of the sovereignty of the nations in equipment decisions.

- Utilization of the basic NATO structure without radical change, while providing clear roles, relationships, and tasks in the formal process.

The challenge to PAPS therefore becomes that of guiding the early considerations of the allies toward cooperation and development of a feedback loop throughout the life cycle. The following is a description of the steps involved in the different PAPS phases. It should be noted that this description of the PAPS phases follows the course of the normal project. The process is flexible enough to permit skipping steps whenever it makes sense to do so. However, the formalization of the process ensures that skipping steps will be a conscious, well-thought-out move, not one that is random or accidental.

Preceding the PAPS phases, we have the normal, long term planning process, mission analysis, etc., which we identify as Long-Range Forecasting. It is a continuously performed function, broader than individual weapon systems. Long-Range Forecasting represents an assessment of the "state of the world," including technological, economical, social, and political factors. The East-West military balance is established which affects various aspects of planning. Mission analysis of the current and future military balance is continuously assessed by the NMAs. This includes threat projections and analysis, development of Warsaw Pact tactical doctrine and concepts, assessment of equipment capabilities vis-a-vis the threat, and scenario development.

These trends are studied for important implications and are continuously incorporated into the capability of the Alliance to affect the threat through NATO doctrine, tactics, force levels, logistics, weapons acquisition, and identification of other possible deficiencies in the forces. Harmonization of the NATO perceived threat, doctrine, and concepts is especially important in the development of mission analysis, because this provides the basis for the mission need and successive cooperative research and development programs. Long Range Forecasting leads to the Mission Need Evaluation which initiates the PAPS process.

PAPS Phase Descriptions

Phase 01, Mission Need Evaluation, starts with input from the continuous process of mission analysis. Specific operational deficiencies in capabilities are identified, usually in relation to a mission area or tactical sub-concepts. These deficiencies are documented in operational terms as a "mission need" for the basis of this input to Phase 01. This mission need document (MND) is prepared by either the national military staffs or the NMAs. The MND is forwarded for action to the Office of the Assistant Secretary General for Defense Support (ASG/DS), who coordinates the document with the NADs, all NMAs, and other NATO staff and agencies. This coordination invites participation of all interested parties in seeking a NATO solution to the mission need. Although MNDs are all forwarded to the NADs, national responses may be provided via Main Armament Group (MAG) representatives in the appropriate MAG forum, especially for those MNDs without significant impact.

The MND is ultimately transformed by an ad hoc subgroup or panel of the appropriate MAG into a set of functional system requirements. The functional system requirements, called an Outline NATO Staff Target (ONST), are built on the mission need, and include general financial, technical, and schedule gross estimates so nations can better assess the necessity and desirability of entering into a cooperative development program. The subgroup/panel is established with representation from the interested nations, NMAs, and NATO agencies. The subgroup/panel operates under the aegis of the appropriate main armament group. The subgroup/panel provides the forum for discussions on a NATO response to the mission need and is charged with integrating the technical, financial, and operational matters into the collaborative requirement.

Although all nations may not participate in this or the development phases, they are encouraged to join in the drafting of the Outline Staff Target. This is done in order to harmonize requirements so as to achieve greater acceptance in, and eventually procurement by, these nations. To avoid narrowing the range of alternatives at this stage, the Outline Staff Target must not over-specify characteristics of the required system. Phase 01 ends with submission of the Outline NATO Staff Target to the nations for approval. The ONST is comparable to the Mission Element Needs Statement (MENS) of the U.S. acquisition process.

Phase 02, Prefeasibility, is an analysis of the alternatives for meeting the Outline NATO Staff Target through use of prefeasibility studies of competitive concepts provided by member nations, industry, or as requested and funded by the subgroup. Where funding is needed, Terms of Reference (TOR) and an MOU are also required. A NATO Staff Target (NST) is developed, based upon the evaluation of the prefeasibility studies detailing the capability being sought, and a summary of the most promising candidates. The subgroup, normally composed of members from nations planning to participate, also drafts appropriate follow-on documentation, such as an MOU and Statement of Work (SOW) for Phase 03. Other than minor commitments of resources, participation in the subgroup has been dependent solely on interest. The signing of this MOU, however, begins commitment of ever-increasing amounts of resources, as well as work-sharing arrangements through the production and in-service phases. The group may wish to develop the initial project plan, a plan that could be used as the primary program management instrument integrating the essential technical, political, military, financial, and managerial factors during the subsequent phases of the weapons system life cycle. It is comparable to the Program Management Plan/Acquisition Strategy at DSARC Milestone I.

Phase 03, Feasibility, begins with approval by participating nations of the NST and the signing of the MOU/TOR and approval of the SOW. NATO's role diminishes as the subgroup/panel of Phases 01 and 02 becomes a project group established to direct the follow-on activity and for liaison with non-participating countries, the NMAs, and NATO agencies. With the relationships denoted in the MOU, the participating nations are now responsible for all centralized management of the technical business and logistics aspects of the joint project. NATO, however, must maintain close liaison with the project group. The project group is now responsible for developing a system specification and logistics plan, and evaluating candidate concepts to provide necessary performance capabilities described in the NATO Staff Target. The system specification, logistics plan, and the project group's estimates of

unit production and fly-away costs, life-cycle costs, manpower and training requirements, development and production schedules, and other relevant data become the NATO Staff Requirement. The Staff Requirement represents a major decision document, since the participating countries will now commit to major development resources, and must assess the benefits of acquiring the system and budgeting for it. Coproduction and licensing agreements must be worked out. The NATO International Staff publishes progress reports and monitors the project group. Phase 03 is concluded with approval of the NATO Staff Requirement and signature of the associated MOU by the participating countries. This point in PAPS corresponds to Milestone II of DSARC in the U.S. process.

Phase 04, [Project] Definition, consists of development of design details and subsystem specifications which comprise the system. The project group transitions into a NATO Project Steering Committee to provide periodic reports to the CNAD and through the office of the Assistant Secretary General for Defense Support (ASG/DS) to the nonparticipating countries, the NMAs, and other NATO agencies. These reports should provide sufficient information for force structure; doctrine; and tactical/operational concepts, training and logistics. A joint common configuration management system should be set up early in the project definition stage, to remain under the technical authority of the developing nations until at least completion of the acquisition phase.

Phase 05, Design and Development, consists of design and production engineering and, perhaps, prototype evaluation. Completion of Phase 05 in PAPS corresponds to Milestone III in DSARC.

Phase 06, Production, is the production and deployment phase. The organization and reporting remain the same. Operational data from using units are collected to assess the adequacy and highlight problems in performance, safety, reliability and maintainability, logistics, training, etc.

Phase 07, In-Service, continues the data collection and coordination of Phase 06. At some point, nations will express their intention to retire the system, identifying the specific point in the life cycle when a nation programs replacement of the existing system with a new capability, feeding back to Phase 01.

Current Status

The testing of PAPS has been completed, with the overall objectives of developing a complete PAPS procedure, integrating PAPS with NAPR, establishing the appropriate relationships between NATO and national planning systems, and providing a complete design procedure to the CNAD in 1981. The CNAD has approved the implementation of Milestones 1 through 4, and is expected to endorse the rest of the process in late 1981.

Integration of PAPS and NAPR

Sufficient information is now available on the success of NAPR and the acceptability of PAPS procedures that the CNAD has directed an examination of ways to integrate the two. NAPR will provide the so-called "feedback" on replacement plans and augment other existing reporting procedures within NATO, thus providing the CNAD with sufficient information on major programs, regardless of their state of maturity. In a sense, NAPR is an accounting system reporting on the success of PAPS and the overall arms cooperation effort.

The process of involving the NADs and obtaining their decisions at early milestones has been adopted, and procedures for later milestones are being developed. When completed, NATO will have a method not only for participating in joint cooperative development, but also a method whereby nations who have not participated in the research and development phase of a major program will be able to obtain information to make decisions on entering into coproduction or dual production agreements or simply to procure the weapon. This process occurs today, but on an ad hoc basis and opportunities for coproduction or common procurement are often missed because information is not available or is too late to be of value.

If an integration is completed along these lines, the PAPS process will include three elements:

(1) The receipt and processing of Mission Need Documents from NATO or National Military Authorities with NAD involvement in the initial decision by nations to participate;

(2) A method whereby National Armaments Directors provide the CNAD with national positions on the degree of participation in cooperative activities such as prefeasibility (concept exploration) feasibility (validation) and full-scale development; and

(3) A periodic view of national equipment acquisition plans and assessment of progress made towards enhanced cooperation. This includes the identification of areas where divergence is beginning to occur so that proper action can be taken.

The DSARC/PAPS Interface

Because of similar definitions and procedures, PAPS and the DoD Acquisition Process should complement one another. Under DoDD 5000.1 a Service identifies needs and develops a draft MENS for each of those which may become major programs. The MENS is first coordinated within the Service staffs resulting in a document which represents the Service's position with regard to the mission need. The MENS is then forwarded to the Office of Secretary of Defense (OSD) for comment and finally to the Secretary of Defense for approval.

If a particular need has potential NATO application and may represent a target for cooperation within the Alliance, the USDRE in OSD, acting as the U.S. NAD, could forward the draft MENS to NATO as a Mission Need Document (MND) under PAPS. Specifically, the draft MENS (now an MND) would be sent to the Assistant Secretary General for Defense Support. The MND would be transmitted to other nations for review and a decision on their degree of initial participation. The DoD review of the MENS would proceed as usual, and in parallel a meeting would be called for a Main Group subgroup to take action on the MND.

The results of a U.S. and a NATO review can then be reflected in the final approved MENS providing a sound basis for collaborative R&D from the start. (The MENS would have a NATO equivalent in an Outline NATO Staff Target.) If this process is conducted in parallel, time will not be lost; in fact, it may preclude delays in new starts due to concerns raised regarding

NATO standardization goals in the MENS and specific plans for Concept Exploration (DSARC Phase 0).

As mentioned earlier in this chapter, the DSARC structure is being revised, but in terms of the current DSARC system, the process of approval of the Decision Coordinating Paper (DCP) for Milestones I, II and III in DSARC parallels NAD reviews under PAPS. Activation of the PAPS process could form a part of the normal DCP coordination process prior to a DSARC, thus providing DSARC/PAPS compatibility from the draft MENS to the completion of full-scale development. Appendix B contains a detailed chart describing the life cycle of major system acquisitions under the DSARC process, including NATO considerations. It is contained in the pocket of the back cover to this guide.

PAPS/European Interface

The PAPS structure being developed is compatible with a number of European systems and a concept recently developed within the IEPG. Therefore, the similarities noted between PAPS and DSARC will likely hold for most other nations and the procedures could be widely adopted without major structural changes to national systems.

Concluding Remarks on PAPS and NAPR

Clearly, there is no procurement authority or agency within NATO to insure standardization and interoperability of materiel procured by the NATO countries. RSI is more likely to be accomplished, due to political and economic factors in weapons acquisition, by cooperation among Allies when there are uniquely converging interests, needs, and capabilities to collaborate on development and production. The NATO Long-Term Defense Program, which has lent considerable impetus to the formulation and acceptance of NAPR and PAPS, should make collaboration more readily viable.

U.S. SYSTEM ACQUISITION PLANNING TO PROMOTE RSI

There are a number of planning requirements or recommendations largely contained in the Defense System Acquisition Review Council (DSARC) process that the Services and Program Managers should observe. This section contains extracts from the relevant documents to assist in that effort.

The DSARC Review Process

Under the provisions of DoD Directive 5000.2, Major System Acquisition Process, Services are required to address RSI at each milestone beginning with Milestone I. OSD policy is clearly stated, as well, in DoD Directive 2010.6, Standardization and Interoperability of Weapons Systems and Equipment within NATO. As stated in DoDD 2010.6 and reiterated in DoDD 5000.1 (19 March 1980), Major Systems Acquisition, "equipment procured for the use of personnel of the Armed Forces of the United States stationed in Europe under the terms of the North Atlantic Treaty should be standardized or at least interoperable with equipment of other members of NATO. Accordingly, NATO rationalization, standardization and interoperability (RSI) shall be basic considerations in acquisition of systems having a partial or total application to Europe."

DoDD 5000.2 (19 March 1980) is very specific in its guidance on international programs and NATO RSI. That paragraph specifies:

"12. International Programs: NATO Rationalization, Standardization and Interoperability (RSI). DoD Components shall take action on the following areas and report progress at all milestone reviews.

a. Consider NATO country participation throughout the acquisition process. This includes standardization and interoperability with other NATO weapons and systems.

b. Consider NATO doctrine and NATO member threat assessments. In development of MENS, mission needs of NATO members shall be considered. In general, data that cannot be disseminated to foreign nations shall not be included in MENS.

c. Solicit NATO member contractors for bids and proposals on U.S. systems and components when such an opportunity is not precluded by statute or by the National Disclosure Policy.

d. During the evaluation of alternative system concepts, the DoD Component shall:

(1) Consider all existing and developmental NATO member systems that might address the mission need. Identify any performance, cost, schedule, or support constraints that preclude adoption of a NATO system.

(2) Determine testing requirements for NATO member candidate systems recommended for further development or acquisition.

(3) Determine whether a waiver of "Buy American" restrictions is appropriate, when a Secretary of Defense determination has not been made.

(4) Develop plans for further international cooperation in subsequent phases of the acquisition cycle such as cooperative development, coproduction, subcontracting, and cooperative testing or exchange of test results.

(5) Recommend U.S. position on third-country sales, recoupment of research and development costs or sharing research and development costs, and release of technology.

e. In subsequent phases of the acquisition cycle, DoD Components shall:

(1) Continue to expand and refine plans for international cooperation.

(2) Recommend U.S. position on third-country sales, recoupment of R&D costs or sharing foreign R&D costs, and release of technology.

(3) Develop plans for host nation initial or joint logistics support, if applicable."

DoDD 5000.2 also provides fairly specific guidance on RSI matters to be addressed at the various milestones. For convenience, salient points are synopsized.

Decision Coordinating Paper (DCP) and Integrated Program Summary (IPS)

Both a DCP and IPS will be prepared for each milestone review. The IPS will address international programs, summarizing actions taken in those areas specified in paragraph E.14 of the basic DoDD 5000.2 (see above). Approved, pending, and potential foreign military sales will be identified. The DSARC and Service Systems Acquisition Review Councils will address RSI at Milestones I, II and III.

RSI Plans

Within DoD, there is no formal requirement for the submission of an RSI plan for OSD approval. On occasion, OSD has requested RSI plans be submitted for approval on selected systems. Service acquisition regulations and development command directives vary, however, in this regard. In a letter dated 29 May 1980, Headquarters, U.S. Army Materiel Development and Readiness Command (DARCOM) for example, requires its PMs to prepare and submit an RSI plan for major systems, a requirement not mandated by the governing Army Regulation. The Navy instruction is SECNAV Instruction 5711.10A and for the Air Force, it is AFR 73-3, both stressing attention to RSI considerations.

With the stringent length restrictions mandated for the DCP and IPS, the preparation of an RSI plan, attached as a tab to the DCP/IPS, can serve as a useful mechanism for providing the alternatives and rationales considered. This can provide clarification and amplification for the synopses presented in the DCP/IPS. As well, the preparation of a separate plan helps ensure thorough consideration of available alternatives.

Appendix C contains a draft RSI plan outline prepared for dissemination within the Army. This outline plan is configured around a development project which is still early in the acquisition cycle (i.e., immediately following DSARC Milestone Zero). Managers of projects which have matured beyond this point, perhaps even into production and transition, may as well find this outline useful since it is intended to be flexible enough to reflect varying options driven by program maturity. For example, if coproduction or Foreign Military Sales (FMS) are the only viable RSI alternatives remaining, the plan would be tailored to examine these alternatives and provide an assessment of their RSI value and potential for implementation.

The degree of detail to be furnished in the "out-years" of the plan is also a function of the maturity of the program. In early stages, more in-depth attention ought to be given to investigating mutual requirements, codevelopment possibilities, and the analysis of applicable allied/U.S.

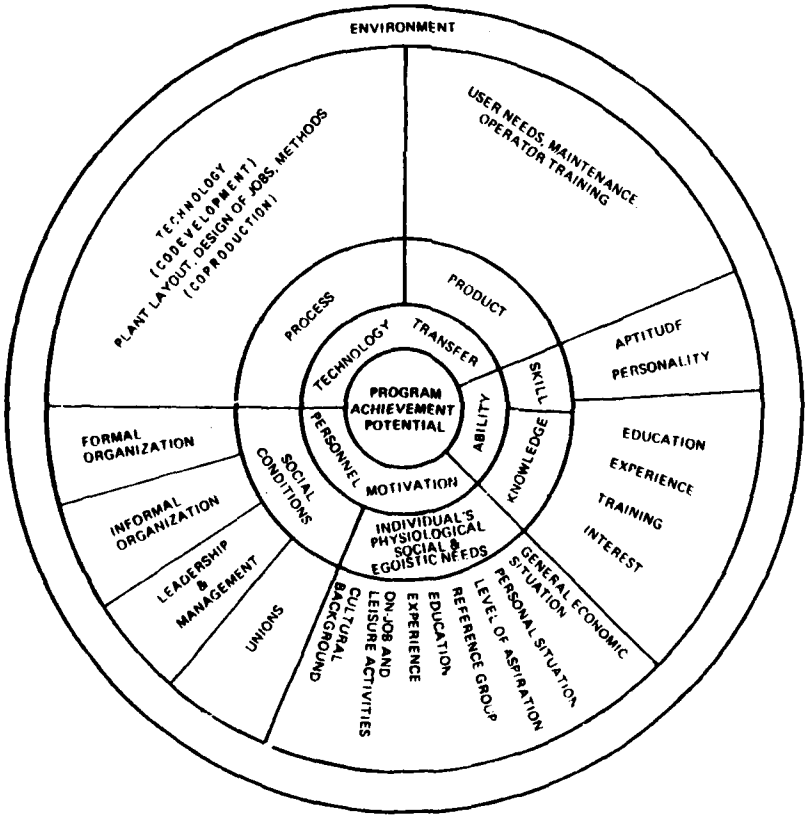
technology. As the program matures, additional interactions of the plan would flesh out details of production, deployment, third country sales, configuration control, production improvement, et al. It is intended that the RSI plan be a living document and be action oriented. It should provide an accurate and current blueprint for pursuing all viable RSI initiatives commensurate with the stage of program development.

4. EUROPEAN OVERVIEW

DEFINITION OF THE ENVIRONMENTAL DIFFERENCES

If you have been selected in either Government or industry as a manager of an international project in defense acquisition, you have been assigned to a position with great challenge and opportunity, but also one involving many difficulties. The task of international transfer of technology and mutual defense support takes on added dimensions over national projects because of the differences in the structures and objectives of the participating countries and their businesses. As program manager, your responsibility is to define the system specifications from the requirements, devise the acquisition strategy and the process for technology transfer, and control development and production through contracts with industry. There are many factors in the multinational environment, however, which must be understood. The critical elements in achieving program objectives are diagrammed in Figure 4-1.[1]

FIGURE 4-1. CRITICAL ELEMENTS OF THE INTERNATIONAL PROGRAM MANAGEMENT PROCESS



[1]This figure is taken from Fargher, J., "Communication in Multinational Projects," Proceedings From Project Management Institute 1980 Symposium/ Seminar, Oct. 27-29, p. 19.

Factors which are comparable for a national as for an international project are: 1) military requirement based on the perceived threat, doctrine and tactics; 2) resources (capital, personnel & technology) and 3) industrial base to support the program. The program manager can only attempt to influence these factors by constant contact with the users or user representatives, and to obtain large benefits through careful planning and management. The acquisition strategy, as discussed in Chapter 5, is the key planning prerequisite.

Also important to the program manager is the non-measurable environment of international operations: culture, attitudes, human behavior, national priorities and other factors which represent differences among the countries involved. The goal to be emphasized for multinational management is measurement of organizational performance. A specification of critical elements for each participating nation and company is required to identify the differences in national and business objectives. These differences represent the environment of the international program manager. Program achievement is determined not only by how effectively and efficiently people work. Technical factors play an important role, sometimes overwhelmingly. The plant, product, product mix, plant and job layout, design of machines and equipment, degree of integration (batch vs. continuous) of production processes, raw materials, research and development management, and scientific and engineering management are all factors in the process technology transfer. User needs, maintenance requirements, and operator training are factors in product technology transfer. Technology transfer and modification of the formal organization to effect technology transfer are accomplished by training programs.

On the personnel side, employee motivation and ability are also essential to program achievement. Employees here include executives and managers, the program manager and his staff, and white and blue-collar workers of the participating countries' governments and businesses. Ability is derived from knowledge and skill. Knowledge and skill are derived from aptitude, personality, education, experience, training and interests. Motivation results from a combination of various social forces such as the formal and informal organization, leadership and management, and labor unions. The individual's motivation is also affected by psychological, social, and egoistic needs. Recognizing that all of these factors differ by country, as much in Europe, as between Europe and the United States, detailed knowledge of a country is important in program management. A good reference on this subject is Peter Drucker's book "Management," originally published in 1971. His book relates how management operates in the U.S., Europe and Japan.

Several other factors are discussed in this chapter: competition, defense industry practices, education, taxes and personnel practices. The Europe discussed in this chapter is a generalized model and not a specific reality.[2] It is not quite France but also not quite Germany, Belgium or Italy. In addition to providing general information on these important factors from an overall European standpoint, it seems useful to provide summary statistics and other data on the individual European NATO countries.

[2]The material for this chapter is derived from a copyrighted paper prepared by Franz Frisch titled "European Overview," and submitted for publication to Concepts, Defense Systems Management College.

This information, which covers their political, geographic, social/demographic, economic, and military features is presented in Figure 4-2, along with descriptions of principal European organizations important to NATO.

LESS COMPETITION IN EUROPE

Differences do exist between the U.S. and European countries with respect to competition in defense acquisition. These differences, characterized by less competition in Europe, pose a major problem in transatlantic NATO/RSI acquisition. The influential factors are both historical and structural. The historical factors, which have become much less important in recent years, relate to the ancient system of guilds with its restrictions on entry into different trades and professions, as well as its control over practices. This trade pattern has changed markedly as large industries and companies have developed, with the major industrial unions displacing the earlier trade organizations as important centers of labor and trade influence.

The structural factors are much more significant in producing less competition in Europe compared with the U.S. The two most important factors, which are closely linked together, are:

1. Size of Market vs. National Budget

The defense forces of the larger European countries are as varied in defense systems as the U.S. However the production numbers of such systems in these countries are substantially smaller. Other European countries, being smaller, have a lesser variety of defense systems because of limited access to export markets which makes production of many types of systems impractical as well as economically infeasible.

2. Number of Companies

The economic situation, primarily based on the size of the market, has substantially limited the number of companies in the defense industry. A strong movement towards mergers heavily imposed by the European governments on their industries, has reduced the number of companies even more during the past few years, so that in some European countries only one or two companies exist nowadays in certain segments of defense product.

Although both factors, the reduced market and the small number of potential bidders, tend to restrict competition, many European programs were, and are, based on competitive source selection, including weapon systems from the U.S. in such competitions. The selection of the F-104, F-4, and F-16 from the U.S. are cases in point. A related issue is the difference between the U.S. and Europe in the selection criteria used in the source selection process. It is generally true that the European source selection process is less formalized, e.g. the proposal effort required from industry is smaller and the selection process used in Europe is much less detailed.

FIGURE 4-2. KEY NATO BACKGROUND FACTS

	FRANCE	GERMANY	UNITED KINGDOM
POLITICAL			
Form of Government	Fifth Republic under a President	Parliamentary Democracy	Constitutional Monarchy
Branches of Government	Executive, Legislative & Judicial	Executive, Legislative & Judicial	Executive, Legislative & Judicial
Parliamentary Composition	Coalition	Coalition	Three-Party System
GEOGRAPHY			
Area	211,000 square miles	98,815 square miles	94,209 square miles
Natural Resources	Iron, bauxite, coal, asphalt, rock salt, potash, & forests	coal, lignite, iron, zinc, lead, copper, salt, potash, & oil	oil, gas, coal, limestone, iron, salt, clay, chalk, gypsum, lead, tin, & silica
SOCIAL/DEMOGRAPHIC			
Population	53.5 million (1979)	61.4 million (1979)	55.9 million (1979)
Composition	Mixture of various European and Mediterranean groups	Germans, immigrant workers from Spain, Italy, Yugoslavia & Turkey	English, Scottish, Irish, Welsh, Ulster, & immigrant workers from West India, Pakistan, & others
Liguistic Groups	French, minorities speak Breton, Alsatian German, Flemish, Italian, Basque & Catalan	German with many dialects	English, Welsh spoken in Western Wales
ECONOMY			
Description	Industrialized with strong military export market. Steel, chemicals, autos, textiles, wine, perfume, aircraft, ships, instruments, plastics & electronic equipment	Heavily industrialized. Steel, ships, oil products, autos, machinery, textiles, electrical & electronic equipment. Heavily dependent on imports of raw materials	Engineering products are the most important industry. Steel, metals, vehicles, chemicals, electronics, aircraft, machinery, scientific instruments, distilling. Dependent on imports of raw materials
GNP	$422.9 billion (1978)	$596.4 billion (1978)	$271.4 billion (1978)
Balance of Trade	Surplus (1977)	Surplus (1977)	Deficit (1977)
Gov't Spending (Surplus or Deficit)	Deficit (1976)	Deficit (1977)	Deficit (1977-9)
Defense Industry	Highly developed airframe, engine & electronics industries	Highly developed heavy & electronics industries	Highly developed heavy & engineered products industries
Membership in International Organizations	NATO (nonmilitary only) EEC, WEU, FINABEL, IEPG	NATO, EEC, Eurogroup, WEU, FINABEL, IEPG	NATO, EEC, Eurogroup, WEU FINABEL, IEPG
MILITARY			
Armed Forces Population	Withdrawn from NATO control	Regulars 724,000 Reserves 1,179,500 About 214,000 U.S.; 55,000 BR; & 50,000 FR troops stationed in GE	Regulars 642,650 Reserves 207,400

	ITALY	BELGIUM	DENMARK
POLITICAL			
Form of Government	Parliamentary Republic	Parliamentary Democracy under a Constitutional Monarch	Constitutional Monarchy
Branches of Government	Executive, Legislative & Judicial	Executive, Legislative, Judicial	Executive, Legislative, Judicial
Parliamentary Composition	Coalition	Coalition	Coalition
GEOGRAPHY			
Area	116,303 square miles	11,800 square miles	16,169 square miles
Natural Resources	gas, marble, sulphur, mercury, & coal	Some coal, few others	Some natural gas and North Sea oil, metals in Greenland
SOCIAL/DEMOGRAPHIC			
Population	56.9 million (1979)	9.8 million (1979)	5.1 million (1979)
Composition	Italians, small minorities of Germans, Slovenes, Albanians, French, Latins, & Greeks		Homogenous Germanic People
Linguistic Groups	Italian	Flemish (Dutch) Speaking 56%; French Speaking 32%; Bilingual 12%	Danish with small German and Eskimo speaking minorities
ECONOMY			
Description	Primarily light industry. Steel, machinery, autos, textiles, shoes, machine tools, chemicals, oil products, typewriters	Heavily industrialized. Very dependent on Exports. Heavy importer of oil. Recent problems in export markets for steel and textiles	Mixed industry and agriculculture. Major industry: production of industrial and construction equipment, electronics, textiles, furniture, agriculture, meat, dairy products, fish
GNP	$214.1 billion (1978)	$88.1 billion (1978)	$49.1 billica (1978)
Balance of Trade	Deficit (1976)	Deficit (1975-78)	Deficit (1974-77)
Gov't Spending (Surplus or Deficit)	Deficit (1977)	Deficit (1975-78)	Deficit (1974-77)
Defense Industry	Highly developed airframe, engine & electronic industries, munitioja, tanks & vehicles	Airframe, engine and electronics. Highly developed military small arms industry	Some military electronics
Membership in International Organizations	NATO, EEC, Eurogroup, WEU, FINABEL, IEPG	NATO, EEC, Benelux Economic Union, WEU, Eurogroup, FINABEL, IEPG	NATO, EEC, Nordic Council Eurogroup, IEPG
MILITARY			
Armed Forces Population	Regulars 541,000 Reserves 694,800	85,650	34,700

	THE NETHERLANDS	NORWAY	TURKEY
POLITICAL			
Form of Government	Parliamentary Democracy under a Constitutional Monarch	Hereditary Constitutional Monarchy	Parliamentary Republic
Branches of Government	Executive, Legislative, Judicial	Executive, Legislative, Judicial	Executive, Legislative, Judicial
Parliamentary Composition	Coalition	Coalition	Legislature consists of National Security Council
GEOGRAPHY			
Area	14,103 square miles	150,000 square miles	301,380 square miles
Natural Resources	Some natural gas	North Sea oil, timber, ore, hydroelectric power, fish	Antimony, borate, copper, chrome, molybdenum, magnesite, asbestos
SOCIAL/DEMOGRAPHIC			
Population	14.0 million (1979)	4.1 million (1979)	44.6 million (1979)
Composition	Primarily Germanic People with some Gallo-Celtic mixture	Primarily Germanic with some Finns and Lapps in North	Turks (90%), Greeks, Armenians, Jews, and other non-moslems
Linguistic Groups	Dutch and some Frisian	Norwegian and some Lapp dialects	Turkish
ECONOMY			
Description	Heavily industrialized with advanced agriculture - much on land reclaimed from Sea. Principal products: ship building, metal fabrication textiles, chemicals, electronics, foodstuffs	Industrial activity concentrated in South around Oslo and Bergen. Industrial products iron and steel, ship building, transport equipment, chemicals, electronics	Silk, textiles, steel, shoes, furniture, cement, paper, glassware, appliances, tobacco, petrochemicals, food & automotive
GNP	$112.7 billion (1978)	$37.6 billion (1978)	$53.7 billion (1978)
Balance of Trade	Deficit (1975-77)	Deficit	Deficit (1974-77)
Gov't Spending (Surplus or Deficit)	Deficit	Deficit	Deficit (1975-77)
Defense Industry	Developed airframe industry, electronics	Ship building and electronics	Munitions, overhaul of aircraft and engines, electronic equipment, and vehicles
Membership in International Organizations	NATO, EEC, Benelux economic Union, Eurogroup, WEU, FINABEL, IEPG	NATO, Nordic Council, Eurogroup, IEPG	NATO, Eurogroup, IEPG
MILITARY			
Armed Forces Population	112,000	39,000	Regulars 775,000 Reserves 700,000

	GREECE	CANADA	ICELAND
POLITICAL			
Form of Government	Parliamentary Democracy	Constitutional Monarchy and Federal Parliamentary State	Parliamentary Republic
Branches of Govern-	Executive, Legislative & Judicial	Executive, Legislative & Judicial	Executive, Legislative & Judicial
Parliamentary Composition	Coalition	Coalition	Coalition
GEOGRAPHY			
Area	50,547 square miles	3,851,807 square miles	39,702 square miles
Natural Resources	Bauxite, iron, emery, lignite, oil, silver, manganese, chromite, nickel, & baryte	Oil, natural gas, copper, zinc, iron, lead, gold, uranium, salt, forestry products	Diatomite
SOCIAL/DEMOGRAPHIC			
Population	9.4 million (1979)	23.7 million (1979)	226 thousand (1979)
Composition	Greeks (89.5%), Turks (10.0%), Bulgars (0.3%), Armenians (0.2%)	British (44%), French (30%), native Indian & Eskimo (1%), others (25%)	Homogeneous, descendants of Norwegians, Celts
Linguistic Groups	Greek, others	English & French	Icelandic
ECONOMY			
Description	Manufacturing. Textiles, chemicals, steel, tobacco products, aluminum, consumer products, agriculture, shipping & mining	Autos, petroleum, refining, pulp & paper products, iron & steel, machinery & equipment, smelting & refining. Rich in natural resources	Fish & fish products, aluminum, and manufactured products (metal products, clothing, furniture, fertilizer & cement)
GNP	$30.8 billion (1978)	$217.7 billion (1978)	$2.3 billion (1978)
Balance of Trade	Deficit (1977)	Surplus (1977)	Deficit (1977)
Gov't Spending (Surplus or Deficit)	Deficit (1977)	Deficit (1977)	
Defense Industry	Vehicles, aircraft & engines (overhaul & repair), munitions, electronic equipment	Coproduction of various U.S. systems, part of the U.S. mobilization base	Aluminum manufacturing
Membership in International Organizations	NATO, EEC, Eurogroup, IEPG	NATO	NATO, Nordic Council
MILITARY			
Armed Forces Population	Regulars 348,000 Reserves 310,000	Regulars 80,000 Reserves 19,100	U.S. NATO Air & Naval Forces 2,900 (1975)

	PORTUGAL	LUXEMBOURG	EUROPEAN ORGANIZATIONS
POLITICAL			
Form of Government	Constitutional Government	Constitutional Grand Duchy	Eurogroup is composed of an informal grouping of European members within the framework of NATO for the purpose of closer European cooperation within the Alliance.
Branches of Government	Executive, Legislative & Judicial	Executive, Legislative & Judicial	
Parliamentary Composition			The European Economic Community (EEC), or Common Market, has as its aim the integration of members' economies, coordination of social developments, and ultimately, political unification of the democratic states of Europe.
GEOGRAPHY			
Area	35,340 square miles	999 square miles	
Natural Resources	Coal, copper, tin, kaolin, gold, iron, manganese	Iron	The Western European Union (WEU) consists of the original signatories of the Brussels Treaty of 1948 (Britain, France, and the Benelux countries) plus Italy and the FRG. The WEU has been largely inactive, but it does provide an additional forum and one in which the interests of France are represented.
SOCIAL/DEMOGRAPHIC			
Population	9.8 million (1979)	360 thousand (1979)	
Composition	Homogeneous, with small African minorities	Mixture of French & Germans predominate, Italians (7%)	The Nordic Council is an interparliamentary union to promote cooperation of Scandinavian nations in nonmilitary matters (also includes Finland & Sweden).
Linguistic Groups	Portugese	French, German, Luxembourgish	
ECONOMY			
Description	Textiles, pottery, shipbuilding, oil products, paper, glassware, forestry products & cork	Steel, chemicals, beer, tires, tobacco, metal products, cement	The Benelux Economic Union provides for free trade, tariff-free between the three member countries and coordination of monetary policies. The Benelux countries were founding members of the EEC which eventually is planned to supersede the Benelux union.
GNP	$19.1 billion (1978)	$4.0 billion (1978)	
Gov't Spending (Surplus or Deficit)	Deficit (1973)		FINABEL is a committee of Chiefs of Staff apported by principal military experts from France, Italy, Netherlands, Germany, Belgium, Luxembourg, and the United Kingdom.
Defense Industry	None	None	Independent European Programme Group. Established in February 1976, as a result of decision taken by Eurogroup Ministers to establish a new forum, in which France could participate, for European cooperation in defense procurement. Although it has no formal structure, in practice it meets at several levels: - "Under Secretary of State" meeting annually. - "National Armaments Director" meeting biannually. - Expert panels. The IEPG is committed to promoting European cooperation and standardization in weapons development and procurement.
Membership in International Organizations	NATO Eurogroup IEPG	NATO, EEC, Eurogroup, WEU, FINABEL, IEPG, Benelux Economic Union	
MILITARY			
Armed Forces Population	Regulars 58,000 Para-Military 29,900	Regulars 625 Para-Military 430	

EUROPEAN DEFENSE INDUSTRY PRACTICES

Given the limited possibilities of competition, European defense business policies have been aimed at cooperation and integration of the limited market and technological-industrial base available for R&D and production. For intra-European collaborations, the critical issues for negotiation are: (1) work (or employment) sharing, (2) technology sharing in research and development, and (3) market sharing. Such collaborations are carried out typically only after a common requirement has been identified and sources selected to carry the project from conceptual design to production, with the expectation that commitments will be maintained on the negotiated issues. In some cases, given an adequate scale of production and enough qualified companies, even though one company has developed the system, the production phase has been subjected to a new source selection.

Another major difference between the U.S. and European acquisition system is that in Europe each program does not normally have to be reviewed by the Legislature each year during the Program Planning and Budget cycle as is true in the U.S. (with its jeopardy of program cancellation). This difference in practice normally results in more stability of a project once the program concept and overall funding have been approved by the parliament.

To American industry, the European pattern of governmental-industrial cooperation is a comparatively unfamiliar environment. However, consolidations and international collaborations among European nations and industry have dramatically contributed to overall European defense industrial capability, and probably to marked efficiency and productivity through building on the well-capitalized industries of the principal European partners. Particularly in the high-technology areas, British and French collaboration has led to the Lynx, Gazelle, and Puma helicopters, the Martel Anti-Ship Missile, and the Jaguar ground attack/training jet; French and German collaboration has resulted in the HOT and MILAN antitank weapons, the Kormoran air-to-ship missile, and the Alpha Jet and Roland; and French and Italian collaboration has produced the OTOMAT SS naval missile and air-to-surface Albatross. Many of these systems are clearly competitive with U.S. designs on a systems performance basis. The U.S. advantage seems to be in its ability to manage mass production efficiently.

INDUSTRY AND EDUCATION

The nonuniversity engineer in Europe is the backbone of all industrial enterprise and the trade masters are the souls of the workshops. The education of the nonuniversity engineer takes approximately seven years with 25 hours per week in the classroom and approximately 15 hours per week on the drafting board and in the workshop; the trade master has about 10 hours per week in the classroom and 30 hours on the shop floor. In comparison, the academic engineer, Diplom Ingenieur (in German language) has approximately 35 hours per week classroom education for five years, and in addition (mostly during vacation) an average of 7 hours per week floor training. This mixed method of education enables the engineer from the nonuniversity track to communicate down to the workbench and up to the development laboratory.

The talent distribution in the work force permits the European to set up highly flexible manufacturing programs and to achieve efficient production of

small lots. The American counterpart tends toward large manufacturing units with high specialization, which is different from the European set-up.

TAXATION

Although Europeans have quite a common view toward taxation and in particular toward the definition of profit--their opinion is not codified in a general "European Tax Theory." They do it pragmatically. This pragmatism has evolved from the lessons of WWII, ending with the complete collapse of the European economy. Essentially, the European governments consider private business as a source of employment and hence are willing to support business in various ways: tax incentives, protection and the right to make decisions with a minimum of legislative constraints. In return, the governments expect private industry to pay for a considerable amount of the social benefits, such as social security. Hence, the subjects of profit, social benefits, and job security are intertwined.

Quite frequently, in Europe the government encourages the use of the shortest possible depreciation time to foster a specific segment of the industry. For example, when shipyards were down for lack of orders, and ship operations were booming, certain European governments (Sweden, Norway, and West Germany) induced new ship orders by permitting a reduced depreciation time for ships of 3 years against the more conventional 15 or 20 years.

The usual purpose of the depreciation (allowance) is to offer the opportunity to recoup investment and/or to accumulate sufficient money to replace present equipment with new equipment after some time of use. In the U.S., the investor can only recoup his original capital, while the European can typically accumulate capital based on the replacement cost.

At times, when industrial growth was desired, many European governments declared any profit tax-free so long as that profit was reinvested in the company of origin within the same tax year. This prevented profit emigrating through diversification.

An interesting European concept for influencing the direction and extent of economic growth is the combination of front-end subsidy to industry with back-end taxes on profits and sales. This combination provides the European governments with a simple fiscal control tool by: (1) permitting industry to supply (whatever is considered as) essential goods at low prices in the market; (2) reducing the risk in volume production of the business operation; and (3) permitting policy to determine which industries and/or products should be heavily taxed. Of course, the system presupposes that subsidies for railroads, the postal operation and staple food as well as school and health service, and to a large degree, housing are not considered as unreasonable or undesirable; however Europeans are accustomed to subsidizing these activities as a matter of course.

LABOR STABILITY & COMPENSATION PRACTICES

The obligation to stabilize employment is almost nowhere in Europe a formal legal obligation; it is rather a de facto situation enforced by union contracts pertaining to severance pay, complaint procedures and similar institutionalized actions. Present efforts in the U.S. Congress to introduce job

protection laws in the case of factory closing or relocation bear a vague similarity to the European approach.

Figure 4-3 illustrates some of the general differences in personnel-related practices between the United States and Europe.

FIGURE 4-3. PERSONNEL PRACTICES DIFFERENCES

	UNITED STATES	EUROPE
Wages	Nominal Fringes High Wages and Real Earnings	High Fringes Nominal to High Wages Low to Nominal Real Earnings (Germany is an exception)
Income Taxes	Nominal	Higher
Vacations	Individual Preference	Plant Shutdown
Employment Level	Variable	Level Load
Work Schedules	Flexible	Less Flexible and Slower
Personnel	Technicians- Machine Oriented	Craftsmen- Product Oriented
Tooling	More Automation Less Tools	Less Automation More Tools

Relatively speaking, fringe benefits represent a higher percentage of the total compensation of European manufacturing companies than of U.S. producers. This factor provides a greater motivation for the European worker to remain with a specific company and retain his benefits, compared to the more mobile U.S. worker. From a scheduling standpoint, the U.S. approach of relatively random vacation periods for the workers offers somewhat more flexibility than the tendency in Europe to meet vacation needs of the work force through plant shut-downs. The European labor restrictions on overtime and on extra shifts, and the very low mobility of labor can create scheduling obstacles to integrated multinational programs, although economic factors do override such inhibitions given a large program and a demanding production schedule.

Widespread inhibitions or prohibitions on layoffs of personnel in Europe frustrate savings in production costs. The emphasis on maintaining the employment level in Europe has led many firms to stress continuity of output, rather than intermittent large orders which tend to create employment peaks and valleys. Consequently, the European goal is to maintain the employment level and not necessarily to increase industrial capacity or employment, at least without the strong assurance that such increased employment will be maintained over an extended period. It is this factor that makes the prospect of a surge of large orders from the U.S. less than attractive.

It is of interest that in Germany, compared with private aerospace firms in other parts of Europe, significantly greater use has been made of subcontractors to avoid building manpower levels higher than those which can be sustained when orders begin to fall off. In European nationalized companies, on the other hand, the situation is reversed, with little use made of subcontractors. There is a view within European industry that, until 10 years ago, productivity as measured by output per employee was the main criterion of management in setting labor force levels. However, in the last few years, there has been a shift towards emphasizing employment security. This change is due to public pressure to make sure that defense funds are used to keep European nationals employed. The movement toward nationalized engine and airframe companies in France and Britain appears to be based on similar concerns.

There are also some general differences between U.S. and Europe in the way manufacturing personnel skills are developed. In the U.S., there has been a movement toward developing the shop employee as the technician responsible for the operation of automated or computer controlled equipment. In Europe, the tendency is still to view the manufacturing worker as a craftsman. One result of this European perception is shown in the smaller number of processing instructions on engineering drawings. In many cases, the specifics of the manufacturing are left to the discretion of the worker. In the case of coproduction programs, this difference in practice has caused difficulties irrespective of the direction of technology flow.

Finally, some of the European Economic Community (EEC) nations produce in certain industrial sectors about 50% for export, e.g. motor cars. Hence, export is for many European companies the backbone of their production while with few exceptions, export is only a marginal consideration for most American companies. In addition, economic rules of European production for export are not the same as for indigenous consumption. The goal of the export dependent industry might be to search for productivity resulting in minimum production cost, while for an industry producing primarily for indigenous consumption, the goal might be the combination of maximum employment combined with bearable cost. The Europeans view productivity and hence the capital/labor ratio in production as an interdisciplinary problem, where technology, economy and social factors intermingle.

CONCLUSION

This chapter can only be regarded as a brief overview of the European environment. We have made general remarks about Europe, but the countries there have individual differences which cannot be disregarded by a program manager as he deals with specific governments and companies. In addition, Europe continues to go through rapid industrial and technical change, so that the evaluation presented in this chapter needs to be updated periodically. Therefore, the PM should consider this chapter as a starting point for becoming much more familiar with the complexities and subtleties embedded in European history, culture, politics, economics, and industrial structure and development.

5. ACQUISITION STRATEGY

CONCEPT

If analysis of the RSI alternatives indicates a viable international program is possible, the program manager (PM) may be called upon to prepare an acquisition strategy for the international program. The acquisition strategy is the program manager's plan for achieving the goals of the program, and must consider each and every stage of the acquisition process from concept to deployment. In the NATO program environment, unlike in a domestic U.S. program, the program objectives are usually set forth in the Memorandum of Understanding (MOU) signed by the participating national governments. These objectives then become the basis for the major portions of an acquisition strategy: management of the requirements technical strategy, business and financial strategy, contracting strategy, and integrated logistics support strategy. As in any acquisition strategy, each strategy must be tailored to the specific program. Throughout the program's life, the strategy evolves as the various program aspects and personnel interact with each other to accommodate change and reduce risk. The acquisition strategy can never be regarded as a rigid plan, but must change as conditions change to meet the program goals. In the complex environment of the international program with many complex and sometimes sub-optimizing goals, the acquisition strategy must remain even more flexible. There are also legal restrictions and approvals required for releasability of critical technology and classified military information and agreements required on intellectual property rights. Modes for NATO acquisition strategies are also discussed in detail.

PROGRAM RSI ACQUISITION STRATEGY

Standardization and interoperability are to be pursued on a priority basis to increase the combat effectiveness of the allied military forces and to conserve the scarce research and development resources. Emphasis of these features in the U.S. is placed on command, control, communications, and intelligence systems (C^3I); cross-servicing of aircraft; ammunition and battlefield surveillance; and target designation and acquisition systems. The emphasis also extends to interoperability and standardization of system components, spare parts, and common logistics systems.

The PM should consider the use of competition to obtain the trade-offs between cost, performance, supportability, and schedule to the best advantage of his program where there is a net benefit to the NATO participants.

The RSI Acquisition Strategy (henceforth simply referred to as acquisition plan or AS) should not contain planning details; it is intended to serve as an overall strategy for guiding functional implementation plans. Formulated by the PM with the assistance and advice of acquisition, contracts, international, and other functional specialists, the plan is coordinated with the appropriate materiel development commands (DARCOM, AFSC, AFLC, NAVMAT) and OSD(USDRE(IPT), USDRE(AP)IA, ASD(ISA)).

The AS includes a discussion of operations and alternative systems of NATO origin, strategy for acquisition and logistics support of the system, a

technology release plan, organization of the management group, test and evaluation plan for foreign systems, and the extent of NATO involvement. The types of U.S. participation with NATO countries range from U.S.-produced/ European-purchased via Foreign Military Sales, to joint U.S./European production with different assembly points, to limited European or U.S. licensing agreements for components, and to fully European-produced systems for purchase by the United States.

The AS defines the interrelationships among the participating countries' management, technical, business, resource, military force structure, support, testing, and the other aspects of the program. It must also address typical management issues ranging from codevelopment to co- and dual production, assess the impact of different levels of funding, and consider problems in testing, changes in requirements, control of engineering changes, length of product maturation, and effects of lead times. The plan should suggest preferred responses to program problems disruptive of progress.

MANAGEMENT OF THE PROGRAM

The management structure is directly related to acquisition strategy. A program can be wholly U.S. managed, joint-consortium managed, or NATO managed. The management organization necessary to facilitate the program usually consists of a part-time NATO program steering committee and a multi-national full-time management group. The steering committee controls the program by providing guidance and direction to the management group. A high-level representative from each participating NATO country sits on the committee. Meeting as necessary to make decisions, the committee issues regular reports to the NATO CNAD about program status, and is responsible for liaison with the NATO military authorities for planning integration of the system into the participating countries' inventories. Each representative to the steering committee provides his country's policy and position guidance. The MOU, signed by the participating countries' representatives, specifies the form and structure of the management group responsible for detailed management, evaluation of alternatives and planning. The management group may consist of representatives from each participating nation. A policy group may be formed at the military Service level to provide coordinated U.S. policy and guidance to U.S. members. Position guidance is established through coordination with the Department of State, Office of the Secretary of Defense, and military Service staff agencies. Chapter 6 discusses the structuring of the management organization necessary to facilitate the program.

MANAGEMENT OF THE REQUIREMENT FOR MULTILATERAL PROGRAMS

A multinational program offers an international dimension to the acquisition strategy for management consideration. A multinational program strategy can be structured from the beginning if the proper bilateral or multilateral requirements fit can be found. Chapters 2 and 3 discuss multinational program initiation via Memoranda of Understanding (MOUs) and the Periodic Armaments Planning System (PAPS) respectively. It is sufficient to summarize from these chapters that when the early stages of the acquisition process are conducted properly, the following goals should be achieved:

- The system's performance specifications match its mission requirements.

- Alternate ways of performing the mission are explored before systems are selected.

- A variety of associated technologies and subsystems are considered, and the development is initiated so that the technology will be available to meet new threats and needs.

The PAPS allows for development of competing alternative technology approaches by the participating countries, with the mission need document (MND) procedure making the requirements process more orderly. The MOU at the end of selected phases within PAPS signifies the agreement to support the requirement through specific bilateral or multilateral arrangements. The PAPS/MOU process tends to reduce the influence of national and contractor advocacy in deciding what systems are to be acquired and helps ensure that alternatives for satisfying the mission need are considered.

The RSI Acquisition Strategy should be developed immediately following approval of the Mission Need Document (MND) and the formation of a NATO sub group for the program. The strategy will become a source for the Outline Staff Target, Staff Target and the various MOUs required as the program progresses. It should address program alternatives, trade-offs, and selection of the appropriate alternative to meet the MND and program objectives. The strategy must be tailored to the unique requirements of the specific acquisition effort and the different phases of the acquisition cycle. Prior to the Project Definition phase (PAPS Phase 04), the program manager should complete his plan for codevelopment and co- or dual production. The strategy for co- or dual production must be updated prior to initiating the negotiation of the MOU for the Production phase (PAPS Phase 06). A complete listing of considerations is given in Appendix B, entitled "Life Cycle of Major System Acquisitions Including NATO Considerations."

TECHNICAL STRATEGY

The technical strategy is the approach for achieving the program's system performance, design and reliability goals. Unlike a domestic program, where technology to optimize system performance may be pursued, the program manager might have to attempt to integrate the technological capabilities of several different national economies. Programs should be tailored by partitioning the standards and systems specifications to suit that program's complexity. A key consideration in the technical strategy is the degree to which the participating nations will share in technology transfer.

The difficulties of developing and/or producing a system within the boundaries of the U.S. technological environment become even more complex when it is necessary to use and integrate several foreign technologies. Problems inevitably occur when the technical strategy involves integrating subsystems or components which are products of different countries, and therefore derived from different technological approaches. In these situations, the cultural differences which influence the way that Europeans deal with problems will also impact on arriving at a workable technical strategy. These cultural differences are discussed in Chapter 4 on the European Overview.

A major consideration of any technical strategy is the selection of alternative concepts, approaches or systems to fill the mission need. It is

policy, under a domestic program, to maintain alternatives, commensurate with the risk and technological uncertainty, so that existing or maturing systems are considered, as well as state-of-the-art technical approaches. In a NATO program, political factors complicate these considerations, as participating governments may dictate that their specific systems or technical approach be used. PMs must therefore walk a narrow path in trying to maximize the effectiveness of the selected technical approach, while still meeting the conditions imposed by the participating governments.

It is defense policy that metric measurements shall be used in all of its procurements unless such use is not in the best interest of the Department of Defense. In the latter instance, justification shall be documented.

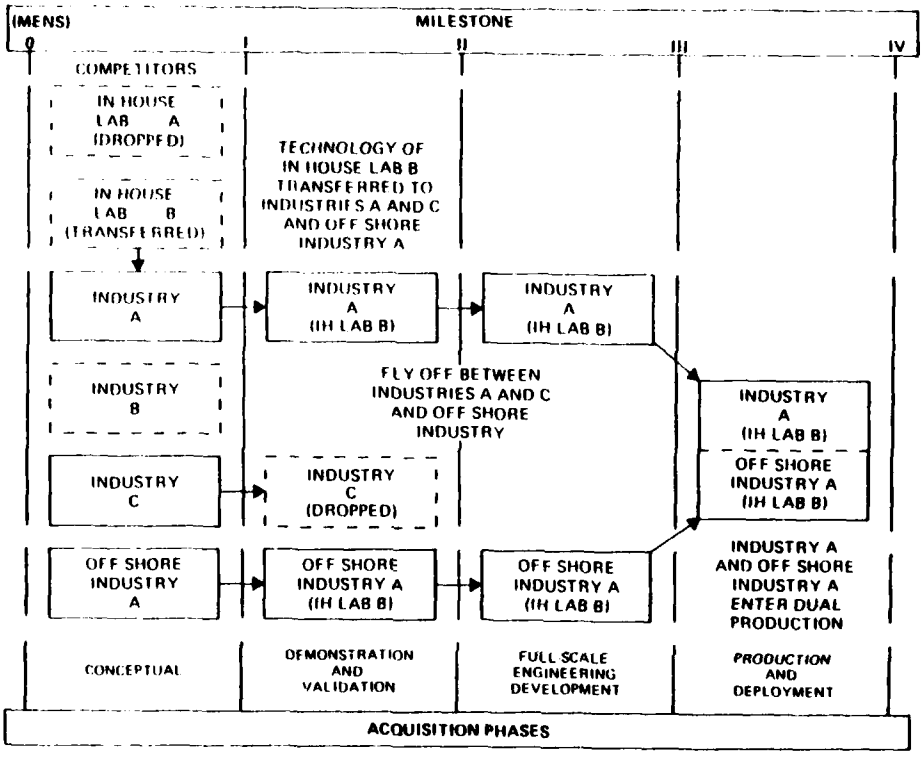
Technical Advances

The technical strategy should include a listing of critical pacing technology advances required to satisfy the program thresholds. The initial RSI Acquisition Strategy after approval of the MND and formation of the NATO subgroup may only contain a few of the pacing technology advances required, because not all weapon system alternatives have yet been explored. However, as the Prefeasibility phase (PAPS Phase 02) proceeds, necessary advances become more defined through study of the preferred alternatives. The kind of pacing technology advances required for each alternative system determines the technology risk used in the analysis of the alternative concepts. Once the preferred system is chosen, and the Staff Target is approved, the technology advances required should be well-defined, and the risks for developing those technologies should be understood in terms of performance, cost, schedule, and supportability thresholds. The PM must then consider these risks in following his program acquisition strategy by assigning and controlling critical resources (time, money, personnel) appropriately, with special attention to the critical pacing technologies.

When technical risk and progress are acceptable, parallel, short-term fixed-price contracts are sometimes used to evaluate and explore selected concepts. This can aid in reducing technical uncertainties for alternative approaches. Unsuccessful approaches are eliminated by continuous evaluation of contractor/in-house laboratory efforts. Figure 5-1 is an idealized example of parallel development efforts to maintain competition. Two government laboratories, three U.S. industry participants, and one European contractor develop and investigate the feasibility of various concepts. The successful feasibility study done by one government laboratory is provided to the two selected U.S. companies and one European NATO participant for the demonstration and validation phase. A fly-off competition among the three participants' prototypes results in selection of one full-scale engineering development approach, with a team arrangement consisting of the European industrial partner and the remaining U.S. industry participant, resulting in a dual-production agreement.

Chapters 9 and 12 cover the various aspects of engineering management and technology transfer, and manufacturing and production management, respectively. These chapters discuss translation of technical data packages, differences in engineering practices, training of production personnel and a host of issues that need to be considered in codevelopment and coproduction programs.

FIGURE 5-1. METHODS TO MAINTAIN COMPETITION DURING THE LIFE CYCLE



Technology Release Plan

The technology release plan provides detailed planning actions required because certain technologies needed for production, may not be releasable to NATO contractors, or they may pose problems in performing the cooperative effort. Such technologies fall into five categories:

1. Security. Items of hardware and software affecting national security which are either controlled or deemed unreleasable for foreign production, e.g., by the National Security Agency (NSA). These include communications security equipment (COMSEC) and items, logic, or documentation that the United States does not release, even when doing so would add to the overall NATO capability.

2. Configuration Control. Items of software and hardware for which controls are required to assure the interoperability of the co-produced system. Items in this category will be considered for release for manufacturing, but strict control is needed.

3. Critical/Sensitive Advanced Technologies. Technologies for which there is a ban on exporting the capability to produce the item or its equivalent.

4. Buyer Considerations. Technology for which the participating NATO contractors have not demonsrated a capability to produce the items or its equivalent; technology whose cost of associated tooling and/or test equipment is significant, and technology for which it is difficult and expensive to accomplish technology transfer.

5. Unconstrained. Items and technologies that are wholly releasable for which it is assumed that European equivalents will be used.

To build this plan, a work breakdown structure (WBS) is used to decompose the producible end item into its several hardware and software components, which are then classified into one or more of the five categories listed above. For those items in categories 1, 3, and 4, purchase of specific end items from a U.S. vendor is required. Licensing agreements between vendors should be considered for technology transfer whenever European equivalents are not acceptable.

CONTRACTING STRATEGIES

The MOU stipulates which country's contracting practices are to be followed or modified. Thus, the contract for the JP-233 system, a joint U.S.-U.K. program, utilized U.K. contracting practices. Similarly, the Rapier system developed and produced by the U.K. and being procured by the U.S., is being bought under the U.K. contracting system.

Contracting Approach

The program may frequently be constrained by contracts or other commitments made prior to the current acquisition life cycle phase. For example, technology developed by a contractor under his independent research and development program or from a foreign developer holding intellectual property rights (see Chapter 8 on this subject) may be available to the government only if his participation in the program continues. The program manager should identify all such contracts or commitments and understand their influence on his program. Elements in other contracts that affect the program, such as for related platforms and subsystems should be identified. Many programs depend upon other projects and government agencies for their subsystems or components. An example is the Multiple Launch Rocket System (MLRS). The derivative vehicle used as the basic carrier is the responsibility of the U.S. Infantry Fighting Vehicles Systems Office. The project manager's office for Selected Ammunition at Picatinny Arsennal is responsible for modifying and supplying the M-42 submunitions. Harry Diamond Laboratories is developing the XM-445 electronic fuse for the MLRS. The MLRS program is also a codevelopment program in which the United Kingdom and France provide funds to support the U.S. development effort, and Germany develops a scatterable mine warhead. Most large programs are broken up into manageable project offices and integrated through development and production schedules.

The program manager can make use of different types of contracts that have evolved and survived the test of time. They were developed to fit particular circumstances and, insofar as possible, provided a fair and equitable legal relationship for participants. Each major system acquisition program has unique features; differences in the contracting approach can be expected to harmonize time, cost, technology, and management environment. The AS allows innovative contracting approaches. Through consideration of program goals and objectives, the PM should be able to develop a compatible contracting schedule, and select a contracting strategy that maintains competition when practical, so as to utilize resources effectively, and reduce development time by allowing contractors and in-house personnel to explore competing approaches. Contracting is a tool in the acquisition process, not a substitute for management. The contracting strategy must consider the impact of procurement lead times, preclude "technical leveling" between competing contractors, and encourage innovation in proposal submittals for the next planned increment.

Differences of working in multinational contracting are discussed in Chapter 7, Contract Management, which provides a review of the current and recently published Section VI of the Defense Acquisition Regulation (DAR) for international programs.

Prior to negotiating a contract with a U.S. prime contractor requiring foreign subcontractors or directly with a foreign contractor, it is essential that the following be accomplished:

- A review by DoD of mandatory flow-down provisions must be undertaken for the purpose of deleting or diluting those requirements which are unworkable or not applicable for foreign procurements.

- Solicitation Preview Panels must review Request for Proposals or proposed contract provisions prior to instituting discussions with foreign suppliers or governments to determine the necessity/desirability for inclusion of each clause. Results of this review must be made available to the negotiating team, whether from DoD or industry.

- Government/Industry teams should be tasked to document difficulties in imposing mandatory flow-down provisions on foreign suppliers. This documentation should be made available to DoD personnel for review with the goal of deleting or diluting those deemed to be unworkable or not applicable to foreign suppliers.

Preceding this review, it is also essential that the relationship between the prime contractor and the governments be addressed in the MOU. In the NATO E-3A (AEW&C) program for example, contractual terms and conditions relating to indemnification, pricing rules, taxes, technical data, and patents became problems for the prime contractor because the MOU did not properly address these issues. U.S. Government should make an effort to involve U.S. industry in MOU activities as an advisor/consultant, but should recognize the possibility of differing government-industry objectives. In processing major foreign military sales cases, the MOU/LOAs between the U.S. Government and foreign governments should indicate that Terms and Conditions of any offsets will be negotiated by U.S. industry directly with foreign industry. When

agreeing to offset goals/commitments in MOUs, the PM should not use percentages but instead identify offsets in terms of work packages, specified items, components and/or subsystems.

Contracting Methods

There are various contracting methodologies which should be considered during the different phases of the life cycle. These include co-development teaming, use of a technology transfer clause, leader-follower arrangement, second sourcing, breakouts, and pre-planned product improvement.

Codevelopment is an effective technology transfer method for cooperative activity within NATO. Teaming of domestic and foreign contractors provides benefits in terms of price and technical competition. Teaming is especially useful when one contractor does not have all the resources to accomplish development and production. Therefore, at some point in time, the teams may also be used to compete the production contract.

If competition is used during development, a technology clause in the development contract should require the licensing of data and technical information to the winner of the production contract if it is a different company. The production firm pays royalties and compensation for technical assistance to the licensor. There can be problems with this strategy because many companies are reluctant to part with proprietary information. This can result in critical production delays and in "buy-ins" by firms desiring trade secrets.

U.S. firms may decide to "team" with foreign firms to facilitate the transfer of technology for business reasons. This arrangement may also result in certain competitive advantages for the contractor where NATO standardization and interoperability are at issue. Teaming allows the U.S. firm to operate overseas on its own terms and several of the problems of legal rights in invention, data and software disappear if the foreign firm also is involved throughout the development process. The teaming mode is expected to be a preferred manner for penetrating the European defense market because it facilitates dealing in foreign countries since one of the team is located there, and technology transfer is simplified. Teaming may well restrict competition in the U.S. because of its private nature, thereby reducing the options open to the P.M. The U.S. government may then desire to buy an assignable license from the team in order to compete the U.S. procurement.

Leader-follower procurement establishes contractual arrangements during the development phase for the lead contractor to transfer technology to other firms for establishment of production lines. This strategy has been used extensively in naval shipbuilding programs, the TOW missile system, and for transferring certain production capabilities to our NATO allies. The leader-follower concept has more often been used to obtain increased production capacity rather than increased competition, partly because of the difficulty in motivating contractors to transfer technical expertise if there is a threat of losing future contracts.

Under second sourcing, firm(s) performing development provide the government a complete technical data package (TDP). The DoD normally validates the drawings, specifications, and other technical information before

it transfers the TDP to other suppliers to establish one or more production lines. This method can be used only with comparatively large programs because of the cost involved in setting up duplicate production lines. However, second sourcing or threat of second sourcing can be helpful in reducing costs through creating competition. It has been used successfully for small missiles (Sidewinder and Bullpup), target drones, aircraft engines, and torpedoes.

The U.S. government will use its best efforts to help arrange for the receiving country to receive the relevant technical data packages. It is cautioned that an explicit or implicit warranty of the TDP should not be given. However, the PM should make every effort to insure that the TDP is valid. He should also provide help in setting up technical assistance from the relevant U.S. contractors.

Pre-planned product improvement is an area where competition can be encouraged. Such improvements normally are initiated at the time of the initial design freeze to accommodate requirement changes by the user (given sufficient system growth potential), extend the system capabilities into new mission areas, correct minor deficiencies discovered in testing, and integrate new technology to enhance performance.

The tailored AS may permit component/module product improvements for breakout to second sources or they may be provided as government-furnished equipment (GFE) in the form of standardized modules. Breakouts involve competitive reprocurement of spare parts and components for weapon systems. Breakout has been especially cost effective when the weapon system producer is an assembler and piece parts are available from other vendors.

These techniques for competition require the program manager to possess an adequate data base, a knowledgeable in-house team, and a detailed definition of the objectives of the contracting strategy. Patent and data rights must belong to the government or equivalent products be available from other contractors for competition to be effective. Specific clauses for technology transfer must be inserted into the original developer's contract early in development to assure that proprietary rights are not a roadblock to competition. The contractor should at least be required to list all proprietary rights prior to the contract initiation. It is well recognized that a technical data package (TDP) is rarely adequate for recompetition; some form of technology transfer is normally required between contractors.

In considering the above techniques to enhance competition in development and production phases, an economic analysis is required to estimate net long-term savings and impact of technical competition. Nonrecurring and start-up costs, learning-curve effect, technology transfer cost, inflation effects, and hardware costs must be considered. The government administrative personnel burden and costs for additional engineering, contracting, and testing support should also be included. In addition, DoDD 2010.6, 5 March 1980, states that "Commercial implications of technology transfers proposed in support of a collaborative project should be considered when weighing the costs and benefits of that project. These considerations should include an estimate of how the commercial applications of the technology transfer might affect U.S. commercial competitiveness in future international markets." The Secretaries of the Military Departments are

responsible to "prepare the technical positions on individual exchanges of technology and prepare a statement of the potential impact of impending technology transfers on the U.S. economy when such transfers can be identified as having significant commercial implications. The Military Departments are encouraged to consult with industry and knowledgeable U.S. Government agencies to assess commercial implications of technology transfers."

Using competition to drive research and development may result in shortening the acquisition cycle by allowing "doubling up," involving substitution of a shorter maturation phase with parallel completion of research and development, and low rate initial production (LRIP) for full-scale development. This meets the challenge to shorten the acquisition cycle time to field a system. Doubling up can be most effectively used on low-technology systems where high schedule and cost risks are acceptable due to urgency of the requirement to meet critical threats or needed capabilities. Examples of current systems employing a doubling-up technique are the Multiple Launch Rocket System (MLRS), Division Air Defense (DIVAD) Gun, Single Channel Ground and Airborne Radio Subsystem, Air Launched Cruise Missile (ALCM), and XM-1 tank. Without doubling up on these systems, the initial operating capability (IOC) would be delayed 2-4 years.

BUSINESS AND FINANCIAL MANAGEMENT STRATEGY

Another major component of the AS is the business/financial management strategy encompassing all the aspects of the program pertaining to funding and budgeting, investment decisions, utilization of personnel and contractor resources, schedule management, evaluation of the business base, etc. It addresses such issues as the amount, timing and sources of funding; the weapons system developer and manufacturer organization and sources; the extent of competition to be infused into the program; the apportionment of development/production tasks and responsibilities among the various nation's industrial sectors; and potential use of leader-follower procurement or second sourcing.

One of the key decisions in any NATO program's business strategy is the selection of the prime contractor, associate contractors and subcontractors. These decisions are obviously affected by political considerations required by offsets to the participating countries. The program manager must assess and evaluate each participant's defense and commercial industrial base. Extensive research may be required by either the program office personnel in liaison with the participant's Ministry of Defense or by the U.S. contractors. The PM must develop an understanding of the capabilities of the industrial base to structure the program properly under the political constraints.

For domestic programs, OMB Circular A-109 emphasizes use of strategies which will maximize competition throughout a program's life cycle. When several foreign countries are participating in a program, options on competition may be limited to the early developmental stages of a program, or for a particular system/component within one of the participating nations. Competition may be limited because of offset requirements, intellectual property issues, or many other possible conditions/decisions incorporated into the acquisition as a result of agreements in the MOU. The PM's task remains, however, to obtain the best possible benefits within the conditions imposed by the governments.

The business/financial plan must address utilization of available assets, to include support via both foreign and domestic matrix management, systems contractors, government laboratories, universities, and industry.

One method sometimes employed by program offices to reduce the number and frequency of contract actions they manage is to use an integrating contractor. In this case a major contractor is selected essentially to coordinate activities of a family of other contractors working on various parts of the program. This may be accomplished in two ways. One method places a prime contract with a firm which then subcontracts for the various parts of the program. In another method, the project places the contracts, but employs a single contractor to provide technical coordination of the work of the other contractors. If resources available within the program office are inadequate to manage a multitude of contracts, either of these methods is a viable way of reducing the workload.

Affordability is another issue to be addressed in the business/financial strategy by the PM. The outline staff target and staff target should include an analysis of overall capability requirements, priority of need, and resources required. Affordability in this sense is what each participant can bear either in a multilateral sense or from NATO infrastructure funds for a NATO weapons system.

INTERNATIONAL INTEGRATED LOGISTICS SUPPORT STRATEGY

Logistics planning and programming strategy will be directed towards avoiding significant reliability and durability problems by stressing planning from a life cycle cost perspective. The logistics strategy should involve achieving the minimum required level of readiness at the lowest possible life cycle cost. The anticipated problems are to be identified as critical technology advances when they are significant enough to affect performance thresholds for the system. In addition, industry capacity to produce critical components, long subcontractor leadtimes, use of commercial systems and components, and use of commercial logistics support should be considered by the PM. Centralizing the defense logistics functions via consolidating management of individual nonconsumable stock-numbered items of equipment and expeditiously transferring NATO consumable items to the NATO Maintenance and Supply Organization (NAMSO) or other appropriate organizations, and use of the Standard Integrated Support Management System (SISMS) should be considered for very early implementation in the initiation of the logistics program. By coupling the manpower and logistics functions, support of the weapons system should be emphasized in the acquisition process.

The two chapters on Logistics and Engineering Management and Technology Transfer discuss the various aspects of technical management to include core DoD requirements, configuration management, pre-planned product improvement, software management, and the joint engineering review process. STANAG 4159 requires that a Joint Configuration Control Committee (JCCC) be established for each multinational co-development or coproduction program. The MOU for a co-development program shall designate the national members and chairman of the JCCC who shall be at program manager level. Effective accomplishment of RSI during development requires joint agreement on the level of authority vested in the JCCC members and body. To maintain the agreed-on degree of RSI in the system, configuration baseline changes must be jointly approved by all

participating nations. Refusal of one participant to comply with a configuration baseline change decision will reduce RSI accordingly. Only those functional and physical characteristics essential for interface interchangeability should be designated as baseline characteristics under JCCC control. To encourage maximum agreement on baseline changes, disagreement at the JCCC level shall be elevated to a Joint Configuration Control Board (JCCB). Senior national authorities shall constitute the JCCB. It should be noted that when system responsibility transfers from the R&D command to the Logistics Command special arrangements such as the JCCB, JCCC, currency conversion arrangements, etc. may require rework at the insistence of the gaining command.

STRATEGY FOR REDUCING RISK

During the development program, efforts should be directed to reducing risk to an acceptable level. Since that is the fundamental purpose of research, development, test and evaluation, much of the acquisition strategy will depend on what the program manager determines to be the major remaining uncertainties about cost, schedule, performance, and supportability. These uncertainties will change, as the program progresses, forcing reassessment and revision of the acquisition strategy. The RSI Acquisition Strategy should specify those major problem or risk areas to be overcome to achieve the overall MOU program objectives and goals and help in the selection of the most appropriate approach.

When program risks have been identified, the program manager should identify the four complementary methods available for reducing them to an acceptable level:

- ideas or concepts
- studies and analyses
- prototypes or demonstrations
- tests and evaluations

His blending of the four should be governed by the stage of the acquisition program, nature of the risk, and the time and money available.

Competitive demonstrations are effective for evaluating alternative system designs. They must include a reaffirmation that the alternative is satisfying mission need and program objectives, and verification that the chosen concepts are sound, and can perform in the intended operational environment. Competitive demonstrations can provide an effective basis for selection of the systems or critical subsystems to be continued through full-scale engineering development.

The primary objective of the test and evaluation program as discussed more fully in Chapter 11 on Foreign Weapons Evaluation is to discover significant technical and operating deficiencies which can affect the acquisition of reliable, effective, and supportable weapons systems for our NATO operating forces. The development of a comprehensive test and evaluation master plan (TEMP) as an integral part of the acquisition strategy is essential. Data should be included from our NATO allies' test and evaluation programs, that

are useful to evaluate the system suitability for the intended mission, for force structure planning, for definition of needs, and for weapons improvement, if appropriate. In addition, candidate NATO and ABCA weapon alternatives should be assessed against the U.S. requirement via a formal foreign weapons test and evaluation.

SPECIAL CONSIDERATIONS FOR APPROVAL OF TECHNOLOGY TRANSFER

Foreign participation in U.S. programs is governed by the National Disclosure Policy, International Traffic in Arms Regulation, Arms Export Control Act, Export Administration Regulation and other statutory or administrative policies. Some specific factors that must be considered concerning technology transfer and information disclosures are:

- releasability of classified information,
- releasability of sensitive advanced technology,
- arrangements and agreements for handling intellectual property rights.

When these factors are not resolved early-on, they can be expected to result in problems with technology transfer, evidenced by:

- delays in munitions licensing,
- denials or delays in the clearance of certain classified information for release to foreign governments,
- conflicts in the transfer of intellectual property rights.

The principal difficulty is not with the policies themselves as described in Chapter 14 on Disclosure of Military Information, but rather that too often decisions and commitments are made without due consideration of all the relevant factors, or without consultation with elements of DoD and Industry who would implement such programs. Thorough consultation at the working level with action agencies of the Government and similar industry groups is a necessary prerequisite to the formulation of intelligent and feasible international cooperative ventures.

MODES OF NATO ACQUISITION STRATEGY

This section deals with the observed modes for international weapons development and production. These modes are discussed as alternatives for the program manager's acquisition strategy development. Eight different modes have been identified as used in NATO programs:[1]

- Mode 1 - License production in one European nation;
- Mode 2 - License production in Europe by a multinational consortium of a system developed in the U.S.;

[1]Foxcurran, Robert R., "Three Decades of Multinational Collaboration for Defense Procurement Within the North Atlantic Alliance: A Business History," Unpublished Masters Thesis, University of Washington.

- Mode 3 - Co-development and coproduction among European nations;

- Mode 4 - License production in the U.S. of a system developed in Europe;

- Mode 5 - Transatlantic joint development;

- Mode 6 - Bilateral offset arrangements for the purchase of a foreign system;

- Mode 7 - Transatlantic joint production or systems management by a U.S. led consortium;

- Mode 8 - Package deals and the "Family of Weapons" concept.

Mode 1 - License Production in One European Country

The oldest method of international production used by NATO members has been the production of weapons systems in one country of a system developed in another NATO country under a bilateral licensing agreement. Under this mode, the production technology developed in a particular country is transferred to a foreign manufacturer under a formal licensing agreement which authorizes use of the developer's data and manufacturing technology to produce the same weapons system. This mode can be accomplished through a coproduction MOU between countries with licensing between contractors. Examples of programs using this mode include:

a. Bell helicopters built in Italy and the Federal Republic of Germany (GE),

b. British Vampire fighters built in France, and

c. Fiat G-91 fighters built in the Federal Republic of Germany.

European countries have the most experience with this mode, and the U.S. has the least. To insure success in this mode, there must exist maximum cooperation between the licensing and licensee companies. The cooperating governments under this mode should have only a monitoring responsibility, with the majority of work being controlled and managed by the companies.

Mode 2 - Licensing Production of a U.S. Developed System in Europe by a Multinational Consortium

Under this mode, a system which has been developed and manufactured in the U.S., is licensed to a multinational consortium for production in Europe. Similar to Mode 1, the technology and production techniques of a U.S. weapons system manufacturer are transferred to European firms for their use. Examples of this mode include:

a. F-104G fighter production in the Federal Republic of Germany (GE), Italy, Belgium, Denmark, Norway, and the Netherlands;

b. HAWK surface-to-air missiles production in Belgium, GE, Netherlands, Italy, and France;

c. Bullpup air-to-surface missile production in the UK, Norway, Denmark, and Turkey.

Under each project, there existed an international project office which was operated using two different organizational concepts. For two larger projects, the HAWK and F-104G, using the first concept, the project office coordinated the efforts of all participating nations' procurement systems. Under the other concept, used for the Bullpup, the project office worked through only one nation's procurement system, with that nation's contractor acting as the prime. Industries from the other participating countries then acted as subcontractors to the prime.

Mode 3 - Co-Development and Coproduction Among European Nations

This mode is a natural outgrowth of Mode 2 in that not only do firms jointly produce a system, they also jointly design and/or develop the system. Under this mode, a multinational management scheme is established to coordinate the efforts of organizations in several European nations in developing and manufacturing a weapons system. Some of the programs which have operated under this mode include:

a. Transall cargo transport aircraft, a Franco-German project;

b. Martel anti-submarine missile, an Anglo-French project; and

c. Euromissile's ROLAND, HOT, and Milan, Franco-German missile projects.

Under this mode, there have been four organizational systems in use since the late 1970s. The first one consists of the permanent binational project office and its counterpart Groupement d'Interet Economique covering the three Franco-German tactical missile projects. The second system involves the Anglo-French Projects Committee overseeing Project Management Committees for each of the three joint helicopter development programs. One nation's government handles the procurement with its industry acting as the prime for any given project. Under the third system for the Alpha-jet, the procurement takes place through one nation's procurement system with its own firm acting as prime. And finally, there is the case of an international system selected by NATO for production, which is managed by a NATO project office that procures the system from an international company.

The most significant characteristic of Mode 3 is the high degree of integration which is necessary in this type of intergovernmental and inter-industrial arrangement. Because of the sharing of work among the cooperating parties, there is a considerable transfer of technology to potential continental competitors.

Mode 4 - License Production in the U.S. of a European Developed System

This mode represents the reverse concept of that found in Modes 1 and 2. It involves acquiring a European developed system through either direct purchase of an off-the-shelf system, license production of a more or less "Americanized" version of the system in the U.S., or development of an advanced version of the system using the purchased technical data package.

This represents a reversal of the classical pattern within the NATO countries of using American developed weapon systems. With the increased capability and successes of jointly sponsored European system development and production programs, this mode has become a more viable and appealing alternative for the U.S. Department of Defense, especially in achieving enhanced RSI within the NATO alliance.

Often, the motivation for pursuing this mode has been less a desire to increase the use of foreign technology by the U.S., than to obtain a needed piece of military hardware with a short development leadtime. Benefits in terms of cost savings and reduced leadtimes can be achieved as proven in the U.S. Roland program. It has been estimated that the cost of developing a comparable U.S. system would have cost $1.2 billion, while requiring 8-10 years from concept to a low rate initial production (LRIP). The actual cost of the U.S. Roland, based on the European developed system, was only $300 million and took less than four years.

Some other examples of programs following Mode 4 include:

a. B-57 bomber, derived from the English Electric Canberra;

b. AV-8 Harrier aircraft, a British developed vertical take-off and landing fighter; and

c. AN/TPS-58, the French developed RATAC ground surveillance radar.

It might be assumed that since U.S. industry has considerable experience in moving U.S. developed systems into European license production, that the reverse process would not be difficult. That assumption is incorrect. American firms have experienced difficulties in understanding, coordinating, and using European data and drawings. They have found a lack of standardization and consistency of method, numbering systems, descriptions, etc., especially when dealing with multiple subcontractors and vendors on a system. The lack of a standard convention for data and drawings within Europe has made the task extremely difficult. Additionally, U.S. firms often come across methods, processes and technologies in the manufacture of European developed systems which are either unavailable in the U.S. or with which they have no previous experience. These problems must be overcome to ensure success in this mode.

Mode 5 - Transatlantic Joint Development

This mode involves a joint development program with both American and European industry participating, with possible follow-on joint production. In this mode, the cooperation and partnership of all the participating parties is the key factor which will ensure the success of the program. The needs, desires, and capabilities of both the American and European participants must be channeled into the management and decision making process from the concept phase through the remainder of the program.

Transatlantic joint development represents a significant step in improving RSI since a joint research and development effort will often produce a better system at a lower R&D cost to each participant, and should help to

achieve the operational and logistical advantages of a commonly acquired system. This mode can often be more acceptable to the partners, both European and American, since the respective national industries can share in the development of technology, manufacture of portions of the weapon system and employment of workers, rather than the all or none aspect of single nation programs. This concept has been tried in the AV-8 fighter program, Mallard tactical communication system, and the NATO Sea Sparrow surface-to-air missile program.

Because of its joint nature, programs conducted under this mode should possess some of the following characteristics. First, the system configuration, and approximate cost and schedule should be identified by the participating countries and agreed upon early. Second, there should be early agreement among the participating countries as to cost sharing and allocation of work so that detailed planning and early commitment to the program can be made. To be equitable, a country that wishes to participate in program decision making should make a firm financial commitment to the program. Third, a clear chain of command for the program organization should be established. This mode will operate best if there exists a single program manager and office which can act under a multinational steering committee for program direction. Programs which have not operated under a similar chain of command have been unsuccessful. Lastly, this mode will operate successfully when all participating countries have a share of the work, based on the equity which they contribute to the program.

Mode 6 - Bilateral Offsets

This mode involves some type of offset by one country as a result of selling its system to another country. Based on an agreement to acquire a particular piece of military hardware, the selling country agrees to compensate partially the buying country by "offsetting" a portion of the effect of buying a foreign system or hardware. These offsets can cover a wide range of categories such as financial, industrial goods, other military or non-military goods, internal offsets of subsystems or components of the system being procured, second source offsets, etc. It can be viewed as a partial restitution by the seller, so that the economic effect of a totally foreign buy is not fully borne by the purchasing economy. Thus, if country A decides to buy an aircraft from country B, an offset might provide for country B to buy some equipment from country A.

This mode has been used with the sale of U.S. F-4 aircraft to GE and the UK, U.S. F-5 aircraft to Switzerland, the GE role in the Leopard I tank development, and the Australian Industrial Participation Program for the FFG-7 ship construction and Lockheed P-3 aircraft program.

Offset agreements run a gamut of varying arrangements from waiving restrictions to the Buy American Act to setting up U.S. aerospace firms as trading agents for the industries of the buying country. In the negotiations for purchase of the F-111K by the United Kingdom, the U.S. agreed to waive Buy American restrictions on British firms competing on an equal basis with U.S. firms for military contracts. When the U.S. sold F-5 aircraft to Switzerland, the Northrop Corporation, manufacturer of the F-5, agreed to find U.S. markets for numerous and varied Swiss firms. In other instances, the two parties to a program might agree to offsets with a third country, based on commitments in other countries.

The next mode discussed is basically an expansion of Mode 6 from a bilateral to a transatlantic multilateral basis.

Mode 7 - Transatlantic Joint Production and/or Systems Management by a U.S. Led Consortium

This mode is basically an expansion of Mode 6 but is multilateral rather than bilateral. These U.S. led joint production and/or systems management consortia involve no joint development, and are for systems being purchased by government consortia after a multinational competition. Examples of this mode include:

a. The F-16 aircraft being produced by the U.S., Belgium, Denmark, Norway and the Netherlands;

b. The HAWK European Limited Improvement Program which included the U.S., Italy, France, Federal Republic of Germany, and the Netherlands.

In this type of complex acquisition arrangement, the first step is usually the signing of a Memorandum of Understanding (MOU) by the Governments, or some governmental organization of the consortium countries.

The MOU then becomes the basic charter for the conduct of the international program. A consortium steering committee is organized to provide overall program direction to the program office which will manage the program for the consortium. This program office is usually an existing U.S. DoD organization which has already managed the development of the system and the initial stages of the U.S. production phase. Because of this organizational overlay of the international program on the U.S. program, many of the methods and procedures will be based on the Defense Acquisition Regulation and other DoD acquisition directives. However, representatives of the participating governments will be integrated into the program office, and will give some of the program management a European twist. These representatives will be responsible for protecting their countries' interests in program management decisions and sit on such key committees as the Joint Configuration Control Committee (JCCC).

In order for this type of program to work most effectively, a strong unilateral program should exist in the U.S. prior to transatlantic coproduction. The program should be mature and have strong home government support before expanding to a multinational program. The complexity of such arrangements also requires that the prime contractor exercise strong program management with all the participating industrial firms.

All in all, this mode of operation represents a complex management situation within which all parties, expecially the U.S. program office, must operate. Successful completion of such programs require flexibility and creativity in coping with the numerous problems having international ramifications.

Mode 8 - Family of Weapons

The "Family of Weapons" concept attempts to harmonize the requirements of a number of different countries within a specified number of projects for a "family" of weapons, for example, missiles. The concept can be applied to projects which are closely related in overall properties but which differ on some important parameter. The goal of this approach is to achieve more efficiency in developing weapon systems by making acceptable trade-offs between the one project approach and the alliance-wide attempt at development of a system. An example will help to explain better this mode. Consider the family of weapons for advanced air-to-air missiles. The U.S. has taken the lead in developing the advanced medium range air-to-air missile (AMRAAM). For the advanced short-range air-to-air missile (ASRAAM), a European consortium has assumed the lead in development. When the systems are developed, production will be allocated to firms in both the American and European industrial sectors.

Several advantages may result from the Family of Weapons approach to weapon systems collaboration. First of all, from the political standpoint, it might be an acceptable compromise as against lopsided development and production in one country. Secondly, it can help avoid unnecessary duplication in R&D efforts between the participating countries. Thirdly, this mode can result in greater technology sharing between participating countries resulting in a more state-of-the-art system. At the same time, it must be recognized that efforts to reach compromise may lead to diluted requirements.

COMPARISON OF U.S. VERSUS NATO ALLIES ACQUISITION MANAGEMENT

Some broad comparisons can be made with representative NATO allies on the philosophy for managing acquisition of defense equipment. Acquisition management control runs the gamut from departmental autonomy in some countries after the program is funded for production, to management by the Executive and Legislative branches of Government through the annual authorization and appropriation process in the U.S. Programs in Canada, the United Kingdom and Germany are all funded incrementally with their Parliaments and Bundestag providing annual funds to meet total estimated current year cash expenditures. Current year funding is tied to the long-term defense plans developed and approved by the respective Ministries of Defense and the cabinets. Individual programs are not normally reviewed by the legislatures. Based on the program's inclusion in their Long-Term Defense Plan, our Allies normally make commitments to their contractors for the total program. These NATO Allies prepare long-term plans based on need and their estimates of priorities and available funding. If funds are not approved to support the total plan, the Defense managers must decide which programs do not have sufficient priority within the new constraints, and make adjustments accordingly. Figure 5-2 illustrates the fundamental differences in how Canada, the United Kingdom, Germany and the United States manage defense equipment needs.

FIGURE 5-2. MANAGEMENT AND FUNDING OF REPRESENTATIVE NATO COUNTRIES

COUNTRY	MANAGEMENT OF THE PROGRAM	FUNDING OF PRODUCTION PROGRAMS
Canada	Department of National Defense (DND)	Annual Expenditures (Cash Flow) approved by Parliament to support current year total of the DND Ten Year Defense Services Program
United Kingdom	Ministry of Defense (MOD)	Annual Expenditures (Cash Flow) approved by Parliament to support current year total of the MOD Ten Year Long Term Equipment Plan
Germany	Ministry of Defense with some Bundestag review of selected programs	Annual Expenditures (Cash Flow) approved by Bundestag to support current year total of the MOD Five Year Plan
United States	Department of Defense with close oversight by Congress	Annual Authorizations and Appropriations by Program Element under Five Year Defense Plan

CONCLUSION

In the day-to-day press of carrying out this acquisition strategy, the program manager should reserve for himself the occasional opportunity to reassess his strategy. He will want to verify that assumptions continue to be valid, that results of decisions have not taken the program in an unanticipated direction, and that the selected course continues to be directed toward accomplishment of the program goals. The four keys to a successful NATO program are a recognized multilateral need, an RSI Acquisition Strategy that makes sense, management commitment via the MOU to include funding stability, and program follow-through by the participants.

6. ORGANIZATION OF A MULTINATIONAL PROGRAM MANAGEMENT OFFICE

INTRODUCTION

The Program Manager (PM) of a Multinational Program Office provides centralized management authority over all the technical and business aspects of a program. His role is to tie together, to manage, to direct the development and production of a system meeting performance, schedule, supportability and cost objectives which are defined by his charter, Memoranda of Understanding (MOUs) and other promulgating documents initiated by the multinational steering (or Control) group, the DoD or his parent Service. Essentially, he serves as the agent of the multinational steering group, the DoD and his Service in the performance of the multinational system acquisition process, armed with authority and responsibility given him by the steering committee, DoD and his Service for running the program. From his vantage point as PM, he possesses a wide perspective of the program and the interrelationships among its elements. He must be the major motivating force for propelling the system through its evolution. Management of the specific functional specialties (i.e., Contracting, Engineering, Production, Financial Management, Test Management, and Logistics are covered in other chapters in this guide.

The military multinational program/project manager occupies a unique position in the managerial world. Unlike most managers, he is largely dependent on outsiders to get his work done. Although he has some staff of his own, for the most part the real work of the program is performed by personnel outside his immediate office, including people from his parent organization or Service, other governments, as well as contractors from his country and overseas.

In the past, few major systems acquisition programs started as multinational efforts. Most were preceded by individual or joint Service efforts, often after much research and development, both by the military and individual contractors. The reasons for advocating a multinational development effort are many and varied, but they are ultimately reducible to certain operational, economic or political considerations by all parties involved -- the U.S. Government, DoD, individual U.S. Military Services, our allies and their military, U.S. defense contractors, and foreign defense contractors among others.

Typically, one or more of the following factors is at work:

- Improved National and Collective Defense
- Reduced Development and Production Costs
- Improved Armament Cooperation
- Enhanced Interoperability of Equipment
- Improved Standardization and Reduced Logistics Requirements
- Enhanced Technology and Information Exchange

PROGRAM OFFICE STRUCTURES

The objective of this chapter is an appreciation of the major factors and policies associated with the tailoring of a program office to manage a multinational project and the importance of a comprehensive Program Management Charter. There are no standard structures for multinational programs. Each is an *ad hoc* arrangement. The program structure depends upon the size and goals of the program, the phase of the program in the acquisition process, the desired cooperative arrangements among the countries, and the role of OSD and the Services in the program. Although many variations exist, multinational programs can be broadly classified into three categories: a single-country program office, a jointly staffed program office, and multiple program offices.

Single-Country Program Office

Most multinational programs begin as single-country developments, like the AV-8 Harrier. Many bilateral programs, especially small programs, are single-country managed to satisfy joint requirements. For the most part, these programs are structured and managed as they would be if they were single-country programs. The participating country may assign a liaison officer or representative to the program office, or it may simply monitor the program. Normally, the policies and procedures of the lead country dominate the program.

Jointly-Staffed Program Office

The term "joint program" usually conjures up the image of a single, jointly staffed, program office. The lead country provides the program manager, most of the program management staff, and administrative support. The participating countries each contribute a deputy program manager and other military officers to the program management staff. This practice is becoming more common and seems to be the joint program structure preferred by many of our NATO allies. The central program direction comes from a Multinational Joint Program Steering Group.

Multiple Program Office

A number of multinational R&D programs are, in fact, multiple programs or projects whose activities are coordinated. The degree and method of coordination vary from program to program, as does the principle source of program direction. Frequently, a NATO subgroup plays a direct role in the program's execution. Some participating nations insist on forming their own program office for programs involving large financial outlays, entailing complex developments, and having a high degree of risk associated with them. The relationships between these national offices and the overall multinational program office is spelled out in the MOU and other coordinating documents. Central program direction comes from the Multinational Steering or Control Committee.

CONSIDERATIONS IN ORGANIZATIONAL STRUCTURE

As one might suspect, many joint programs in this category have unique management structures. For effective and efficient technology transfer, which

is normally the major objective of a multinational program management office, the management structure should relate directly to the acquisition strategy. There is really a continuum of organizational structures within which foreign acquisitions occur. The participation of countries and firms in a dual or co-production arrangement normally requires a participative management approach with multinational government leadership of the consortium of industrial firms.

The organizational structure must provide the decisionmaking and operational levels required to carry out the acquisition strategy and communications/liaison functions. The assigned program manager for a foreign acquisition must communicate with a wide variety of organizations. Some are internal to his parent organization and others are external to the program. These contacts require the personal attention of the program manager during initial establishment of formal lines of communication, as well as subsequent followup, to keep all program participants informed of progress, problems, and changes to established program thresholds, constraints, and plans.

The organizational structure exists to provide a disciplined, stable, but flexible approach to dealing with the legal, administrative, and technical requirements of the acquisition process. The organization established by the assigned program manager to carry out program objectives must be adequate to get the job done. If the conventional organizational structure proves unsatisfactory, changes should be made without delay.

In the case of foreign acquisitions, organization is complicated by the introduction of new factors -- laws, language, and customs, to name a few -- which are often unfamiliar and may require special staffing. In an environment where responsibilities often may overlap or not be clearly defined, where guidelines are frequently vague or in the process of being changed, and where even ordinary speech contacts may be difficult, the assigned program manager must seek to establish communications along three general lines: (1) with those organizations external to control and direction but with influence over the program, (2) with those organizations that are external to program control but responsive to its direction, and (3) with those internal organizations over which the program manager exerts direct control.

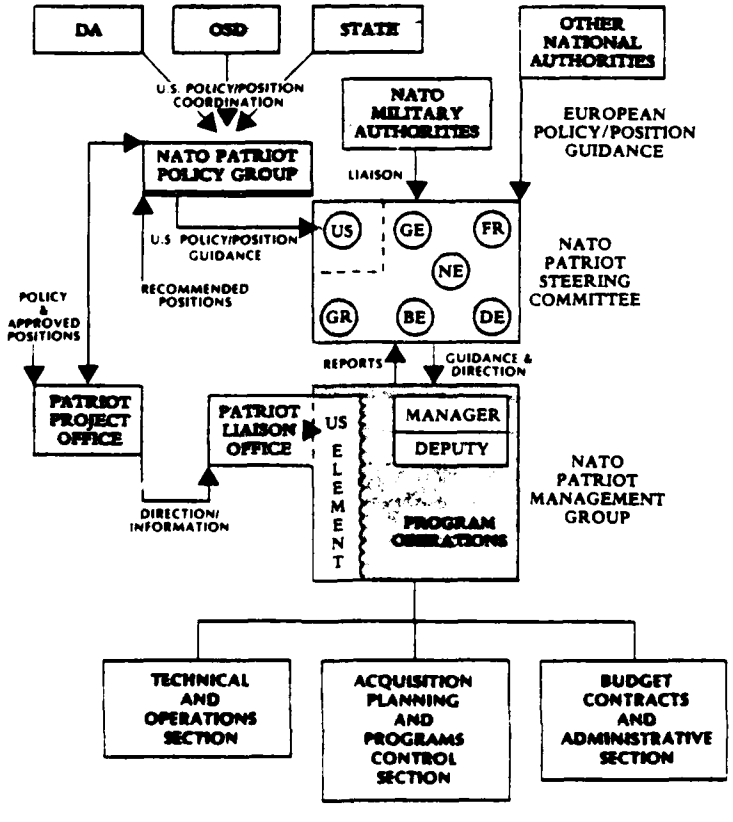
Four management structures are compared in the subsequent discussion. The PATRIOT organization represents a program in the MOU negotiation stage where discussion and negotiation are the objectives rather than program control. ROLAND represents transfer of a foreign weapons system to the U.S. with a separate U.S. ROLAND program manager tied to the European developer countries for configuration control. The NATO Airborne Early Warning and Control (AEW&C) programme represents the procurement of a major system by NATO that is owned by the 13 NATO countries participating in the program, with the U.S. System Program Office acting as the agent for NATO (France and Iceland are not participants). The F-16 program represents coproduction of a U.S.-developed system both in the U.S. and Europe by a consortium of contractors with strong U.S. management influence.

PATRIOT

Within NATO, the management organization to facilitate an international program may consist initially of a part-time NATO program steering committee and a multinational full-time management group for MOU negotiation. The steering committee controls the program by providing guidance and direction to the management group. A high-level representative from each participating NATO country sits on the steering committee. Meeting as necessary to make decisions, the committee issues regular reports about program status, and is responsible for liaison with NATO military authorities for planning integration of the system into the participating countries' inventories. Each representative to the steering committee provides his country's policy and position guidance. An initial MOU specifies the form and structure of the management group responsible for detailed management, evaluation of alternatives, and planning.

The PATRIOT organization as shown in Figure 6-1 is used as an example of program structure during the MOU negotiation. This organizational structure depicts the model for most current NATO programs, but which requires tailoring to the particular program. The structure depicted is for planning or initial concept development, and will change considerably depending upon

FIGURE 6-1. PATRIOT NATO ORGANIZATION AND RESPONSIBILITIES

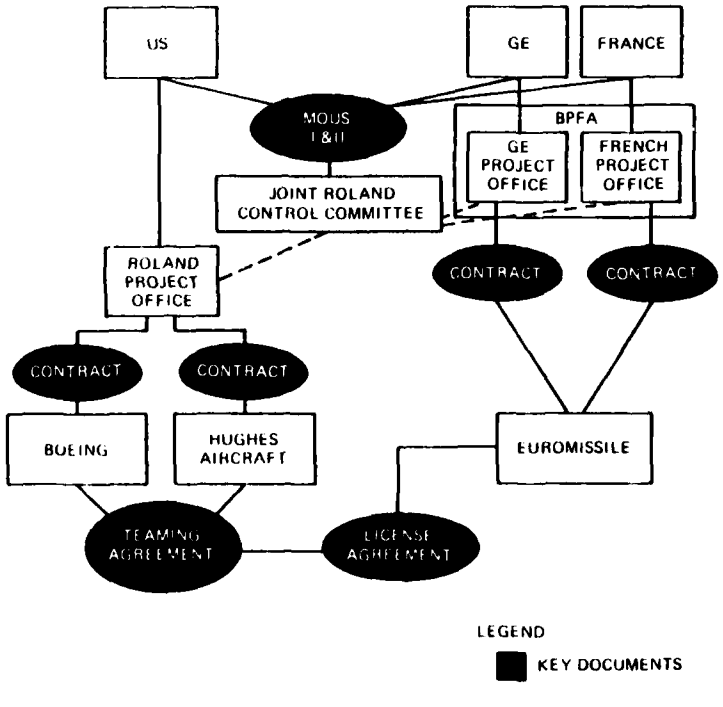


the acquisition option chosen. Different managerial organizations would, of necessity, replace entirely or expand the steering committee and/or NATO Patriot Management Office (NAPATMO) organization. For example, a consortium of government, industrial groups, or teaming arrangements in functional areas such as logistics, configuration management, operational control, and contract management may be established to implement fully the MOU for the procurement phase, and to develop future agreements in accordance with programmed actions.

ROLAND

The ROLAND program (an air defense system) was the first attempt by the United States to transfer technology of a major, foreign-developed weapon system and build it in America, while also maintaining a high degree of standardization (e.g. international interchangeability). The ROLAND was codeveloped by West German and French industry. Figure 6-2 depicts the organizational structure for ROLAND. Figures 6-3 and 6-4 next show the organizational structure used for the NATO Airborne Early Warning and Control (AEW&C) and the F-16 programs, respectively. Differences in the organizational structures are obvious.

FIGURE 6-2. ROLAND



The ROLAND program was a new experience for the U.S. Army. This fact, together with the language barrier, raised problems of coordination among the three nations and slowed program progress in the early stages. This led to the establishment of the Joint ROLAND Control Committee (JRCC), organized into six functional subcommittees dealing with simulation, configuration management, testing, training, logistics, and the threat. The number of JRCC functional subcommittees has been since reduced to four, with functions of training and testing integrated into logistics and simulation (renamed system performance), respectively. The two MOUs cover establishment and authority of the JRCC, joint consideration of improvements affecting interchangeability, rights of the countries to use improvements, and royalty agreements. The JRCC members consist of the United States program manager and the European Ministry of Defense managers for the French and German ROLAND programs. The respective members coordinate activities of their government offices and civilian contractors. Each of the three governments has provided for a permanent liaison organization to serve as the representative of the program manager to effect information exchange, coordination, and liaison.

The French and German governments have formed a joint program office, the Bureau de Programme Franco-Allemand (BPFA), which manages contracts for the Euromissile produced ROLAND. Euromissile is a joint venture between MBB (German) and Aerospatiale (French). The U.S. Government has contracted with Boeing Aerospace Company and Hughes Aircraft Company as associate contractors for technology transfer, design conversion, hardware fabrication and assembly, test, and production of the ROLAND. Boeing and Hughes have a licensing agreement with Euromissile covering the right to make or use and sell ROLAND equipment, royalties, and U.S. sales territories. During TTF&T,[1] teaming arrangement between Boeing and Hughes assigned the lead role to Hughes along with production of the missile assembly, radar, and optics. Boeing supplies the fire unit assembly, missile propulsion unit, and missile warhead.

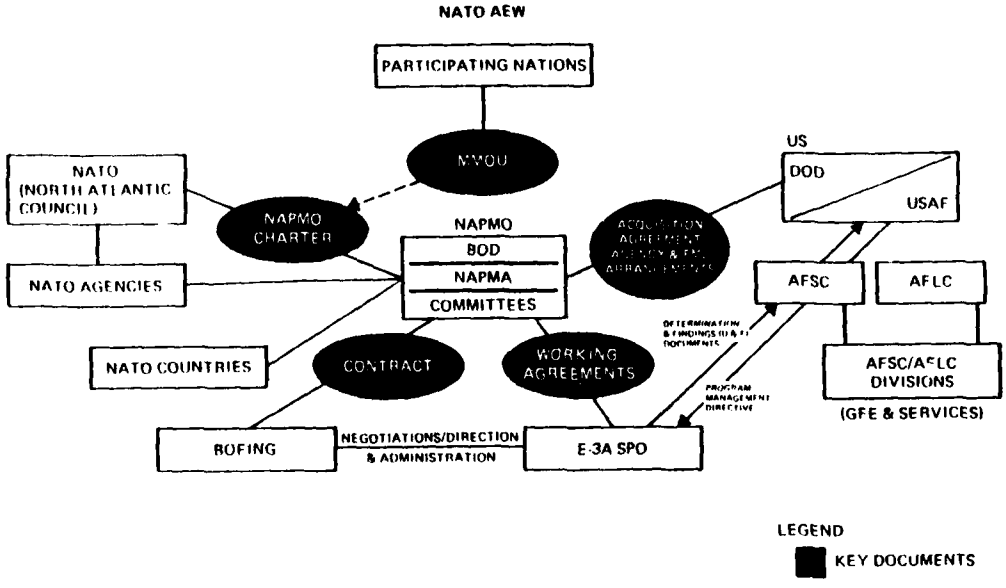
NATO Airborne Early Warning and Control (AEW&C) Programme

The NATO AEW&C programme (an airborne detection and tracking system for aircraft and maritime targets) is the largest all-NATO system. The NATO AEW&C programme has adopted the U.S. developed Airborne Warning and Control System (AWACS), designated E-3A, a derivative of the commercial Boeing 707 airframe as the air vehicle. Figure 6-3 presents the organizational structure used for the NATO AEW&C Programme.

In December 1978, the NATO defense ministers signed a multilateral MOU (MMOU) on the acquisition and cost sharing arrangement for the NATO-owned AEW&C system. The NAPMO (NATO AEW&C Programme Management Organization) was established by the North Atlantic Council with the task of assuming the direction, coordination, and execution of the acquisition program of the NATO AEW&C system, to include the development and acquisition of 18 NATO E-3A aircraft, modifications to the European ground environment, facilities construction and program administration.

[1] Technology Transfer, Fabrication and Test.

FIGURE 6-3. NATO AEW&C PROGRAMME



The NAPMO is a Board of Directors (BOD) composed of representatives of nations participating in NATO (less France and Iceland), committees to advise the BOD, and the NATO AEW&C Program Management Agency (NAPMA). The various committees are technical and configuration, legal contracts and finance, operation and support, and administration personnel and security. Currently, the general manager of the NAPMA is a German general officer and his deputy, a USAF general officer. Senior positions with the NAPMA are held by senior officers and civil servants from participating nations. The contract for the aircraft is between the NAPMO and Boeing and several other contractors not shown in Figure 6-3. Additional NAPMO responsibilities include: NATO air-defense ground-environment system modification necessary to provide data exchange and interoperability, activation of the MOB (Main Operating Base) at Geilenkirchen in Germany and other operating facilities in Northern- and Southern-flank nations, construction of maintenance and repair facilities at the MOB, and establishment of a NATO training center to assist the multinational force of 2,400 people that will operate and maintain the NATO E-3A.

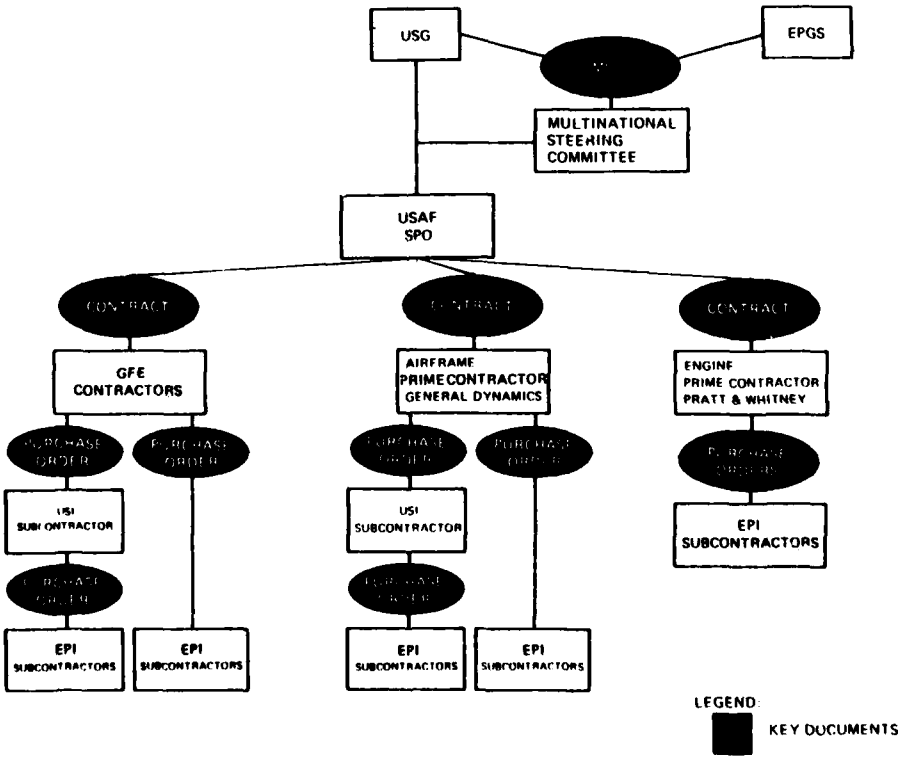
The United States Air Force acts as general agent for the NAPMO through HQ USAF, Air Force Systems Command (AFSC) and Air Force Logistics Command (AFLC) to the NATO E-3A System Program Office (SPO) and other AFSC/AFLC divisions, to procure and manage contracts for aircraft, engine peculiar spares, and related support services per an acquisition agreement. Foreign military sales (FMS) arrangements provide for U.S. Government support, government-furnished equipment and services, and common spares. Working agreements are in place between the NAPMO and the E-3A SPO for the SPO to conduct contract negotiations, direction, and administration. This agreement requires NAPMO to retain funding responsibilities, make payments in the national currencies, retain liability for all costs and stop-work orders, protect U.S. Government security requirements, and approve changes.

F-16 Aircraft Program

The F-16 program (a combat fighter) was the product of intense competition between the YF-16 (U.S.), YF-17 (U.S.), Mirage F1E (FR), and the Viggen (Swed). The U.S. Government (USG) and the European Participating Governments (EPG) nations: Belgium, Denmark, the Netherlands, and Norway, have agreed in a MOU to coproduce the F-16 with a 58 percent offset of the procurement value of the initial U.S. and European purchase (348 aircraft) to the EPG, with further offsets for third-country sales. Technology transfer to the European partners for production of the F-16 is a stated goal in the MOU.

The USG assumes program management responsibility for the multinational F-16 program. A Multinational Steering Committee serves as an advisory body for the F-16 program, with each member nation providing one representative and one alternate. The U.S. System Program Director manages the contracts, with the largest two U.S. prime contractors being General Dynamics and Pratt & Whitney. The U.S. primes, with the U.S. Air Force, have responsibility under the contract to provide for the offset through purchase orders and technology transfer for airframe and engine fabrication and assembly to European participating industry (EPI). Figure 6-4 shows this F-16 organizational structure.

FIGURE 6-4. F-16



Foreign Military Sales

Another organizational approach normally utilized in foreign military sales (FMS) is to have a program office in the United States with a division or field office located in-country, especially for direct lines of communication with the customer government or business. The program office in the United States, however, is responsible for development, production, qualification, configuration control, delivery of equipment, and follow-on support. The in-country field office may be responsible for establishing a training and logistics system.

SPECIAL OPERATIONAL CONSIDERATIONS

The following depicts how some of the operational considerations and policy factors can impact or influence the way a multinational PM office is tailored. Operational considerations are:

- Service Peculiar Organizational Traits. Traditionally, the Services organize PM offices differently.

- Major Program Changes/Configuration Management. Major changes in program direction or design will, in all likelihood, necessitate organizational changes, something for which the PM must be constantly alert.

- Type/Nature/Extent of Cooperative Effort. The degree and level of cooperation between nations must receive consideration during the tailoring process, with high levels of participation requiring a correspondingly high level of representation.

- Phase of the Program. For example, early-on, the program office may require more technical and engineering staff, while in a mature program, it would call for more Integrated Logistics Support (ILS) and production staff.

Other operational considerations include:

- The Technical Management Process and Controls. The approach to the technical management of the program could dictate the special skills required for staffing the PM office.

- The Financial Management Process and Controls. The more nations involved, the greater the overall financial management problem will be -- compounded by varying exchange rates, balance of trade, and the like -- hence, the greater the need for specialized financial staff.

- The Government/Industry Roles and Participation. The roles, relationships and degrees of participation by both the government and industry could have significant influence on how the multinational PM office is structured. A private contractor with extensive contacts and experience in the international market place will require less specialized attention on the part of the PM than a contractor that has not had that experience. We will look later in the chapter at how some contractors have structured their PMOs for multinational programs.

- The Structure of Non-U.S. PMOs and Their Modus Operandi. The U.S. PM, when tailoring his office, must give careful consideration to how the participating allied nations have organized their effort to accomplish the program. How participating allies operate can also have impact on the U.S. PM organization.

SYSTEM PROGRAM OFFICE ORGANIZATION

There are two basic alternatives for program office organization. One is to include on the program management staff all functional specialists needed for program execution, essentially establishing a self-contained organization. The other is to restrict the program management staff to a cadre of managers who draw functional support from the parent organization. This latter is commonly called a matrix organization. Most program management organizations are neither completely self-contained nor completely matrix, but a mixture of the two. Large, high-priority programs, especially in the Air Force and to a lesser degree in the Navy, tend more toward the self-contained program office organization. Small, low-priority programs in all Services tend more toward the matrix type.

Multinational programs normally follow the organization practice of the lead Service, but require a larger, more experienced staff than a national program. Moreover, in a jointly staffed program office, it is normally desirable to include on the program management staff as much functional expertise as practicable. Supporting a joint program that has the active participation of two or more countries is an extraordinary task. It is time consuming. In addition, it requires 6-8 months for an individual who is knowledgeable in his own Service's procedures to adapt to the multinational environment. Many of the Services' normal procedures must be modified or abandoned in favor of procedures better suited to the program's needs. A functional specialist who is assigned full-time to the program management staff is more likely to share fully in the spirit and objectives of the program and to cling less fervently to Service-peculiar procedures than is one who is working part-time for the program.

An analysis of the requirements for contracting and contracts administration, engineering, quality assurance, test and evaluation, and administration of the program provides the PM with a basis for identifying personnel and staffing needs. Although each U.S. Service approaches the organization of the PM office somewhat differently, they generally agree on having a "core" of functional staff in the areas of Program and Resources Management, Procurement and Production, Technical Management, Quality or Product Assurance, Financial and Contract Administration, and Logistics Management or Integrated Logistics Support (ILS). The need for supplementing this core functional staff with RSI experts, liaison officers, administrative people, contractor representatives, field office personnel, legal advisors, translators and the like is very real.

The Program Management organizational structure exists to provide a disciplined, stable, but flexible approach to dealing with legal, administrative, and technical requirements of the acquisition process. When operating in the international arena, the organization is complicated by the introduction of many new factors -- laws, language, protocols, customs, monetary differences, measurement standards, management techniques, to name a few -- which are often unfamiliar and may require special staffing.

A complicating factor in the organization of a multinationally-staffed program office is the assignment of responsibilities to personnel from the participating countries. The fact that the program office is jointly staffed is evidence of the participating countries' desires to influence the program. However, it should be clear from the organization of the program office, as well as stated in the charter, that the participating countries' representatives share responsibility for success of the joint program; they are not merely representing their countries' interests. To accomplish this purpose, the joint program manager should organize his staff and allocate key positions among the countries such that a balance of responsibility, authority, and influence is maintained. The senior representatives from the participating countries must be in the chain of command, directly subordinate to the program manager. Sometimes this may require creating one or more positions for principal deputy program manager. Creating extra positions is preferable to rotating one position among the participating countries or to slighting the interests of one by subordinating its representative.

When a program office requires multinational staffing, each of the country's responsibilities for providing personnel should be delineated in the Weapons-Specific MOU. The MOU should state the numbers and grades of personnel to be provided by each country, their specialties, whether they are to be military or civilian, and the minimum duration of their assignments. The Weapons-Specific MOU should also specify a target date for complete staffing of the office, but keep in mind that filling an approved billet, especially a civilian one, may take from 6-12 months.

PERSONNEL

Selection

One of the multinational program manager's greatest challenges is creating an esprit de corps within the program office. Situations are bound to arise in which the countries' interests conflict. Success of the program then depends on having program management staff personnel who are committed to resolving the problems, rather than provoking confrontations. Representatives from the participating countries must be expected to guard their countries' interests; that is why they are assigned to the program office. But their attitude and approach must be dedicated to success of the program.

The multinational program manager wants on his staff the same type people who are desirable for every staff: knowledgeable, hard-working, efficient, and loyal. More than others, however, the joint program manager needs people who can work well with each other and who are willing to explore unique solutions to management problems. The multinational program staff must be creative, flexible, and determined.

Selection of the deputy program managers, especially those from the participating countries, is particularly important to the multinational program manager. Not only must he have confidence in the abilities of his deputies, he must be able to develop a good working relationship with them. Personality conflicts, even among people who otherwise are competent, can undermine a multinational program. Before accepting assignment of key personnel, the program manager should interview them, discuss program objectives, management approach, and management philosophy, and satisfy himself that each will become part of a good management team.

Evaluation

As a general rule, each person's performance should be evaluated by his supervisor. In multinational programs, this rule can be followed for most personnel. The common exception is for military officers assigned by a participating country to a jointly staffed program office. It is normally considered important to an officer's career for his performance to be evaluated by an officer of his own country and Service. Therefore, in a jointly staffed program office, the participating countries' senior representatives should be responsible for evaluating the performance of officers from their country. The program manager, however, should always evaluate the performance of the participating countries' senior representatives, even if they are evaluated also by the participating country.

U.S. CONTRACTOR MULTINATIONAL PROGRAM MANAGEMENT ORGANIZATION

The same basic organizational alternatives -- functional and matrix -- are also employed by industry. Most are neither self-contained nor completely matrix, but a mixture of the two. Some contractors tend to "shadow" or mirror-image the government's PM organization, while others organize differently, often along the lines that have proven successful for them in past programs. Basic to any private PM organization, you will find some element of Marketing (or Sales), Engineering (or Manufacturing) and Budget (or Finance).

The Contractor plays an important and key role in the development and acquisition phases of the multinational program management system. He must have the organizational flexibility that tailoring can provide. For example, in the F-16 multinational program, General Dynamics, with no prior experience abroad, has had one of the most complex and frustrating managerial tasks of any defense contractor. Under a unique arrangement, the fighter is being produced simultaneously on both sides of the Atlantic. General Dynamics has had to overcome differing philosophical approaches to management by foreign governments and businessmen, and to improvise entirely new ways of doing things because of the project's enormous scope. Through a determined effort and strong management, they have persevered.

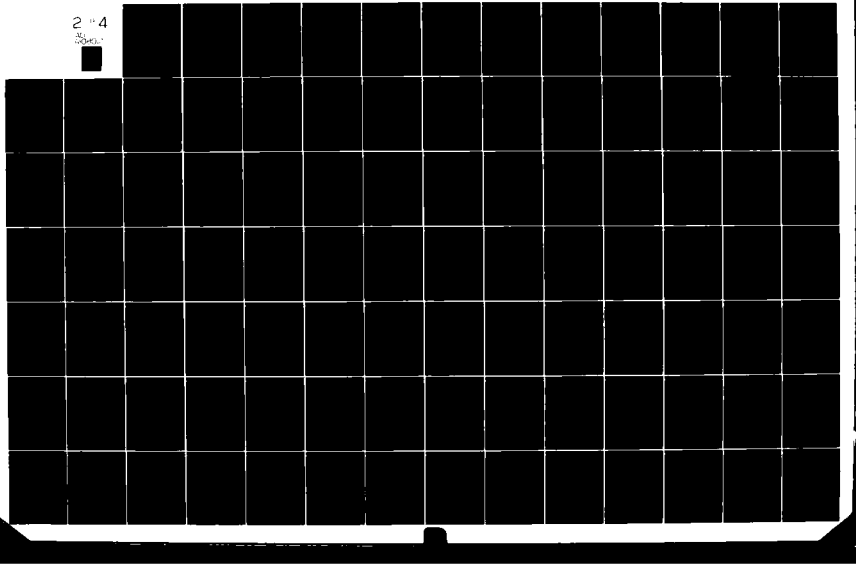
THE ROLE OF THE MULTINATIONAL PROGRAM MANAGEMENT CHARTER

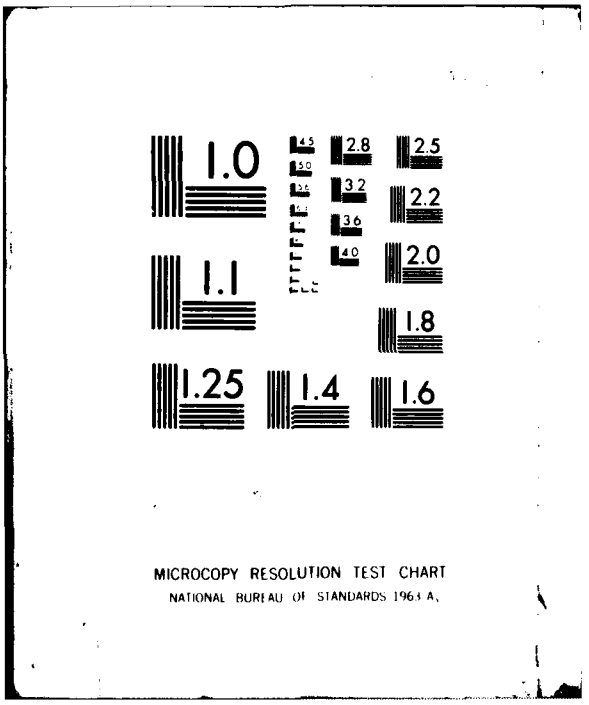
The Charter (term used by U.S. Army & Navy) or Program Management Directive (PMD) (U.S. Air Force term) is the instrument which identifies the mission, responsibilities, authority and the special instructions for the U.S. Program Manager in order to facilitate the development and acquisition of a specified system. It is normally prepared and staffed by the PM while he is organizing his office. A similar document is applicable to multinational PMOs.

Usually contained therein is the following:

- The Purpose of the Charter
- The Designation of the PM (by name)
- References

AD-A108 017 LOGISTICS MANAGEMENT INST WASHINGTON DC F/G 15/5
JOINT LOGISTICS COMMANDERS GUIDE FOR THE MANAGEMENT OF MULTINAT--ETC(U)
JUL 81 J S FARGHER, W A GEISLER MDA903-77-C-0370
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MICROCOPY RESOLUTION TEST CHART
NATIONAL BUREAU OF STANDARDS 1963 A

- The Mission
- The Charter Authority and Responsibility
- RSI Requirements
- Resource Control
- Chain of Command
- Communications Channels
- Location and Supporting Organizations
- Test & Evaluation
- Logistics
- Implementing Instructions
- Program Termination or Disestablishment
- Other Details

A clear and concise charter can be an effective working document. It charts out the course of the multinational program manager and serves as a vehicle for implementing the directions contained in the multinational MOU, international coordinating papers, DoD and Service directives and regulations and the like.

7. CONTRACT MANAGEMENT

INTRODUCTION

It is clear that the intent of the Congress and the Executive Branch is to foster RSI by permitting foreign competition into the DoD marketplace so that the U.S. Military Departments procure weapon systems or components of other NATO nations' design so long as these (a) meet a need that is not met by an existing U.S. system or development; or (b) can meet a need competitively with a U.S. system or development on the basis of technical performance, life cycle cost and availability; or (c) are part of a joint effort in development and production with the U.S. and lead to a common selection.

Achieving these objectives requires that the program manager define an acquisition strategy that will allow for a level of involvement by NATO sources which is appropriate for the specific program. Since there is a great variety in potential program structures in the multinational environment, specific attention must be directed to contracting approaches during the early program planning.

We should note at the outset of this discussion that much of the DoD contracting procedure has its roots in public law and that the growth of laws covering this function has resulted in a complex yet often rigidly prescribed set of procedures. It is very important that the Program Manager obtain early involvement from the Contracting Officer assigned to the program. Appointment as a Contracting Officer is made based upon specific qualifications of a person covering contracting law and procedures, business judgment and experience. His counsel and advice during preparation and execution of acquisition plans can assure that contracting plans are attainable and realistic within the scope of the overall program objectives.

Multinational Program Manager sensitivity to contract management considerations is essential to the successful achievement of the goals and concepts discussed in Chapter 5 on Acquisition Strategy. These contractual considerations can have broad program management impact and can exert fundamental influence on the success of the foreign acquisition process. How does the program manager select from the myriad of contracting approaches available to achieve program objectives? What legal relationships are involved? How can contract management affirmatively support program manager objectives? This chapter will focus on these issues and the significant elements in multinational programs which affect contract management. Contracting issues emanating both from regulatory procedures and constraints as well as the results of experience gained in multinational programs will be presented. This information should provide a basis for program manager sensitivity to contract management issues in the multinational acquisition environment. The chapter also contains a section on the important General Agreement on Tariffs and Trade (GATT) which was implemented by Congressional Act in January, 1981. The effect of the Act is to expand the range of competitive procurements in the U.S. available to foreign contractors, as well as to make foreign markets more open to U.S. industry.

NATO RSI CONTRACTING ENVIRONMENT

As discussed earlier in Chapter 5, Foxcurran has categorized eight modes of NATO/RSI systems development at the transnational level as follows:

	Mode	Program
1.	Licensed production of a U.S. developed system in one European nation.	M-113 CH-47 Noratlas F-5 CH-53
2.	Licensed production in Europe by a multinational consortium of a system developed in the U.S.	Hawk F-104G Bullpup Sidewinder
3.	Joint development and production among nations.	Transall Martel MRCA Alpha Jet Milan Roland ASSM
4.	Licensed production in the U.S. of a system developed in Europe.	B-57 MK-87 RATAC Roland Harrier
5.	Transatlantic joint development.	MBT-70 AVS Fighter Mallard NATO PHM Seasparrow
6.	Bilateral offset arrangements.	F-5 MAG 58 Improved Hawk CH-47 F-4 F-111
7.	Transatlantic joint production and/or systems management by a U.S. led consortium.	Helip F-16 AEW&C
8.	Family of Weapons concept.	AMRAAM/ASRAAM ATGM

These modes are evolutionary in nature. Until very recently, by far the greater amount of activity has been in those business categories wherein U.S. technology and corresponding systems have migrated eastward across the Atlantic. Increasingly, emphasis is being directed toward providing a measure of parity relative to the procurement of systems from the NATO European members.

Licensed production in the U.S. of a system developed in Europe (Mode #4), for example, has been a very narrow street as opposed to the considerable flow of goods to NATO partners (Modes #1 and #2) in the past. With U.S. foreign military sales to all nations hovering at approximately 12 billion dollars and a total market estimated at nearly 40 billion dollars, emphasis recently has been directed at those arrangements providing for a share of the work effort to be performed in the country buying the weapons system (Modes #6 and #7). Because of the unwieldy nature of conducting business in these modes, which are essentially government-to-government relationships, one approach followed has been to harmonize procurement requirements as an integral part of the Family of Weapons system concept (Mode #8).

Many factors are responsible for the evolution of the Family of Weapons system concept. The philosophy inherent in this approach has evolved from the Modes #6 and #7 barter-type arrangements consisting of offset agreements and joint project ventures featuring consortia of firms, including the corresponding governments.

It is well to recognize throughout this discussion that RSI program objectives from a contract management standpoint can be viewed in terms of transnational ventures. These ventures involve the alignment of procuring governments and their industrial counterparts, contractors or consortia thereof. This buyer-seller relationship can be viewed three ways: government and consortia, intra-consortia, and intra-country. These relationships may be constraints to successful program management or a source of potential conflict of interest. This is especially true since defense acquisition strategy and attendant contract management relationships may be considered instruments of national economic development policies. This interaction is described in Chapter 4 on the European Environment Overview. Each of the NATO contracting environments is unique. Thus, it is necessary for the Program Manager and the supporting Contracting Officer to understand clearly the specific rules and contracting customs in the particular participating countries.

This understanding of the country unique requirements is especially significant since European NATO governments and industries appear to prefer that the U.S. Government contract directly with European industries rather than with European governments in an FMS-type of arrangement. The Europeans really don't have FMS-type procedures. Exceptions, however, include programs such as RAPIER, where the U.K. government must be involved because of support arrangements. As a contrast, the U.S. normally channels its industry military exports to NATO Europe through the U.S. Government. The variation in approach results from differences in European and American procurement policies and practices that may impact on the Program Manager's ability to promote smooth and economical cooperation in military R&D and production with NATO allies.

One difference between U.S. and European procurement practices that is likely to impact on the ability of the program manager to promote international cooperation in military R&D and production for RSI is that U.S. procurement regulations are typically more highly detailed in specific statutory requirements than are European ones. A recent study entitled "NATO Standardization and Defense Procurement Statutes" by the Library of Congress, Congressional Research Service, suggests that many of these U.S. statutory requirements give rise to "boiler plate" clauses in U.S. contracts that are unfamiliar to Europeans or represent requirements with which the Europeans could not or would not comply. The contracting staff of a PM should contact the U.S. Army Contracting Agency, Europe, Box 49, APO New York 09710, in case it wishes current information on the so-called boiler plate content to be included in DoD contracts with European companies.

Although the European industrial base is fragmented and much smaller (vis-a-vis the U.S. market), and is developing along cooperative (i.e., consortia), as opposed to integrative lines (i.e., merger), it is important not to take a static view of the situation. A 1977 study of Western Europe's aerospace industry by Euro Economics (an economic research organization) concluded that, although collectively still much smaller than the U.S. industry -- 1976 European sales equaling 38% of U.S. sales compared with 19% in 1970 and 13% in 1960 -- it is not lagging behind in global competition or financial performance nearly to the extent popularly felt. The report states that the statistical record stands at odds with generally pessimistic European assessments. This may be due to the European viewpoint of focusing only on particular markets (sales of commercial transports) or isolated problem areas (the need for greater coordination of national procurement policies). Since the study was published, even those two areas of concern have been somewhat modified as evidenced by the Eastern Airlines purchase of the A-300 Airbus and the 1977 record-breaking export performance of the French and UK aerospace industries of around $5 billion and $2 billion new export orders, respectively. In this regard, French aerospace sales in 1980 were expected to reach $7 billion![1] In addition to implications for NATO standardization efforts, this development is also important as U.S. foreign military sales decrease, and new concepts such as the Family of Weapons Systems emerge.

In parallel with the continued development of European defense/aerospace industries, a new form of business organization and management has developed in Europe. This involves both business and government centered around an entity previously mentioned as the transnational venture. This new management approach has grown out of the unique circumstances of Europe, and the cooperative lines the industrial evolution has taken. Meanwhile, U.S. industry has been dealing primarily within one large integrated defense market created by the U.S. Government. When U.S. firms venture outside this national market, it is generally for direct sales or as a licensor. The U.S. is aware of this evolution in Europe and has been moving over the last five years toward a bridging of the gap. This has and will continue to involve the increased participation of U.S. firms in industrial collaboration through joint development projects, manufacturing as licensee for European developed systems, and the continued assorted production offsets and coproduction of U.S. developed systems.

[1] Wall Street Journal, 19 November 1980, p.1.

The current Family of Weapons concepts represents a significant policy thrust towards greater collaboration. In the past, U.S. efforts at collaboration were primarily targeted towards obtaining those developed European systems which basically satisfied a military requirement for operational hardware in less time or at lower cost than would be expected from the normal R&D cycle. This change can be seen in reviewing appropriate portions of the DAR. Today, foreign firms from qualified countries may have equal competitive standing with U.S. firms except for certain restrictions such as National Security needs and mobilization planning requirements. Moreover, U.S. prime contractors are required to consider qualified country sources competing for the considerable subcontract dollar share of U.S. defense business.

Identification as a qualified country carries important waiver and solicitation characteristics. In the area of solicitations, aside from statutory restrictions, identification as a qualified country simply means access to the U.S. defense market with country classification as to type agreement -- participating, FMS/offset, and defense cooperation. Thus, the Department of Defense along with allies and NATO nations, in particular, is expanding the collaborative arrangements for the research, development, production, and support of complex weapons systems in furtherance of standardized objectives.

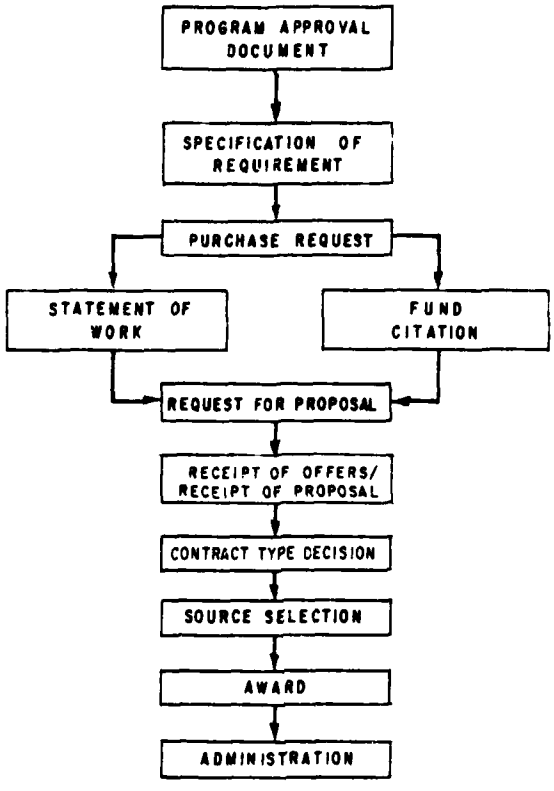
With this background, some specific observations concerning the contract management challenges facing the program manager in dealing with U.S./ qualified country firms will next be presented.

CONTRACTING PROCESS

Some of the problems and differences in approach which will affect a NATO involved program may be highlighted through reference to the contracting sequence shown in Figure 7-1. The contracting process is based upon and initiated by receipt of a program approval document. These documents are normally well-defined for purely U.S. acquisitions. For NATO involved programs, the form of the program approval document will depend upon the mode of acquisition strategy employed. The process for the development and approval of these documents, particularly Memoranda of Understanding (MOUs), is described in Chapter 2 on Major RSI Approaches and can be a long drawn-out effort. Often these documents will contain qualifications or reservations on the commitment level of both the U.S. and the NATO participants. The program manager needs to insure that the acquisition strategy and contracting approach reflect the various objectives, restrictions and constraints specified in these formal government-to-government arrangements.

The second major element is the specification of the requirement. This document is an output of the requirements planning harmonization process described in Chapter 3 on RSI Planning Systems. Some difficulties arise in the process of communication of the requirement due to differences in language and syntax. The objective from the contracting standpoint is to get a clear expression of the requirement which can then be communicated to potential sources. Where there are specific business requirements, such as a defined distribution of program purchase dollars among countries or directed sources for certain portions of the equipment, these must be clearly specified.

FIGURE 7-1. CONTRACTING SEQUENCE



The purchase request combines the statement of work and the fund citation. The statement of work communicates what the contractor is to do in meeting the requirements of the proposed contract. It needs to reflect both the unique efforts required to provide the required hardware (including such elements as international standardization) as well as to meet the economic participation (e.g. offset) requirements, if any. If NATO standards are to be used in place of U.S. standards, these also must be identified. The statement of work must accurately reflect the requirements of the MOU or other authorizing document in terms of business structures.

The fund citation can be expected to contain constraints covering such things as:

1. level and timing of national contributions,

2. provisions on currency exchange, and

3. incremental funding plan.

The financial constraints and government commitment must be communicated to the potential offerers so that they are aware of the level of risks inherent in the acquisition.

The document providing the mechanism for industry participation is the Request for Proposal (RFP). The RFP must communicate the requirement in a clear and understandable fashion. Some elements which may need to be described specifically in the RFP are:

1. Identity and definition of RSI program objectives,

2. Relative importance of RSI goals,

3. Acceptable design trade-offs between RSI objectives and cost,

4. Specific legal basis for interpretation of terms and adjudication of differences,

5. Any requirement for offsets, and

6. Requirements for data disclosure.

The Uniform Contract Format described in the DAR is an excellent structure for the RFP and the resulting contract, but there is still a need for careful drafting of RFP provisions to overcome differences in language, business approach and conceptual understanding among the potential participants. Contract type is usually negotiable until the source selection is made.

The standard "boilerplate" provisions normally included by reference in U.S. acquisitions need to be analyzed for applicability and acceptability by the foreign sources. As noted elsewhere in this chapter, many of the standard U.S. contract provisions are viewed by European industry and governments as unacceptable intrusions. Reference should be made to the MOUs signed with the potential participants to determine which, if any, of the "mandatory" DAR clauses have been waived. For the clauses which are to be used, the U.S. European Command supplement to the DAR includes many general provisions which have been "Europeanized." Those provisions which require flow down to subcontractors may cause delay due to disagreement over language. In this regard, the provisions of the governing MOU may provide guidance or emphasis on the approach to flow down of provisions.

While it is the responsibility of foreign sources to make themselves aware of contracting opportunities available from DoD, the program manager/contracting officer is encouraged to make public announcement of the solicitation and to host presolicitation conferences to help identify qualified sources, both foreign and domestic. The DAR requires publication of all contemplated acquisitions in the Commerce Business Daily. In this regard, it is DoD policy that offset acquisitions overseas normally will be competitive. The items acquired must satisfy DoD requirements fully as to performance, quality and delivery schedule, and shall cost DoD no more than would comparable items of other manufacturers which are eligible for award. If unusual technical or security requirements would preclude the acquisition of otherwise acceptable defense equipment from participating country sources, the need for such requirements should be specifically reviewed. In some cases, it may also be appropriate to consummate agreements covering payment for costs incurred by foreign sources in developing proposals. This may overcome their reluctance to release data to potential U.S. collaborators prior to licensing agreements being consummated. The MOU may contain specific procedures for or constraints on the solicitation process.

Normally, a U.S.-managed acquisition will follow the basic solicitation and source selection process of the managing Service. On NATO programs, there are a number of issues which must be specifically addressed in the Source Selection Plan:

1. What non-U.S. input to the source selection team will be obtained and how will it be integrated into the evaluation process?

2. How will technical competence and capability and price realism be evaluated for the foreign content?

3. What is an appropriate evaluation/decision schedule based upon the expected complexity of the proposals?

4. How will U.S. pricing policies from the DAR be applied or will there be any deviations?

It is important to note that each proposal received may reflect both a different product (the solution for the requirement) and a different business structure. The evaluation procedure needs to be able to reflect the importance of those business structure elements which may bear on the success of the U.S. in achieving goals established in the MOU.

As the acquisition process continues toward award, there are normally a series of negotiations which take place. During contractual negotiations, the general guidance on negotiation with foreign entities, as discussed in Chapter 15 on Communication and Information, is significant. For the specific case of contract negotiation, it is also important to make allowance for support in the form of assistance (including audits) from the government of the foreign offerer. Where foreign contractors or subcontractors are to be involved, there needs to be advance agreement between the U.S. and the involved foreign governments covering the audit of foreign contract proposals. Questions which need to be answered include such issues as what the U.S. audit agencies will be allowed to audit, who is going to do the audits, how much participation by U.S. audit agencies will be allowed in foreign audits and what information is needed by foreign audit agencies if they are to perform this service. Failure to clarify these issues was cited by the F-16 program as a potential impact on the award of contracts and therefore on the delivery schedules and cost. There also needs to be a recognition that the subcontractor structure may not be as clearly specified as in a purely U.S. acquisition since NATO sources may be unwilling to make a full commitment prior to the award of the contract.

Special emphasis needs to be given to the disputes and change procedures in DoD contracts. Issues of jurisdiction and appeal require expert legal counsel and the program manager should make maximum use of the experience gained by DoD attorneys in previous multinational programs. It is critical that all the parties to the contract have a complete and similar understanding of all the terms and conditions of the contract to preclude future noncompliance or misinterpretation of the requirements.

There are a number of options available to the Procurement Contracting Officer for administration of the contract after award. For the U.S. sources, administration is accomplished by the Contract Administration Service (CAS)

office identified in DoD Directory of Contract Administration Services Component (DoD 4105.59H). Where foreign sources are involved, the administration can be assigned to:

1. the CAS service of the specific nation (if the nation involved has signed a Contract Administration Annex to the General Reciprocal MOU, which has happened with most of our NATO allies).

2. the U.S. CAS assigned to that area, or

3. a separately constituted organization such as the CASEUR office established for the F-16 program.

Where the U.S. program office determines that in-plant verification of foreign prime or subcontractor performance is required, the Program Manager needs to evaluate the nature of the government contract administration activity performed by the foreign country. The F-16 SPO found this was highly variable on a country-to-country basis. It may be necessary to collocate U.S. Government contract administration personnel at those facilities which produce critical components of the weapon system under development to provide acceptable visibility of prime and subcontractor conformance to contractual requirements. In addition, the interface and relative responsibilities of the PM office and the CAS office need to be specifically defined. Each of the approaches to administration has benefits and the choice should be made in consultation with the Contracting Officer as an element of the contracting staff. Chapter 10 on Financial Management provides more details on the audit process for international programs required to satisfy U.S. standards.

There are a number of general areas which have specific impact on contracting in the multinational environment. The balance of this chapter will outline these areas and some of their impacts on the program manager's flexibility in achieving the program objective.

THE DEFENSE ACQUISITION REGULATION (DAR)

The DAR establishes uniform contracting policies and procedures for the acquisition of supplies and services by the Department of Defense. While the elements of contract law permeate the contract environment, specific contract management considerations involving contract principles, accounting, pricing, finance, subcontracting, terminations and contract administration are spelled out in the DAR itself. In accounting, for example, DAR Section XV (Contract Cost Principles) contains over 20,000 words of detailed guidance on the treatment of costs such as advertising, bid and proposal, depreciation, etc. for use in evaluating contractor's proposals -- whether from domestic or foreign firms -- as well as negotiating change order costs subsequent to award. Additionally, the very complex area of Cost Accounting Standards, DAR Appendix 0, which in itself is a subset of accounting, interfaces with these cost principles and contains over 80,000 words. This considerable body of guidance and direction must be considered in dealing with RSI contract management issues

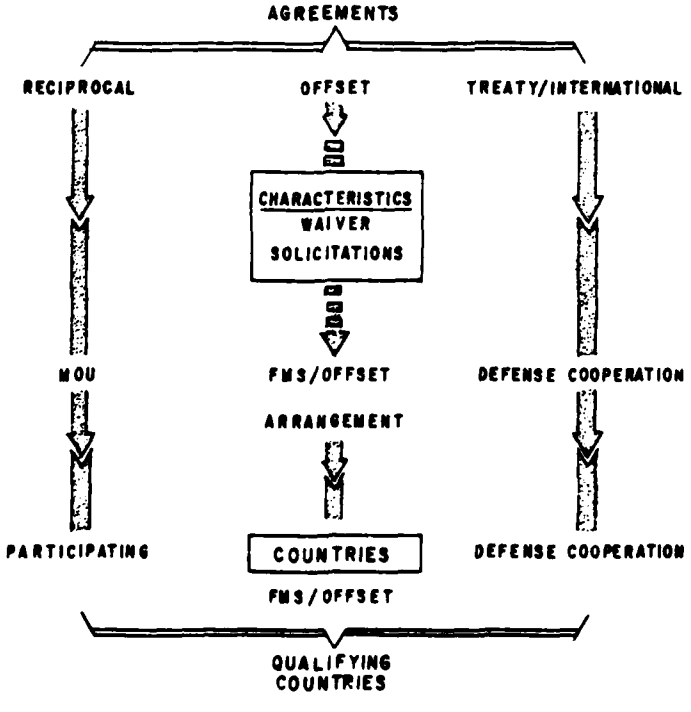
DAR on Foreign Acquisition

DAR, Section VI, Foreign Acquisitions is of particular interest to the program manager. Defense Acquisition Circular (DAC) 76-25, 31 October 1980, completely revised Section VI so that it now incorporates the acquisition objectives and initiatives of the U.S. Government in the RSI arena. The following discussion will provide an outline of this revision as well as treatment of areas which may be of specific interest to the program manager of a multinational effort.

Foreign acquisition can be defined as the acquisition of defense equipment from foreign sources for use by U.S. forces. Foreign acquisition and the term "offshore procurement" are often used interchangeably. However, offshore procurement can be defined as the acquisition of products from foreign countries for consumption by U.S. forces in foreign countries. In other words, offshore procurement means items purchased outside the U.S. for use outside the U.S. This chapter limits the term "offshore procurement" to this concept.

As shown in Figure 7-2, there are 3 types of international agreements which apply to foreign acquisition: reciprocal agreements, FMS/offsets agreements, and treaty/international agreements.

FIGURE 7-2. FOREIGN AGREEMENTS CLASSIFICATION



Reciprocal agreements encompass any NATO country which has an MOU or similar agreement with the U.S. These countries are identified as participating countries and are covered by a blanket Secretary of Defense Determination and Finding waiving Buy American Act restrictions. Offset agreements are identified as any foreign country having an offset arrangement negotiated in conjunction with a Foreign Military Sale and which arrangement provides for obtaining a waiver of Buy American Act restrictions on a case-by-case basis. Lastly, treaty/international agreements cover those foreign countries having a defense cooperation agreement, such as Israel or Egypt, and for which a Determination and Finding has been made by the Secretary of Defense waiving Buy American Act restrictions for a list of mutually agreed items. These types of countries are extremely important relative to contracting policy since they define the population of what is now termed "qualified countries," as discussed earlier on page 7-5. Chapter 2 on Major RSI Approaches contains more details on these agreements and MOUs.

With this background, let us review the pertinent DAR Section VI regulatory coverage areas shown on Figure 7-3.

FIGURE 7-3. DAR SECTION VI

FOREIGN ACQUISITION REGULATORY COVERAGE

- BUY AMERICAN ACT
- APPROPRIATIONS ACT
- CANADIAN PURCHASES
- DUTY & CUSTOMS
- MILITARY ASSISTANCE PROGRAM
- BALANCE OF PAYMENTS
- INTERNATIONAL AGREEMENTS
- EXAMINATION OF RECORDS
- FOREIGN MILITARY SALES
- (NATO) PARTICIPATING COUNTRIES
- DEFENSE COOPERATION COUNTRIES

These eleven areas incorporate for use contractually by contracting officers the agreements entered into between the United States and other nations, particularly NATO countries. The fundamental characteristics of these agreements with respect to the acquisition of defense equipment from foreign nations anticipate the forbearance of U.S. "buy-national" laws and specifically include waiver of the Buy American Act, as well as the promise to solicit for defense products from those countries. As currently structured, DAR Section VI now applies to the acquisition of weapons systems and spare parts for supply system inventory as well as supporting U.S. military forces in foreign countries.

The Program Manager will recognize that any particular project may have considerably different relationships or that certain portions of a project such as those involving sensitive types of equipment may follow government-to-government guidelines. However, whenever purely contractual matters are involved, our basic model clearly portrays current acquisition policy as embodied in the DAR. Additionally, it should be noted that the

concept is embryonic and several concerns have been voiced. What numbers and types of foreign firms will be found on the various defense agency Bidders' Mailing Lists? What dollar value of awards will flow to foreign firms? What effect will relaxing of "buy national" or "socio-economic" laws for foreign firms have on their price competitiveness relative to U.S. firms? The following discussion of individual areas, several of which are listed in Figure 7-3, will not answer fully these questions, but, rather, suggest the type of impact that they may have on program strategy.

Buy American Act. The Buy American Act (41 U.S.C. 10a-d) provides that the government give preference to domestic source end-items. These products are defined as an unmanufactured "end product" (further defined as articles, materials, and supplies that are to be acquired for public use as deliverable per the contract) mined or produced in the U.S. or an end product manufactured in the U.S. if the cost of its qualifying country components and its components which are mined, produced, or manufactured in the U.S. exceeds 50 percent of the cost of all its components. Obviously, this definition highlights the importance of classification as a qualifying country, and just as significantly, perhaps, implies the possibility of teaming arrangements between U.S. and foreign firms to fall within the scope of the revised Buy American coverage.

At the time this guide was prepared, the requirements of the Buy American Act had been waived for all NATO countries except Iceland, Luxembourg and Greece (waiver pending). The intent of the DAR is to provide to sources in the NATO countries (and other particpating countries) the opportunity to compete on a fair and equal basis with U.S. industry for R&D and production contracts. The only major restrictions are those involved with 1) U.S. defense mobilization base requirements, 2) specific U.S. laws and regulations (i.e., the annual DoD Appropriations Act), 3) the provisions of the National Disclosure Policy, and 4) U.S. Industrial Security Requirements. (See Chapter 14, Disclosure of Military Information on restrictions 3) and 4).)

Appropriations Act Restrictions. This segment of DAR Section VI contains specific restrictions on the use of appropriated funds for the acquisition of certain supplies such as food, clothing, specialty metals, etc. Additionally, certain restrictions contained in various public laws and directed towards the acquisition of foreign buses, R&D contracting with foreign sources, and naval vessel construction in foreign shipyards are delineated.

Contracts obligate appropriated funds within the authorizations (in the form of the annual Authorizations Act) and limitations (as, for example, in public laws) imposed by Congress. It is not uncommon for Congress to attach "riders" to appropriations acts restricting the use of monies appropriated. In addition to establishing specific restraints on how appropriated money will be spent, the Congress establishes some of the policies on how Government contractors may receive financial assistance on contracts. The General Accounting Office (GAO), as an agency of Congress, watches over executive branch expenditures of the appropriations provided to insure compliance with the restrictions placed on the use of these funds.

In the program manager's domain, there is a clear division of responsibility between the budgeting, controlling, and accounting of monies

provided as contrasted with the contractual obligation thereof. The former is a function of the Comptroller while the latter is the responsibility of the Contracting Officer. The Contracting Officer is directly involved in the area of obligations and contract funding. Understanding the limitations on, as well as the impact of, obligations is a key to successful contract administration. This understanding is important to program control as well as knowledge of the fact that personal liability in the form of the Anti-Deficiency Act (31 U.S.C. 665a) accompanies budgetary and contractual authority.

The Act provides that no government officer or employee shall authorize or create any obligation, or make any expenditure, in excess of an apportionment (the Office of Management and Budget's distribution of amounts available in an appropriation fund account) or administrative subdivision of appropriated funds. Contracting officers face Anti-Deficiency Act penalties by establishing obligations (awarding contracts) without a commitment (a funded purchase request) or exceeding the monetary limits of their individual contracting officer warrants.

Another way in which the Anti-Deficiency Act may become operative involves cases where the foreign contract is priced and paid in the local currency. Exchange rate fluctuations in favor of the local currency, where the local currency appreciates in value in relation to the dollar, can result in violation of the Anti-Deficiency Act. The contracting officer must take special precautions to avoid this possibility. It must be made certain that adequate dollar funds are available to cover any purchases of foreign currency which may be needed from time to time for purposes of making payments under the contract, even though the value of the currency may have risen appreciably in relation to the dollar. More specific discussion of the financial management issues are discussed in Chapter 12 on Financial Management.

One other appropriations area should be mentioned. Congressional limitations on the use of appropriated funds are either time restrictions or subject-matter (use) restrictions. Time restrictions (annual, continuing, or multiple year appropriations) limit the time during which funds may be obligated, expended, or both. Subject-matter restrictions (R&D, individual programs) limit the use to which money may be spent for accomplishing specific purposes.

The program manager generally will have considerable flexibility in the management of the funds provided through the appropriations process. Those restrictions found in the DAR are targeted at specific markets. For example, notwithstanding the restrictions mentioned earlier, purchases of specialty metals or chemical warfare protective clothing are exempted from Appropriations Act restrictions when such acquisition is necessary to comply with foreign governments requiring the U.S. to purchase supplies from foreign sources for the purposes of offsetting sales made to the U.S. Government or domestic concerns under approved programs serving defense requirements. The exemption also applies where such acquisition is in furtherance of an agreement with a qualifying country. Other specific markets covered in the DAR include:

1. Acquisition of Foreign Buses. Public Law 90-400, Fiscal Year 1968. This law provides that appropriated funds will not be used for the purchase, lease, rental, or other acquisition of buses, other than

those manufactured in the United States, except as may be authorized by the Secretary of Defense.

2. R&D Contracting with Foreign Concerns. Public Law 92-570, Fiscal Year 1973. This law provides that no funds appropriated for the Department of Defense are available for entering into any contract or agreement with any foreign corporation, organization, person, or other entity for the performance of research and development in connection with any weapon system or other military equipment for the Department of Defense when there is a U.S. corporation, organization, person, or other entity equally competent to carry out such research and development and willing to do so at a lower cost.

3. Hull,Midbody, and Superstructure of Naval Vessels. Each year the Department of Defense Appropriations Authorization Act contains the Burns-Tollefson amendment which reads in part: "Provided, That none of the funds herein provided for the construction or conversion of any naval vessel to be constructed in shipyards in the United States shall be expended in foreign shipyards for the construction of major components of the hull or superstructure of such vessel: Provided further, That none of the funds herein provided shall be used for the construction of any naval vessel in foreign shipyards." This Amendment is located under Shipbuilding and Conversion, Navy.

DUTY AND CUSTOMS

It is DoD policy to obtain the issuance of duty-free entry certificates covering end items acquired through the foreign acquisition process. DAR 6-1302 requires that duty-free entry clauses as contained in DAR 7-104.31 be included in all negotiated contracts in excess of $100,000, and all contracts involving the furnishing of supplies except for small purchases, and contracts for supplies exclusively for use outside the U.S. This includes FMS contracts. When the clauses are included, both the clauses themselves and DAR 6-603.2(b) require that duty-free entry certificates be issued. Such certificates must be limited to carefully selected situations since they could result in unanticipated profits to contractors, especially under fixed-price-type contracts, and could involve administrative expenses far outweighing any possible savings to military appropriations. Thus, DoD policy encompasses the use of such duty-free entry certificates whenever there is reasonable assurance that advantages, such as cost savings, will outweigh the administrative and other costs of processing duty-free certificates and of maintaining controls to verify that the full benefit of the certificates passes to the Government. For example, a contractor awarded a fixed-price-type contract based on providing a domestic end product or component cannot subsequently furnish a foreign end product/component and receive a duty-free entry certificate without an appropriate reduction in price.

DoD policy is carried out by including in the contract one or more of the appropriate DAR clauses. When a prime contract involving foreign supplies contains the appropriate clause, the contractor must notify the Contract Administration Office (CAO), designated in the contract, of a purchase of foreign supplies under the contract. The CAO verifies that the prime contract includes the appropriate duty-free entry for imports -- possible duty-free entry clause; and in the latter case, the contracting officer has agreed to

furnish a duty-free entry certificate for the items identified in exchange for a reduction in contract price, in the amount of duty which would be payable, if duty-free entry certificates were not issued pursuant to the provisions of this clause. The CAO then forwards the notification to Commander, Defense Contract Administration Services Management Area, New York.

When the Government agrees to execute duty-free entry certificates for supplies, the contractor is notified that the foreign supplier is to include on the bill of lading (or other shipping document) the information required to be inserted on such documents as provided in the clause. Failure to include such information on the bill of lading (or other shipping document) will result in the shipment being treated as a shipment without benefit of free entry under Schedule 8, Part 3, Item No. 832.00, Tariff Schedules of the United States.

Upon receipt of a request for duty-free entry, the designated Government representative prepares the required Customs Forms and executes the duty-free entry certificate and forwards two copies of Customs Form 7501A to the District Director of Customs submitting the request.

Immediate release permits, executed on Customs Form 3461 (Application for Special Permit for Delivery of Perishable and Other Articles, Immediate Delivery of Which is Necessary), entitles all shipments qualifying as "emergency purchases" of war material abroad to be released immediately by the District Directors of Customs at the various ports of entry, prior to and pending the filing of Customs Form 7501 and 7501A and a duty-free entry certificate. The existence of an immediate release permit on file at a port of entry does not dispense with the necessity of filing Customs Form 7501 and 7501A and appropriate duty-free entry certificates.

Duty and Customs should not be confused with exemptions available regarding foreign taxes. Tax agreements have been executed on a government-to-government basis with a number of nations. Under these agreements, U.S. defense expenditures are exempted from certain specified taxes of the countries in which the expenditures occur. Nevertheless, countries which have not executed a tax agreement with the United States may grant relief from internal taxes in order to promote or subsidize exports. Again, the contracting officer must be aware of or explore those situations to avoid windfall profit situations and other disadvantageous conditions. Whatever the situation,, appropriate tax clauses should be included in all contracts to be performed in foreign countries so that national interests are protected.

It should be pointed out, however, that contracting officers may not demand relief from taxes concerning which the United States is not exempted specifically by applicable agreements. In this regard, the terms and provisions of the various bilateral tax agreements to which the United States is a party in the North Atlantic-Mediterranean area are included in the USEUCOM Supplement to the DAR.

APPLICATION OF COST ACCOUNTING STANDARDS (CAS)

The cost accounting practices of foreign business firms vary substantially from country to country and from contractor to contractor. A review by the Cost Accounting Standards Board disclosed that as a result of these wide

variations the application of certain accounting standards and rules could cause significant administrative problems. Thus, on 14 November 1978, the Board exempted foreign firms from each cost accounting standard other than Standards 401, "Consistency in Estimating, Accumulating and Reporting Costs," and 402, "Consistency in Allocating Costs Incurred for the Same Purpose." Foreign concerns are still required to file Disclosure Statements. Contracts and subcontracts awarded to foreign governments and their agencies are exempt from all standards and rules of the Board.

By law, the U.S. Congress requires use of Cost Accounting Standards and disclosure of cost accounting practices in connection with negotiated national defense contracts. Non-compliance with the provisions of the standards or a contractor's disclosed cost accounting practices may result in a contract price adjustment determination by the contracting officer. Additionally, CAS places certain restrictions on the application of costs to contracts from an accounting standpoint.

DISPUTES

Though contractual disputes are seldom resolved easily, the procedures for effecting resolution are, in the case of domestic contracts, delineated clearly and made binding on the parties. This is not necessarily true of foreign acquisitions. In fact, under government-to-government type contracts, the only practical remedy may lie in diplomatic negotiations between the governments concerned. A different situation, but still a difficult legal hurdle, exists where the foreign host nation effects a contract with a foreign supplier on behalf of the United States. In the event of a suit under the contract between the host nation and the supplier, settlement is generally made in the courts of the host country.

Where a contract is awarded by a DoD buying agency under foreign acquisition procedures, a foreign contractor is entitled to the same administrative remedies available to U.S. contractors. Such remedies are contained in the Contract Disputes Act of 1978 (PL 95-563) which provides a comprehensive procedure for resolving disputed contractor claims arising under the contract. This procedure permits contractors to appeal matters which cannot be agreed upon to the Armed Services Board of Contract Appeals (ASBCA) or the U.S. Court of Claims. It should be noted that a Secretary of Defense Determination on 26 December 1979 exempted contracts with NATO governments from the provisions of said Act.

INTERNATIONAL AGREEMENTS

Various treaties and international agreements in effect between the United States and foreign governments, especially those with governments receiving military and economic aid under the Foreign Assistance Act of 1961, affect acquisition in foreign countries. Particular attention should be given to the provisions in these agreements which pertain to purchase procedures, contract forms and clauses, taxes, patents, technical information, facilities, and other matters relating to acquisition.

Copies of existing international agreements with the United Kingdom of Great Britain and Northern Ireland, Western European countries, North Africa, and in the Middle East are filed with the United States European Command

(APO 09128, New York). Agreements with countries in the Pacific and Far East are filed with the United States Pacific Command (CINCPAC). Many of the agreements are compiled in the "United States Treaties and Other International Agreements" series (TIAS), which is published by the Department of State. Copies of this publication are normally available in overseas legal offices and U.S. diplomatic missions. In addition, Military Assistance Advisory Groups, Naval Missions, and Joint United States Military Air Groups normally have copies of the agreements applicable to the countries concerned.

In placing contracts with contractors outside the United States for performance outside the United States, contracting officers, including those in the United States, should ascertain the existence and applicability of any international agreements and comply with such agreements.

When it has been determined that an acquisition will be made from a foreign contractor, overseas contracting offices may be utilized. Contracting offices, not within the command jurisdiction of a unified or specified command and anticipating placement of contracts with foreign contractors, should maintain liaison with the appropriate component commander during preaward negotiations and postaward administration. Where an acquisition may result in a requirement or logistical support of contractor employees or additional Government employees in an overseas location, the contracting officer should insure that the contract file includes documentation reflecting specific advance approval for such commitment from the appropriate component commander.

EXAMINATION OF RECORDS

In accordance with 10 U.S.C. 2313(c), the Examination of Records by Comptroller General clause may be excluded from negotiated contracts and subcontracts with foreign contractors and foreign subcontractors where:

1. the Secretary of Defense or his designee determines, with the concurrence of the Comptroller General or his designee, that inclusion of the clause would not be in the public interest; or

2. when

   (A) the contractor or subcontractor is a foreign government or agency thereof or is precluded by the laws of the country involved from making its books, documents, papers, or records available for examination, and

   (B) the Secretary determines, after taking into account the price and availability of the property or services from U.S. sources, that the public interest would be best served by exclusion of the clause.

A determination of the Secretary of Defense under 2. above does not require the concurrence of the Comptroller General. However, where a determination of the Secretary under 2(B) is the basis for exclusion of the Examination of Records by Comptroller General clause, the statute requires that a written report be furnished to the Congress. This report, which explains the reasons for the determination, is submitted in triplicate by the Department concerned, to the Office of the Assistant Secretary of Defense (Comptroller).

The Examination of Records by Comptroller General clause is included in contracts wherever possible. Exclusion of the clause is allowed only after the contracting officer has made all reasonable efforts to include the clause and has considered such factors as alternate sources of supply, additional cost, and time of delivery. "Foreign contractor" for Examination of Records purposes is defined as "one that is organized or existing under the laws of a country other than the United States, its territories or possessions."

BALANCE OF PAYMENTS PROGRAM

The Department of Defense Balance of Payments Program was established to reduce unfavorable trade balances between the United States and various countries that contain sizable American installations and personnel. Except for petroleum and Military Assistance Programs, the Balance of Payments Program is applicable to all contracts for supplies and services required for use outside the United States, as well as to the acquisition of scientific and technical knowledge resulting in dollar expenditures outside the United States and Canada.

In accordance with the program, contracts for supplies, services, or research and development efforts of nondomestic origin may not ordinarily be made. Certain exceptions are authorized, including contracts that must be made from a foreign source pursuant to a treaty or executive agreement between governments, acquisitions made with excess and near-excess foreign currencies, small purchases (under $10,000), and contracts not to exceed $2 million (except for those requiring reviewing authority approval at levels above the contracting officer). Additionally, approval by the Secretary of the Department concerned or the Under Secretary of Defense for Research and Engineering is required for contracts exceeding $2 million.

Other exceptions are permitted under the Balance of Payments Program when it is determined that there is unreasonable cost for a domestic product or that the acquisition of a domestic end-product is inconsistent with the national interest. An evaluation factor of 50% is presently being used in favor of domestic offers; that is, the bid of the non-domestic offer is increased by 50% before being compared with the bid of a domestic offer.

CANADIAN PURCHASES

The governments of the United States and Canada have a long history of mutual cooperation aimed at the coordination of economic efforts to achieve integration of military production, standardization of military equipment, dispersal of production facilities, establishment of supplemental sources of supply, and greater flow of defense supplies/equipment between the two countries. In fact, Canadian-U.S. agreements have served as the forerunners of the current DoD qualifying country agreements. As part of the DoD policy to insure the best possible coordination of the above efforts, purchases from Canadian sources are exempt from both the Buy American Act and the Balance of Payments Program. Such purchases are accomplished through the Canadian Commercial Corporation (CCC), an agency of the Government of Canada.

Centralization of contractual activity through the CCC represents a unique arrangement between the U.S and Canada and is described as follows. Contracts with Canadian firms are normally made with and through the CCC. The

CCC coordinates the placing of Canadian firms on individual contracting office, bidders' mailing and comparable source lists. Such bidders' list applications are forwarded by the CCC to the U.S. activity having acquisition responsibility for the supplies and services involved. Solicitations are then forwarded directly by the contracting activity to Canadian firms with a copy to the CCC.

Canadian firms prepare offers which are then submitted to the CCC. This is significant in that the ultimate contract if awarded to a Canadian source, is between the contracting activity representing the U.S. Government and the CCC. On receipt of the Canadian firm's response, the CCC prepares a letter to the U.S. contracting activity. This letter supports the Canadian firm's offer, confirms and endorses the offer in the name of the CCC, and states that the CCC will subcontract 100 percent with the offeror. This procedure is similar to that used in domestic contracts under the Section 8(a), Small Disadvantaged Business Concerns program wherein contracting activities award contracts directly to the Small Business Administration (SBA) which in turn subcontracts with 8(a) firms.

A number of other features of the U.S.-Canada arrangement are both worth mentioning and interesting. The Department of Supply and Services (Canada) under the Canadian Department of Industry, Trade and Commerce, provides, without charge, contract administration services for all contracts placed with the Canadian Commercial Corporation. These services include cost and price analysis, industrial security, accountability and disposal of U.S. Government property, production expediting, insuring compliance with Canadian labor laws, processing of termination claims and disposal of termination inventory, customs documentation, processing of disputes and appeals, and such other related contract administration functions as may be required with respect to the CCC contract with the Canadian supplier. Further, the Canadian Government guarantees to the U.S. Government all commitments, obligations, and covenants of the Canadian Commercial Corporation in connection with any contract or order issued to the CCC by any contracting activity of the U.S. Government.

EFFECTS OF THE GENERAL AGREEMENT ON TARIFFS AND TRADE (GATT)

Background

The GATT provides a framework for reducing tariffs and other trade barriers through a series of multinational negotiations that have been ongoing for over fifteen years. Fourteen specific agreements and codes have resulted from the Kennedy and Tokyo rounds of these multinational trade negotiations. Some examples are:

- Countervailing Measures and Antidumping Codes
- Agreement on Implementation of Art VII (Customs Valuation)
- Agreement on Government Procurement
- Agreement on Trade in Civil Aircraft
- Agreement on Import Licensing Procedures

- International Dairy Agreement

The GATT was implemented in the U.S. by Public Law 9o-39, "Trade Agreement Act of 1979," which became effective on 1 January 1981. Of specific interest to the DoD is the Agreement on Government Procurement. Nineteen (19) countries are covered as of 1 January 1981 with 26 lesser developed countries also eligible under the Agreement. Figure 7-4 lists 44 of these designated countries (aside from the U.S.).

FIGURE 7.4. LIST OF DESIGNATED COUNTRIES

Austria	France	Niger
Bangladesh	Gambia	Norway
Belgium	Guinea	Rwanda
Benin	Haiti	Singapore
Bhutan	Hong Kong	Somalia
Botswana	Ireland	Sweden
Burundi	Italy	Switzerland
Canada	Japan	Western Samoa
Cape Verde	Lesotho	Sudan
Central African Republic	Luxembourg	Tanzania U.R.
Chad	Malawi	Uganda
Comoros	Maldives	United Kingdom
Denmark	Mali	Upper Volta
Federal Republic of Germany	Nepal	Yemen AR
Finland	Netherlands	

The significant features of the Agreement are:

- Article I--applies to government procurement of supplies and their incidental services on any contract of SDR 150,000 (approximately $200,000) or more.

- Article II--waives discrimination barriers.

- Article III--specifies special treatment of developing countries.

- Article IV--requires preparation of technical specs in a way which is not an obstacle to internal trade.

- Article V--defines tendering procedures--general rule is open tendering but exceptions for selective tendering.

- Article VI--requires use of procurement regulations publically available.

- Article VII--provides for enforcement of obligations.

- Article VIII--Specifies exceptions to agreement--

  Does not preclude actions..."Necessary for the protection of its essential security interests relating to the procurement of arms, ammunition or war materials, or to procurement indispensable for national security or for national defense purposes."

- Article IX--contains final provisions--acceptance; amendments; withdrawal, etc.

Elements of DAR 6-1600

Implementing the law, a new part 1600 has been developed for DAR Section VI on Foreign Acquisitions, effective 1 January 1981 for DoD use. The significant points of DAR 6-1600 are the waiver of the "Buy American" Act and the International Balance of Payments (IBOP) requirements for acquisitions of SDR 150,000 (about $200,000) or more for the list of 44 countries. DAR 6-1600 is not applicable to small business set-asides and Berry amendment (specialty metals, bearings, etc.) items. Labor surplus set-asides are not, however, excluded.

Proposals received as the result of requests for proposals (RFPs) covered by DAR 6-1600 must be opened in the presence of an impartial witness. In addition, a firm will have the right to be told why its bid lost and why the winner was selected. If the firm is not satisfied with the explanation, it must be able to make an appeal. A new clause within applicable contracts and a new certificate within each RFP are required, as covered in DAR 7-104.3(b), "Buy American Act, Trade Agreements Act, and the Balance of Payments Program (January 1981)," and DAR 7-2003.47(b) "Buy American-Trade Agreements-Balance of Payments Program Certificate (January 1981)," respectively.

DAR 6-1600 covers only the following Federal Supply Class (FSC) Categories:

22 Railway equipment

23 Motor vehicles, trailers, and cycles (except 2310 and 2350)

24 Tractors

25 Vehicular equipment components

26 Tires and tubes

29 Engine accessories

30 Mechanical power transmission equipment

32 Woodworking machinery and equipment

34 Metalworking machinery (except 3408, 3410-3419, 3426, 3433, 3441-3443, 3446, 3448, 3449

35 Service and trade equipment

36 Special industry machinery (except 3690)

37 Agricultural machinery and equipment

38 Construction, mining, excavating, and highway maintenance equipment

39 Materials handling equipment

40 Rope, cable, chain and fittings

41 Refrigeration and air conditioning equipment

42 Fire fighting, rescue and safety equipment

43 Pumps and compressors

44 Furnace, steam plant and drying equipment (except 4470)

45 Plumbing, heating and sanitation equipment

46 Water purification and sewage treatment equipment

47 Pipe, tubing, hose and fittings

48 Valves

49 Maintenance and repair ship equipment (except 4920-4927, 4931-4935, 4960)

52 Measuring tools

53 Hardware and abrasives

54 Prefabricated structures and scaffolding

55 Lumber, millwork, plywood and veneer

56 Construction and building materials

61 Electric wire, and power and distribution equipment

62 Lighting fixtures and lamps

63 Alarm and signal systems

65 Medical, dental, and veterinary equipment and supplies

66 Instruments and laboratory equipment (except 6645)

67 Photographic equipment

68 Chemicals and chemical products

69 Training aids and devices

70 General purpose automatic data processing equipment (ADPE), software, supplies and support equipment

71 Furniture

72 Household and commercial furnishings and appliances

73 Food preparation and serving equipment

74 Office machines, visible record equipment and ADP equipment

75 Office supplies and devices

76 Books, maps and other publications

77 Musical instruments, phonographs, and home type radios

78 Recreational and athletic equipment

79 Cleaning Equipment and supplies

80 Brushes, paints, sealers and adhesives

81 Containers, packaging and packing supplies (except 8140)

8460 Luggage

85 Toiletries

87 Agricultural supplies

88 Live animals

91 Fuels, lubricants, oils and waxes

93 Non-metalic fabricated materials

94 Non-metalic crude materials

96 Ores, minerals and their primary products

99 Miscellaneous

GATT Procurement Significance

The effect of the GATT is to open up an estimated annual $75 billion (based on 1979) market among designated countries to international competition. In the U.S., it is expected that the Agreement on Government Procurement will open up to foreign bidders about $18 billion of DoD purchases, which is about two-thirds of the estimated U.S.G. market of $27 billion/year (based on 1979). The DAR 6-1600 defines a designated country end product as that wholly produced, manufactured, or substantially transformed in the designated country.

NATO STANDARDIZATION EFFORTS

NATO Working Group AC/94 has been charged with studying ways to eliminate obstacles to licensing and coproduction, key elements of long-term standardization programs. This working group established a set of Intellectual Property Principles and Guidelines, which was approved by the CNAD in 1979 and distributed to all DoD acquisition activities for their use in structuring future collaborative coproduction and licensing projects with our NATO allies. Reference to this report is contained in chapter 13 on Intellectual Property.

In 1980, the terms of reference for working group AC/94 were expanded and the name changed to permit it to address a broader range of problems. The new NATO Group on Intellectual Property and International Cooperative Arrangements is now turning to a number of other contracting and acquisition subjects which must be addressed time and time again on on multinational projects, and which may lend themselves to some type of common agreement and solution. For example, currency exchange procedures, patent indemnity, insurance practices, non-recurring cost charges, customs, taxes and duties, among others, have been identified by AC/94 as good candidates for future study within a NATO forum.

8. INTELLECTUAL PROPERTY

GENERAL POLICY

This chapter explores the subject of intellectual property (IP) transfer, including the roles of the industrial and DoD project managers, legal and economic environment constraining transfer, and possible techniques for such transfer. Intellectual property covers a broad range of managerial and technical knowledge and expertise. The NATO Intellectual Property Group, AC/94, has stated that "Intellectual Property" (IP), whether background or foreground, includes inventions, patented or not, trademarks, industrial designs, copyrights and technical information including software, data, designs, technical know-how, manufacturing information and know-how, techniques, technical data packages, manufacturing data packages and trade secrets. They defined Intellectual Property Rights (IPR) as "The rights to use or have used IP, ... and include rights derived from patents, trademarks, copyrights, industrial designs, contract clauses, disclosure in confidence techniques, or other means of control of IP."

It is important to state at the beginning of this chapter that the laws of our European allies in NATO covering rights in inventions, data, and software are substantially different from those of the United States. The European inventor maintains ownership of inventions with rights to use the invention. IP/IPR is usually owned by industry and the individual. However, provisions committing a contractor to enter license agreements are part of the Federal Republic of Germany's (FRG) development contract regulations and the United Kingdom's regulations in the "International Collaboration Clause." The reasonableness of the licensing fee is addressed in the FRG regulations.

IPR must be considered very early in either a collaborative program or a program that has collaborative potential. Thus, the potential for such rights should be considered in national R&D programs, and provision for their possible transfer in later production arrangements should be included in the operative contracts. The Project Manager should be involved and consulted at all stages of a program to ensure that IPR issues are resolved. Normally, there are three types of documents that have an impact on IPR: Memoranda of Understanding (MOUs), contracts between a government and a private contractor and licensing agreements between private firms. Each of these agreements sets the parameters for and governs the agreements to follow. The progression from MOU to contracts to license agreements is a flow from general to specific.

The place to begin to lay the correct groundwork is in the MOU. Whether a program is collaborative from the beginning or becomes so at a later date, the international document formalizing the agreement is usually an MOU. The IP section in an MOU typically is one of the most detailed, precisely because of the importance of the matter being treated. Basically, it provides an intergovernmental understanding on the transfer and use of national technologies in both their applied and unapplied states. As such, it defines the parameters of specific agreements subsequent to, and arising from the MOU, on the exchange of specific information. It is necessary that this section provide clear definition insofar as possible of the rights and responsibilities of

parties to the arrangement and provide a mechanism to oversee the appropriate implementation of the intent of this section.

NATO in recent years has shown increasing interest in this area and has published some guidance, among which are: Intellectual Principles and Guidelines in the Field of Licensing and Co-production for the Purpose of Armaments Standardization or Interoperability, AC/94-D/283 (final) 21 September 1979; Pamphlet on NATO Agreement on the Communication of Technical Information for Defense Purposes, April 1971; Military Equipment and Industrial Property Legislation, Vol 1. November 1976.

Definition of Terms

Clear, intelligible, and mutually understood definition of terms used in the text of the IP clause will minimize potential misunderstandings between parties. Whenever possible, standardized terms and their definitions (preferably previously agreed upon NATO examples) should be used to provide a continuity between agreements. However, it should be noted that the constantly evolving nature of the IP field renders static definitions unworkable and undesirable. The following definitions for the most part are used commonly in MOUs or have been defined by NATO.

- Technical information means recorded information, regardless of form or characteristic, of a scientific nature and may be, for example, experimental and test data, specifications, designs, processes, techniques, inventions whether patentable or not, technical writings, sound recordings, pictorial reproductions, drawings and other graphic representations, magnetic tape, computer memory printouts, or data retained in computer memory, and any other relevant technical data, in whatever form presented and whether or not copyrighted.

- Defense Purposes refers to manufacture and use in any part of the world by or for the Armed Forces of a Participating Government and includes the furnishing of assistance by a Participating Government on a grant basis to non-Participating Governments and international organizations for their mutual defense.

- Defense Sales refers to sales by a Participating Government or its contractors to a non-Participating Government for their mutual defense purposes.

- Foreground Information is information generated in the course of or under the cooperative project.

- Background information is information not generated in the course of or under the cooperative project which is necessary to or useful in the project. It may be proprietary to contractors or other third parties.

Major Considerations

The major substantive issues treated in the IP Section of the MOU will be considered under five headings: Disclosure of IP, Authorized and

Unauthorized Use of IP, Protection of IP, Availability of Rights in IP, and Disputes Involving IP and Accountability of Parties. Despite variations between types of MOUs, each IP section should address these major issues.

The disclosure provisions define the types of information to be exchanged and provide the guidelines that will govern the exchange of IP generated both within and without the program. These provisions identify the types of IP affected, and establish the channels and means of transfer or communication of IP to Parties. Authorized and unauthorized uses of IP provisions specify how the various types of IP received under the project may be used. Drafters should distinguish between project-generated, government/contractor-owned, and 3rd party, IP. Types of use designations are essential if parties desire to constrain the overflow of technology beyond the particular project or beyond each government's defense industry.

The Availability of Rights provisions ensure that parties to the agreement will make available any government-owned rights in IP to other parties as called for in the agreement. These provisions further establish the policy whereby parties will ensure, through individual efforts, the availability of rights in IP now owned by the government. This section is critical to the successful functioning of the entire clause because: (1) normally IP cannot be used legally without express legal rights, and (2) 3rd party IP may be essential to the project and parties must agree to use their best offices to secure the rights to such IP.

Provisions for the protection of owner's rights in IP are necessary to facilitate willingness to exchange IP. Such provisions should restrict further disclosure of IP beyond the parties authorized in the text and their authorized subcontractors. In addition, that IP subject to limited or restricted rights use or proprietary IP must be clearly marked as such by the originating party. Without proper marking, recipients are under no special restrictions on the use of the IP, and incur no liability for misuse. Accountability of Parties for misuse provisions and disputes resolution provisions establish the policy which will govern determination of liability in the event of misuse of IP under the arrangement.

Disclosure of IP

The disclosure provisions in this section identify the types of IP subject to exchange and provide the guidance and mechanism which govern the actual disclosure among the parties. Normally, these provisions distinguish between foreground and background IP.

- Specify the type of information to be disclosed:
  - -- Non-IP information.
  - -- All IP or specified type of IP.
  - -- Background IP.
  - -- Foreground IP.
- Establish requirement for disclosure.

- Establish procedure for disclosure.

  -- Determine report requirements:

    --- Designate appropriate points of contact for IP exchange.

    --- Specify frequency of reports:

      ---- periodic.

      ---- as developed.

Authorized and Unauthorized Use of IP

These provisions specify the precise guidelines which will govern the use of any IP exchanged or produced under the MOU. It is essential that parties fully understand the limitations which may accompany the use of IP under differing projects. Those purposes not expressly stated in the text should be considered to be beyond the authorization of the text and therefore are to be prohibited.

Establish Guidelines for Authorized Use of IP

- Defense purposes:

  -- Information only.

  -- Evaluation and testing.

  -- Manufacturing.

  -- Project only.

- Government purposes.

- No limitations.

Protecting Owner Rights in IP Under the Arrangement. The success of the IP disclosure and sharing provisions will depend upon corollary provisions that provide safeguards for owners rights and establish carefully circumscribed guidelines and procedure for further disclosure. The control of IP disclosure should provide for the following:

- Prohibit further disclosure to non-participants without express authorization:

  -- Provide for exemption of national contractors and subcontractors in specific cases.

- Set forth consent requirements for disclosure to non-participants:

  -- Unanimous consent.

-- Consent of original providing party.

-- Consent by owner.

- Provide rules for the force and effect of restrictive legends on the use of proprietary or security information:

  -- It is the responsibility of providing party to mark the material at time of initial disclosure:

     --- Failure to mark properly relieves recipient of any liability for misuse.

  -- The first recipient is liable in the event of further disclosure.

- Provide for obtaining patents covering foreground inventions:

  -- Reference the Patent Cooperation Treaty, International Convention for the Protection of Industrial Property.

  -- Designate who files for patents.

  -- Define the rights of non-filing Parties.

- Insert a "reach back" clause to reaffirm or validate any pre-MOU project IP exchanges or understandings.

- Insert "reach forward" provisions to provide guidelines for use of IP in subsequent activity related to the joint program.

Availability of Rights in IP

Implicit in ownership of IP is the possession of certain exclusionary rights which prevent or prohibit the unauthorized use of the IP. Thus, before an individual other than the owner may use the IP, he must secure the express consent of the owner or incur a liability for unauthorized use. Normally, rights to use IP are transferred by a licensing agreement. Parties to a license may be private individuals or governments. The license defines the IP in question, the limits of its use, and confers the rights necessary for the licensee to use the IP without incurring a liability.

Often, licenses for background IP owned by the Parties or their contractors are necessary for the furtherance of the co-operative project, the utilization of the results of the project, or for standardization/ interoperability purposes. Accordingly, the arrangement should provide for securing the availability of such licenses on fair and reasonable terms to be subsequently negotiated with the IP owner. Governments should stipulate in their contracting to implement the MOU that contractors will make available on reasonable terms any IP generated or required in a specific project to other designated parties for the purpose of furthering NATO standardization. A

mandatory licensing provision in the defense contract provides a good tool for this purpose.

- Stipulate the range of rights accruing to the recipient of government-owned IP, both foreground and background:

  -- Defense purposes.

  -- Non-defense purposes.

  -- Manufacturing or other use.

  -- Information only.

- Stipulate those restrictions on use of 3rd party/proprietary IP:

  -- Defense purposes.

  -- Project use only.

  -- Information only.

- Stipulate financial terms of IPR transfer.

  -- Proprietary IP should be LICENSED on fair and reasonable terms. Home government of owner of proprietary IP should take necessary steps to ensure that required proprietary IP and its rights will be made available and negotiated on fair and reasonable terms.

- Governments must be able to obtain for itself, its contractors, other parties, and their contractors, rights to use background IP on fair and reasonable terms negotiated with the IP owner.

- Specify appropriate reporting requirements for foreground and background IP known to the Parties or their contractors.

Disputes Involving IP and Accountability of Parties

- Policy and procedure should be established to govern the settlements of disputes involving IP for:

  -- Disputes between parties.

  -- Claims against parties by 3rd party owners of IP or IP rights.

- Accountability of Parties:

  -- Establish policy that will govern determination of accountability and liability in disputes arising over IP misuse:

     --- By governments.

--- By designated contractors.

---- Governments can be held responsible for actions of their contractors as they affect IP.

- Define the contractor's scope of action:

  -- Designated national contractors are normally constrained by the same terms as their respective governments.

- Third party misuse of IP:

  -- Establish procedures for resolution:

     --- Determine which party will pursue case, where case will be resolved, who will pay administrative and legal costs.

- Compensation:

  -- Establish claims policy and procedure for compensating damaged parties in the event of IP misuse.

CONTRACTING

It is essential to realize that without the cooperation of the holder of the intellectual property rights, intellectual property transfer cannot take place. Firm-to-firm exchanges without interference of third parties are essential to a successful IP transfer, particularly in the key role of know-how and technical assistance. The same problem exists in the transfer of manufacturing drawings in competitive procurements, because the firms that actually expect to follow the drawings, rather than convert the drawings to suit their own shop processes and practices, rarely possess the technology capabilities and the processing know-how.

At the earliest state of a program and at each subsequent stage, steps should be taken to ensure, through appropriate contractual arrangements or options, that NATO nations will be permitted to participate in research, development, or production. This applies whether the program is carried out on a national or collaborative basis. If the program is collaborative from the outset, an MOU will normally be in effect. As mentioned previously, it will address IPR, and the contract must be constructed so as to conform to the terms of the MOU. If the program is a national program and not the subject of an MOU, a different problem exists. Care must be taken so that if the program becomes collaborative at a later date, the IPR will be available to our future partners. As a minimum, all contracts should include a provision committing the contractors to transfer, as necessary for the success of the cooperative program, portions of the intellectual property developed for, or used in, performance of the contract, under license at a fair and reasonable price.

This procedure is the cornerstone of the implementation of the NATO AC/94 Guidelines. When a provision committing a contractor to enter a license is included in a U.S. Government contract, the Government can assure the availability of the IP for NATO cooperative programs. This practice has already been tried in the United States, but well before a cooperative program has

been well-defined. It is also a requirement in the Federal Republic of Germany's development contract regulations (ABEI) and has been successful according to German Ministry of Defense personnel. A similar contract commitment is in use in the United Kingdom, under the "International Collaboration Clause." In each of these instances, the government selects the licensee. In Germany, the contractor is normally consulted and he can, but allegedly rarely does, veto the first choice if it is a severe threat to his competitive position. There are also criteria for establishing the reasonableness of the license fee in the German regulations.

Under the Federal Republic of Germany's policy, the contractor retains all IPR, but commits to license all necessary IP to a second source at a fair and reasonable price, as specified by the German Government. In practice, the Government's choice of a second source has been subject to a de facto veto of the primary source contractor. This veto has typically been exercised when the primary contractor regarded the second source as a head-to-head competitor. The license fee is effectively paid by the Government and typically includes some (relatively small) payment for foreground information. Typical license fees under such an arrangement are 3-5 percent plus some front-end money when warranted.

Implementation takes the form of a contract option which can be exercised by government. When the option is exercised, the contractor enters into negotiation for a license with a licensee for all or part of a system or item. Normally, a licensee requires enough IP transfer so that he can produce as does his licensor; needed patents, data, know-how and technical assistance as required are provided in exchange for money. While the licensee usually pays, payment by a licensee government is a possible alternative.

Provisions for multiple licensees may be considered. Limitations on the time of exercise of the option and on the scope of the subject to be transferred must be defined. Protection of the transferred IP, may be guaranteed by licensor and licensee governments. The issue of ongoing use of the IP; i.e., if it is permitted or not, must be addressed. Retransfer to a second tier must be agreed to or prohibited. A mechanism to resolve disputes must be included. The mechanism of configuration control and capacity to accommodate a technical change, or a prohibition of technical change, need to be addressed. The "level" of IP as to piece parts and vendor-supplied material, its specification, and the like cannot be omitted. The clause committing the contractor to license should probably contain an outline of, or suggest a minimum set of clauses for, the resultant license.

Contractor transfer of IPR simplifies Government IP management. It reduces the magnitude of the problem of leaking of Government-owned unlimited rights data under the Freedom of Information Act, but clearly only for data falling under NATO-related acquisitions. This problem will remain unresolved for DoD unlimited rights data at large, at least until its designation as "agency records" versus "valuable property" is legally resolved.

LICENSING AGREEMENTS

Traditionally, the subject matter of licensing agreements in R&D has included three distinct categories of rights in IP: patents, trademarks, and know-how. Only patents and know-how are discussed here, because trademarks have little significance in military procurement.

Patents

A patent is a grant of certain monopoly rights conferred by a government on an inventor by virtue of his invention and enforceable for a certain period of time, and only within the territorial limits of the country in which it was granted. The monopoly granted to the patentee excludes others from making or using the invention by enabling the patentee to bring suit for infringement. In this sense, a patent cannot prevent infringement, but it does provide for redress.

Know-How

The other major right usually granted in a license is know-how. Know-how is a peculiarly American term, which is receiving growing acceptance in international contracts. It is a generic term, embracing everything necessary to implement the licensing objective exclusive of patents and trademarks. Included may be trade secrets, manufacturing processes and techniques, specifications, charts, formulae, drawings and blueprints, marketing techniques, and professional advice. The list is nonexhaustive. Essential to the value of know-how is that it not be readily known or available to the public.

Know-how is a critical component in most licensing agreements, because it is generally necessary to utilize the patents licensed in the agreement. In fact, it has become increasingly common for licensing agreements to contain only know-how without patents.

The Restatement of Torts defines know-how as "any formula, device or compilation of information which is used in one's business and which gives an opportunity to gain an advantage over competitors who do not know or use it." Thus, know-how is exclusionary like a patent, granting a type of monopoly in that those who do not possess its knowledge cannot use it. However, know-how differs from patents in three significant aspects:

- The monopoly is de facto, as opposed to de jure.
- The monopoly is maintained indefinitely, as long as the know-how remains generally unknown.
- Some degree of secrecy is essential to the value of know-how; once commonly known, its value is destroyed.

The importance of know-how in licensing cannot be overstated. It is often essential to permit use of any patents licensed under an agreement. Moreover, with companies turning away from the patent system and relying increasingly upon know-how rights to protect their unpatented items and processes, know-how licensing can be the only means of transferring certain technologies.

Know-How and DoD Policies

Technical data and assistance, including drawings, specifications, and personnel training, are normally classified generically as know-how under foreign licensing agreements. However, the DoD defines know-how more narrowly and distinguishes it generally from technical data and assistance.

Know-how for the DoD is generally restricted to knowledge of an intangible nature; e.g., managerial competence, engineering expertise, or company experience. The DoD usually does not, and in most cases is constrained from, acquiring know-how that exceeds contract data requirements. This is primarily a factor of the intangible nature of certain know-how.

Though DAR 9-201 defines data broadly as "recorded information, regardless of form or characteristic," the definition acts to constrict DoD's know-how acquisition to recorded information. Unrecorded know-how is generally beyond DoD's reach, because, in most cases, it does not possess an industrial or manufacturing infrastructure capable of absorbing and retaining the information. Such a capability is usually not a part of the Department's mission. In addition, the very intangibility of the know-how often precludes specific identification of needed know-how.

THE LICENSE

The legal vehicle of the licensing agreement is the license itself. An IP license is a contract whereby the owner of IP--the licensor--agrees to make available his IP, along with the specific rights required for its use, to another entity--the licensee--for the specified purposes set out in the license, subject to any restrictions, and for a consideration. Foreign licenses invariably are written documents, due to the complexity of the issues and relationships involved, language barriers, and statutory mandates in certain jurisdictions.

Though there is no formal, required list of clauses necessary to a license, the following clauses are typical of U.S.-EEC license agreements.

- identity and legal address of parties
- "whereas" clause identifying licensor as owner of IP
- definitions of key words
- grant clauses
  - -- Scope
  - -- definition of IP involved
  - -- sub-license rights, if any
  - -- exclusivity, degree of
  - -- territorial limitations, if any
- technical assistance
- consideration
  - -- down payment, front end payment
  - -- royalties; base, computation, and duration
- exchange of related IP developed during license period by either party

- patent infringement

  -- third party infringement - action to be taken by which party to the license
  -- licensor/licensee as defendents - liability of parties
  -- initial fee
  -- royalties, base and computation

- confidential information, terms of protection

- term of patent protection

- term of license

- termination provisions

- audit rights of licensor

- warranty of utility of IP

- reporting requirements

- arbitration

- governing law and language

- force majeure, protecting both parties from liability for breach when an independent force prevents fulfillment of license terms; e.g., labor strike, expropriation

- commitment of licensee to exploit license

- other clauses which may address unique aspects of the relationship or serve to define further the understanding; e.g., separability waiver

- name and address for official notices.

Whenever the U.S. Government holds a royalty-free license, unlimited data rights, and pays for technical assistance to be provided to a second source, the primary source and his subcontractors are barred from charging the second source. In this case the price paid by the Government is limited to the actual cost of providing data, personnel, manufacturing aids, samples, spare parts, and the like; royalties are not an allowed cost.

Foreign license and technical assistance between U.S. and foreign contractors (including foreign governments) must meet the requirements of Section 124.04 of the International Traffic in Arms Regulation.

TECHNIQUES OF IPR TRANSFER

The main obstacle to the effective transfer of IPR is that the United States does not normally "own" enough rights to enable a second source to be able to produce the product. The U.S. will usually own a royalty-free license

for any patent that results from work that it funds, but this in and of itself is rarely sufficient to enable second source production.

Foreground information, foreground patents, and know-how are all necessary elements to the successful transfer of IP. Because the United States does not acquire these rights by law, they must be expressly addressed in the various documents mentioned previously. In essence, there are two generic ways to ensure that adequate IPR can be transferred to another firm. The government can either acquire all necessary IPR or it can be in a position to enforce a transfer of all necessary IPR to an entity of its choice (e.g., another firm or a government).

For the first method, the U.S. acquires a stand alone technical data package (Reprocurement Data Package) from the designer/developer. The criteria for selection of data rights clauses are set forth in DAR Section IX, Parts 2 and 3. The data package is intended for use in solicitation of other qualified manufacturers. It is very difficult to transfer technology from the developer to another source simply by providing a technical data package. Consequently, this technique may not be appropriate for use with highly complex systems or items experiencing substantial technological uncertainty. Also, the reprocurement data package technique shall only be used when the conditions in DAR Section IX are met and the following actions are completed:

(1) a determination has been made by the PCO that the Government is able to obtain unlimited rights in technical data and computer software from the designer/developer to preclude future patent claims and/or copyright infringements.

(2) a determination has been made by the program manager that the items designated for competitive production are not so complex as to require extensive technical assistance from the developer and application of the leader-follower technique, and

(3) a data package cost justification has been provided prior to Full Scale Development that would permit comparison of the total data costs with anticipated benefits to be received.

The second method is Directed Licensing. Directed licensing is accomplished through a special provision included in a contract with the developer source, specifying a firm requirement that the developer license the production of later quantities to another source.

This method is similar to the data package technique in that it involves a transfer of technical data from the designer/developer to another manufacturer, but it also includes some transfer of manufacturing know-how. Under this approach, the developer is normally awarded the contract for first production. However, the requirement for alternate source licensing is included in the development and/or production contract(s). Also, the developer provides engineering and manufacturing liaison to the new production source and receives compensation for this service often in the form of a royalty and/or technical assistance fee. The provisions of the licensing arrangement, including royalty and/or technical assistance fee should be made an evaluation factor during design selection. Those provisions (and the amount of fee) can then be taken into consideration later during selection of the alternate

(licensee) source. Selection of the alternate source may be done either by the government or by the developer (licensor), depending upon the terms established in the initial contract. If selection is to be made by the developer, appropriate provisions shall be included for prior government approval, either of the source or of the selection criteria.

CONCLUSIONS

The following points about IP/IPR transfer deserve emphasis:

1. Industrial involvement is critical to any IP transfer, because without the cooperation of the holder of IPR, IP transfer cannot take place.

2. Stated another way, licensing and disclosure of IP/IPR for NATO purposes must be accomplished with the full participation of the owner of IP/IPR, and that governments cannot legally transfer IP/IPR which is owned by industry unless this right is granted legally and contractually.

3. In the past, transfers have been primarily for mature equipment being produced in the U.S. Transfers at earlier phases of development or production create many different problems and concerns.

4. Because of a lack of fully defined policy and implementing instructions by DoD, it is apparent that past IP transfers have been arranged on a case-by-case basis.

5. The Project Manager and his team are the instruments for DoD to initiate IP transfers. If this team does not consider IP rights and the transfer mechanisms early on, IP transfer becomes much more difficult and expensive. The PM must be fully informed about NATO-developed equipment that can meet his approved requirements, especially if the equipment is related to a European scenario.

9. ENGINEERING MANAGEMENT AND TECHNOLOGY TRANSFER

INTRODUCTION

The process of international cooperation has an integral element, the transfer of technology among the partners in a cooperative process. As such, there is a need for the program manager to understand, 1) the process by which technology flows from one partner to another, 2) some of the differences in the practices of engineering management between the U.S. and Europe, and 3) some of the problems which arise in the areas of engineering and technology. This chapter is organized along these lines. The end objective of the engineering process is a complete definition of the design of a system which will represent the most cost-effective set of physical, performance and logistics parameters required to meet the operational need and postulated threat. The harmonization of the threat and need is discussed in Chapter 3 on RSI Planning Systems.

This chapter of the guide will be concerned with establishing a baseline for considering the engineering management issues in multinational programs. The underlying thesis in this chapter is that the process of system engineering utilized in the U.S. defense establishment represents a viable method for developing weapon systems that have the requisite capabilities of meeting the needs of the operating forces. This chapter also provides a basic framework for defining the issues that must be addressed in the cooperative development environment. The process of technology transfer is an integral part of codevelopment, coproduction and licensed manufacturing. In this chapter, the term "technology transfer" is used except when the other terms are more accurate.

CONCEPT OF TECHNOLOGY TRANSFER

Technology Transfer is the process of transferring, from the industry in one country to another or between countries, technical information relating to the design, engineering, manufacturing and production techniques for hardware systems using recorded or documented information of a scientific or technical nature. It normally does not include the transfer of common reference documentation such as military standards, specifications, handbooks or commericial counterparts to these documents. It is important to note that use of these non-included documents may be critical to the successful understanding and use of the transferred data. Consequently, the industry or country receiving the transferred technology should assure that these types of documents are identified and that they are obtained for program use.

The process for transfer of engineering functions in cooperative research and development (R&D) for weapons system harmonization, codevelopment and possible coproduction is painfully slow. Engineering experience and expertise is not transferred by transmittal of a technical data package (TDP) alone, but requires considerable interchange, liaison, and face-to-face meetings if design responsibility is to be assumed by the gaining country/contractor(s). This section identifies the process for transitioning engineering management responsibilities as well as the review process to ascertain that engineering considerations are understood. The engineering considerations in the transfer

strategy must include item complexity, service technical requirements, critical technologies, equivalent parts and materials selection, and equivalent production processes.

When addressing the topic of technology transfer, it is important to recognize that the flow of technology from the United States to other countries is only one side of the issue. It is also necessary to look at the flow of technology into the United States. The imbalance of technical sophistication between the United States and Europe which was seen by many observers during the last thirty years is being replaced by an assessment which sees growth toward balance. In many areas, the European countries have a technological capability at least equal to that of the U.S. In our treatment of the topic we will take a generic view of the technological flow and introduce some of the considerations which become of significance in managing a program involving transfer.

The DoD policy relating to the licensing actions required for technology transfer should be understood by the program management personnel who will be involved in the transfer process. DoDD 2000.9, International Coproduction Projects and Agreements between the U.S. and Other Countries or International Organizations (23 Jan 74), authorizes licensed coproduction by a foreign licensee after a prototype has been selected for procurement. However, the license agreement may be entered into prior to prototype approval. This directly covers foreign production of U.S. weapons, communications or support systems or military items. At the time this guide was written, a revised DoDD 2000.9 was in the process of being coordinated. The policy in the revision reflected that provided in a memorandum from the Deputy Secretary of Defense, dated May 7, 1980, Subject: Licensed Production by NATO Allies. The memorandum encourages licensed production of U.S. defense equipment by NATO allies and directs the DoD components to pursue opportunities for licensed production programs.

The Packard Memo (Subject: Licensing Agreements between U.S. and Foreign contractors on Foreign Developed Items, 1 Nov 71) states it is DoD policy not to discourage or to inhibit industrial working relationships involving the import of foreign technology. Although the memo encourages contractor-to-contractor license agreements, it does not preclude either government-to-government or government-to-contractor licensing agreements. This policy was emphasized and refined in a memorandum from Dr. Perry (Subject: Cooperative Development and Procurement of NATO Armaments, 21 Nov 1978). This memorandum encouraged dual production run developments already completed (or soon to be) so that the best developments of one NATO country are available to other NATO forces at low unit cost. There are then three potential sets of pairings for technology transfer: government-to-government, government-to-contractor and contractor-to-contractor. Each of the approaches has with it certain benefits and shortcomings. Hence, the program manager must decide whether his program objectives will be met best by having the Government or contractor enter into such agreements.

Foreign Government to U.S. Government Licensing Agreements

Prior to entering into foreign contractor to U.S. Government agreements, the U.S. Government must determine whether some or all of the information and support necessary for technology transfer is already available

from the foreign government under an existing agreement. The new agreement should specify that the contractor will not restrict the foreign government from furnishing data in its possession to the U.S. Government. This provision is needed since foreign countries generally do not acquire a right to pass their contractor's data rights to a third party, such as the U.S. Government. For instance, Germany only reserves the right to use resulting work, and allows the contractor to retain proprietary rights.[1]

Government-to-government licensing agreements are appropriate for government-developed systems which are produced at government-owned facilities. Such agreements may not be sufficient if the manufacturer has proprietary data for the required system. Since the data must ultimately be obtained from the developing contractor, entering into an agreement with the foreign government introduces a third party communication problem, thus resulting in greater difficulty in understanding what is required and how changes will be handled.

Some MOUs have required each of the participating countries to provide license rights to the others. For instance, an addendum to a government-to-government MOU for the ASRAAM/AMRAAM[2] program specified that it is the intention of both parties to exchange data and license rights on standardized items under fair and reasonable conditions. To accomplish this, the MOU states that each government, in its contracts, will include provisions requiring its contractors to enter into agreements to transfer such technical data expeditiously under fair and reasonable terms and conditions. The MOU also recognizes that such data should be obtained by either the U.S. or foreign government or its contractors directly from the foreign or U.S. developing contractors.

Foreign Contractor to U.S. Government Licensing Agreements

Such agreements preclude a foreign contractor from establishing a "sole source" U.S. manufacturer of the required system as may happen under a contractor-to-contractor agreement between foreign and U.S. contractors. These agreements often specify that the licensee was granted the exclusive right to manufacturer the system, and the right, to the exclusion of all others except the licensor, to sell the system to the U.S. Government. Thus, the U.S. Government may lose control over the selection of its contractor and be obliged to contract with a U.S. company selected by a foreign entity. One advantage is that only one party, the USG, is seeking manufacturing rights. This eliminates the possibility of a competitive auction, which might occur if several firms were competing. Depending on the eagerness of firms to obtain the rights, such auctions could result in very unfavorable terms to the U.S., because the foreign firm is likely to grant rights to the U.S. manufacturer who is offering higher royalty payments, the cost of which will be passed to

[1]Appling, David A. LTC, "The Looking Glass World of International Programs," Defense Systems Management Review, Vol 2, No 2, Spring 1979.

[2]ASRAAM/AMRAAM = Advanced Short Range Air to Air Missile/Advanced Medium Range Air to Air Missile.

the U.S. government. Another of the primary advantages of such agreements is that the U.S. Government is contracting directly with the developing contractor rather than indirectly through a foreign government. This helps eliminate misunderstandings regarding what data are required, how changes will be handled, and the desired sequence of delivery of data. Also, the U.S. Government is fully congnizant of the program objectives, such as: (1) third country sales; (2) configuration management plans; (3) the U.S Government's ability to acquire data rights at no cost based on a separate MOU with the other government, which has the necessary data rights; (4) any existing resolution of U.S. Government data rights.

The disadvantage to this licensing arrangement is that the U.S. becomes a third party in the data transfer to the U.S. contractor. Hence, the U.S. must rely on the licensor's certification that the TDP is adequate for competition. To "prove" the TDP for initial production contracts, either limited production runs, preproduction proposal evaluation (PPE) or foreign contractor support requirements may be needed which could increase the overall cost of the program. However, the cost increases may be less than those associated with contract modification resulting from TDP deficiencies discovered after contract award.

Foreign Contractor to U.S. Contractor Licensing Agreements

As previously noted, the Packard Memo of Nov 71 encourages these types of cooperative agreements. The primary advantage in this approach is that the two contractors are responsible for ironing out problems associated with the technology transfer necessary for the achievement of RSI objectives. The working relationship established between two or more contractors can be extremely important to the successful completion of a cooperative R&D or production effort. One disadvantage is that the lack of U.S. Government input or influence may require costly modifications. A second is that the licensee may not be able to conduct an in-depth analysis of the TDP prior to entering into the agreement because money is not available to purchase information from the licensor. Another is that the U.S. firm may encounter more difficulties than the U.S. Government in making known U.S. specifications to a foreign contractor because of the security classification. Also, there is no incentive for U.S. contractors to negotiate royalty provisions vigorously since royalty costs normally pass on to the USG.

A final disadvantage is similar to one described for the foreign contractor to U.S. Government agreements. Certain program cost increases are likely to occur regardless of whether the foreign manufacturer enters into a licensing agreement with the U.S. Government or a U.S. contractor. An example is the area of data transfer problems such as those associated with verification of the TDP. While the U.S. manufacturer is responsible for solving these problems, it must be recognized that the U.S Government will be liable for the additional program cost if the prime contract is cost reimbursable. On the other hand, for fixed price contracts, the contractor will be reimbursed only for the portion of his efforts on those data transfer problems whose costs were originally reflected in his contract price.

PROCESS OF TECHNOLOGY TRANSFER

The first step required in the process of transfer is the licensing agreement which generally provides for a technical data package (TDP) and technical assistance for the licensee to produce a portion or all of the system to the performance standard achieved by the licensor. Normally, translation of the TDP is left to the licensee or contracted out by the licensee. Translation by the licensor may be desirable, however, if one central source is transmitting the technical data to several sources. However, because of the learning required for translation of technical material, the amount of translating service used should be restricted.

The initial TDP will be transferred by the licensor to the licensee per the license agreement. The PM office should accomplish a pre-transfer evaluation of the procedures to be utilized and the quality of planning of both the licensor and licensee. As the transfer process proceeds (See Figure 9-1), the licensee will need clarification and technical assistance as the drawings, parts lists and processes are analyzed prior to initiation of the manufacturing processes. Valuable time may be wasted if adequate liaison is not established for the technical "pull" of data from the licensor. Based upon experience gained on several European-to-U.S. transfers, the specifications will have to be reissued in American English and the engineering drawings will have to be annotated to provide instructions the shop personnel will understand during fabrication and assembly. The metric measurements may be retained.

In some cases, foreign designs and end items, while exhibiting excellent performance and acquisiton cost characteristics, display a variety of technical, software, safety and logistics deficiencies because of a different concept of design control. During the technology transfer and critical design review processes, continued emphasis will be required to ensure the following:

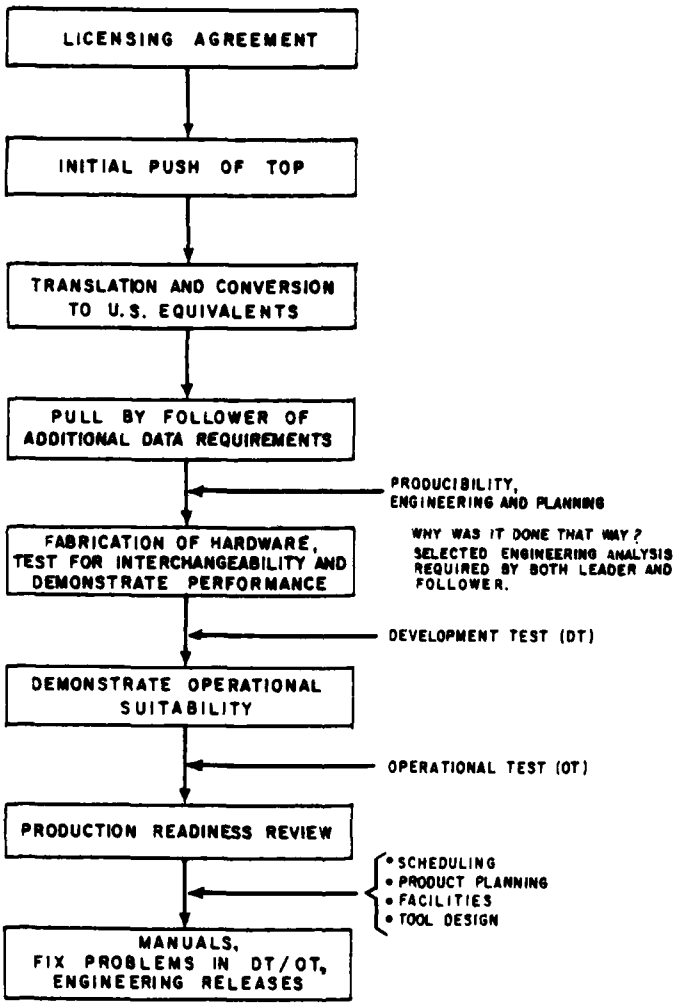
- Foreign designs and equipment have a baseline management and configuration control system in being. If they do not, one must be established at the start of the transfer process.

- Foreign software programs have a baseline management and configuration control system instituted early-on. The languages used must be acceptable to the U.S. program manager and the software programs must be fully documented and meet standards for quality, terminology, and symbology.

- Trade-off analyses are conducted as part of the assessment of the baseline system to assure producibility of the equipment, human factors engineering for operator interface and maintainability, reliability of critical components and logistics supportability.

- Interoperability/standardization is maintained at the level required. The discipline imposed by the Logistics Support Analysis Review (LSAR) is appropriate for structuring this assessment and providing a baseline management and configuration control system.

FIGURE 9-1. TECHNOLOGY TRANSFER PROCESS



European contractors, who generally are allowed to retain the intellectual property rights by their governments, must be required as part of the licensing agreement to deliver sufficient documentation of the equipment for production engineering to be accomplished and for support purposes. The licensor may be financially motivated to assure a thorough and efficient flow of data and a successful technology transfer by coupling license payments to major program milestones such as the successful completion of Development Testing/Operational Testing (DT/OT), award of low rate initial production (LRIP) contract, and award of full production contract. Alternatively, the bulk of licensor's compensation could be in royalty payments on units produced so that the licensor as well as the licensee both work for a successful production program. The issue of intellectual property rights is discussed in Chapter 8 of this guide. The importance of assuring that adequate rights have been defined and acquired cannot be over emphasized. Where the technical information is to flow from the U.S. to another country, the impact of the critical technologies must be taken into consideration as well as any export clearances which may be required.

If we return to Figure 9-1, some points need to be addressed. The licensing agreement can take many forms. If a U.S. system is a candidate, the U.S. Government or manufacturer may be the licensor and the foreign government or a selected foreign contractor the licensee (coproduction). Conversely, if a foreign system is the candidate, either the U.S. Government or a proposed contractor can enter into negotiations for license rights (licensed production). The terms of licensing agreements proposed between the U.S. and foreign firms or governments, should be coordinated with those agencies of the U.S. Government who may be involved with such issues as export licenses and release of classified information. Where the agreement will involve intellectual property rights, the owner of those rights -- either in government or industry -- should be consulted prior to signature of the agreement. These actions can prevent the PM from promising, in the licensing agreement, things that cannot be delivered or which will require long flow times for approval.

Action on the licensing agreement should start early. Negotiating the agreement and obtaining necessary approvals may take months. The project manager (PM) is responsible for furnishing complete information and advice to the negotiating team regarding desired license terms and provisions. Costly program delays and modifications are likely to occur if the proposed agreement must be modified to incorporate additional terms. Although the terms and conditions included in licensing agreements will vary, some are required in all agreements. The information that is presented below can be used as a basis for gathering information or forming a position on issues relating to engineering management and technology transfer to be communicated to the negotiating team.

Because of language differences, problems can arise in interpretation of the agreement. Different meanings are often given to well-defined words and phrases, which may even have legal definitions. For instance, there is no legal definition of the term 'know how" in Italy. To avoid misunderstandings, common terms should be defined. Appendix G contains definitions of many of the significant terms used in this guide based on other glossaries developed for acquisition and NATO use.

MULTINATIONAL IMPACT ON SYSTEMS ENGINEERING

Standardization and Specification

The design process is an economic and culturally derived process which reflects the military, economic, industrial and engineering environment of the society. Consequently, it is natural to expect that there will be differences between the process as practiced within the United States defense community and in collaborating European countries. The material items which are the end product of the process are designed to meet the European combat needs and reflect the philosophies, industrial capacities and capabilities of European industry. An example may be France where equipment must also be designed for third world requirements.

When the United States views a foreign developed item or portion of a defense item, and determines that the equipment is basically desirable and fulfills a genuine U.S. need, it will have been evolved in a completely different military, cultural and social environment, and as such, will contain significant differences in approach to utilization, maintenance, logistics, part selection, and the like. For desirable military, economic and political reasons, full adherence to U.S. military specifications and U.S. military regulations should not be expected. Military specifications and regulations have been evolved to aid in the U.S. development of new weapon systems for the U.S. military. Their general use is effective in that environment. Other nations have evolved procedures which are also adequate for the development of useful, new hardware; however, these procedures are considerably different from those used in the United States. We cannot reasonably expect that a foreign developer would use U.S. military specifications and regulations exclusively in the development of a system. It should be noted that many European national specifications and standards have been derived from U.S. military specifications; therefore, at least a limited application of U.S. military specifications and regulations can be expected.

The PM needs to identify all applicable NATO Standardization Agreements (STANAGs), ABCA Quadripartite Standardization Agreements (QSTAGs), Navy Standardization Agreements (NAVSTAGs), and Air Standardization Coordinating Committee (ASCC) Air Standards as they are related to his program. These standards should be identified in the appropriate implementing MIL-STD's and MIL SPEC's (Military Standards and Military Specifications). See DA Pamphlet 310-35 for the listings of agreements, standards, and related U.S. military implementing specifications and standards. The section in Chapter 12 on Product Assurance contains more information on STANAGs including addresses for obtaining them.

Military specifications and military standards generally fall into two broad categories: those that are a requirement on the design or the design process and those that impose requirements on the test process. Specifications controlling the design can be divided into the following eight major categories:

- System Performance
- Safety
- Parts, Material, and Processes

- Environmental Requirements
- Maintainability
- Reliability
- Availability
- Human Factors

Considerable care must be exercised in applying these specifications to a technology transfer program. To apply design requirements which are different that those used in developing the existing foreign design or which cannot be conveniently and inexpensively obtained defeats one of the primary purposes of technology transfer. On items such as system performance and safety, at best the design can be analyzed to determine the extent the European or other foreign design meets the U.S. requirement. The PM must be extremely careful in this area, particularly on specifications which relate to personnel safety. It must be recognized from the outset of the program that certain U.S. safety standards must be applied to the system (e.g., no-fire current rating for electro-explosive devices, the use of carcinogenic materials in manufacturing processes, noise environment during operation) and that a certain amount of redesign may be required to meet these statutory requirements.

In the general coproduction and licensed manufacturing process, essentially no changes are made in the design. The only differences result from the conversion of the parts, materials, and processes. Any changes to these can influence such items as system performance or reliability. Therefore, specifications that deal with system characteristics which can be influenced by the selection of parts, materials, and processes are appropriate to require in the contract, but only to the extent that no redesign is required. These specifications could cover such items as corrosion prevention, reliability, and national standardization. On the other hand, applying specifications on maintainability, where the maintainability aspects of the sytem are already defined in the design, are of little value.

The U.S. DoD normally does hardware validation and verification through an extensive test program. Service regulations require this on every weapon system procurement. In a technology transfer situation, however, some performance testing may already have been conducted in a foreign nation and some of the design verification and validation completed. Therefore, considerable time and money could be saved if a particular development or operational test in the United States is not required when the equivalent of that test has already been performed in Europe. It is important that both the development test agency and operational test agency participate in the review of testing which has already been conducted by the foreign developer/user to assure that the results will be accepted as a part of the U.S. data base. Also limited performance testing and environmental verification tests should be accomplished to amplify the foreign testing and to verify that the technology was completely transferred so that the hardware as constructed in the U.S. contractor's manufacturing facility performs as the hardware constructed in the foreign nation. In addition, the U.S. logistics and personnel subsystems must also be tested with the U.S. built equipment to insure compatability.

These issues are further discussed in Chapter 11 on Foreign Weapons Evaluation. Because of this additional testing, the technology transfer process falls somewhere between a second source and a regular Research, Development, Test and Evaulation (RDT&E) program.

A study should be performed on each program to outline the applicability of military regulations and specifications to the technology transfer program considering the above factors. Procedures for executing a technology transfer program should be defined and applied. These procedures should consist of the adaptation of existing military procedures, specifications, and requirements to maximize the utilization of the foreign technology and the foreign test experience. This will reduce the cost of weapon system procurement by the U.S. military. Foreign governments have used such a system in the procurement of U.S. supplied weapon systems in the past and a great deal could be learned from them. The objective of these procedures should be to provide the military with a system that is substantially in its present form. This would minimize the cost associated with revalidation and redundant testing.

The program manager should determine the degree of international standardization to be obtained vis-a-vis the degree of national standardization among other U.S. military weapon systems. At the present time, European and U.S. standardization practices are not the same. Therefore, the U.S. program manager must be prepared to accept some increases in life cycle costs in order to obtain international interoperability. The PM must reflect on the need to achieve interoperability and interchangeability of critical modules before complete standardization, especially if standardization would raise life cycle costs significantly.

Requirements Definition

As we evaluate designs, it is also important to recognize that the design for a weapon system evolved by a particular country is driven by a number of issues including the threat, the national tactics, the expected time available to counter the threat during battle, the philosophy of equipping defender forces and the capability of the national industry that will develop and produce the sytem. Although differing equipment requirements do not necessarily preclude multinational cooperation in weapons development, they can have detrimental effects on collaborative projects and may reduce the participation in such projects. In certain cases, joint development projects result in more expensive equipment because of the need to accommodate muliple national preferences. The result may be a more complex piece of hardware than any single nation desired.

The process of requirements definition requires reconciliation and compromise. In the multi-national environment there may be a need for compromise in requirements in order to secure program approval. In a great many instances, the agreed technical specifications for specific European codevelopment systems are compromised to a greater or lesser extent in order to secure the participation and approval of the prospective collaborators. The Transall transport represented a compromise of the French need for a cargo aircraft capable of supplying remote Asian or African stations occupied by the French in the late 1950s and a German perception of need for an aircraft to carry dense military cargos to German forces positioned to defend Western

Europe. The product was a transport which only with great difficulty could operate in the close confines anticipated by the Germans, and which was incapable of carrying useful military loads over the ranges desired by the French.[3] It is also important to know that many issues outside of typical cost/effectiveness concerns may control the choice of subsystem options. This may result in a certain inhibition of later product improvements since one country's perception of an improvement may be seen by another as "gold plating." Another area in which performance may be impacted proceeds from the interrelationship of commercial and military technology. In order to maintain a commercial edge, companies may withhold from multinational ventures advanced technology and use it only in their national programs.

The appropriate international forums for the discussion of differences in requirements doctrine, tactics, and threat include the Periodic Armaments Planning System, the NATO main armament groups, and the bilateral staff talks. These forums provide a systematic means for converting national military mission needs into harmonized equipment requirements. The essential ingredient in this process is assurance that frank discussions and understandings on requirements take place early enough to learn if there really are differences that cannot be reconciled. Refer to Chapter 3 for the PAPS/NAPR discussion.

In negotiating the weapon system requirement, agreement must be obtained on the threat scenario and on the mechanism to translate that scenario into an operational concept for the weapon system. Often, nations are reluctant to discuss fully the threat because of the intelligence implications. Where more than one country is involved with the development of the system, the mechanism for communication of the interface requirements must be clearly described and it must represent a workable concept.

There also needs to be specific agreement on the management concept to be utilized. If there is to be an integrating contractor, what will be his responsibility? And how will he be selected? There needs to be a clear description of the relationship between the governments involved and the industry which will develop the system. Where technical data must flow across national borders there needs to be a clear specification of the types of data and rights to be transferred, the process by which they will be transferred and the responsibility of both parties. The subject of Intellectual Property has been treated in Chapter 8 of this guide, but we need to re-emphasize the critical significance of the identification of required data rights and the transfer of these rights.

System Design

The difference in European and U.S. objectives in cooperative developments can also have a significant impact within the design phase of the project. Fundamentally, the product design should reflect the decision as to the most cost-effective set of physical, performance and logistic parameters required to meet a postulated threat, but system design is also a political and economic issue. Any given design tends to determine who is to gain certain benefits of the system and how much, and who is to have predominant control.

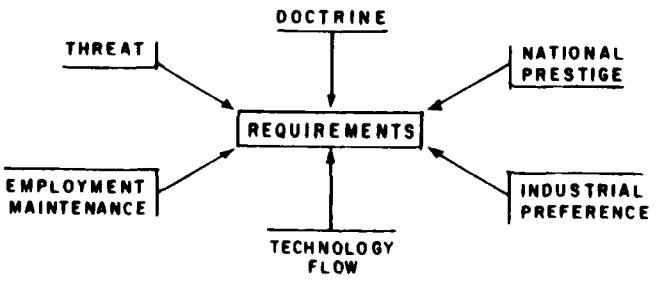
[3]Perry, Robert, Multinational Acquisition: An Overview Report Santa Monica, California: RAND Corporation, July 1980.

The design of a system tends to dictate who will use it, who will be able to bid on its production, and which companies will have comparative advantages in coproduction. The keen interest of national governments in getting an equitable share of a project's production makes the design of the system a crucial decision. Each government may try to make certain the equipment its industries produce more efficiently (or uniquely) is incorporated in the system, and/or that technology its companies want to obtain is to be transferred to local producers. Decisions on technical questions become, in effect, political decisions. But frequently political decision-makers are ill-prepared to make technical decisions, and technicians are unable to make political decisions. Decisions become really technical only if purposes, system design, users, and benefits have been clearly delineated in the basic MOU, leaving just "how to" questions to be resolved by technicians.

ENGINEERING CONSIDERATIONS IN DESIGN

Starting with the initial negotiation of agreements and continuing through the design and/or transfer process, a number of constraints become operative. As we look at the individual countries involved, we find that there are generally differences in requirements, specifications, drawings and manufacturing processes. This is to be expected since all of them are influenced by the national cultures which have great degrees of divergence. The influence of threat was discussed above. The specific system requirement is driven by a number of other issues in addition to the threat. Figure 9-2 seeks to identify some of the potentially more significant motivators of system requirements. During the negotiation of system description, it is important for the program manager to try to identify those issues which motivate the requirements definition as a prelude to achieving that definition which has the greatest likelihood of satisfying the overall requirements of the U.S. and NATO forces. Since requirements tend to be the primary driver behind the engineering design, a reasonable requirements definition is a necessary precursor to a rational design.

FIGURE 9-2. FACTORS MOTIVATING REQUIREMENTS



Drawing Conventions

The experiences of the U.S. Roland program illustrate some of the differences in design engineering practices between the U.S. and Europe. There does not exist among the European contractors, a drawing convention standard such as is applied to U.S. contractors by MIL-D-1000. Roland has thirteen major subcontractors each with its own drawing practices. The data

received from Europe prior to the contract award did not reveal the considerable differences in these practices. The drawing transfer task required that most of the drafting room manuals for each European subcontractor be acquired and understood to enable proper drawing conversion. In future programs, Hughes, the Roland lead contractor, recommends the European drafting room supervisors spend two weeks to one month at the U.S. contractor facilities reviewing the received drawings and documentation to permit a more rapid and efficient conversion to U.S. drawing practices.

A further current European drawing practice that causes difficulty in a technology transfer, fabrication and test (TTF&T) program is the lack of a complete indentured drawing list (IDL) (i.e., a drawing tree from the top assembly down to each bit and piece) until the Europeans are well into their low rate initial production (LRIP) phase. This practice may require the U.S. contractor to generate the document to understand the interrelationship between all of the drawings and documents received. This initial lack should be anticipated in future foreign procurements, and provision for U.S. contractor generation of an IDL included in the contract, if required.

One facet of the technology transfer task which has continued to bring dividends to the Roland program concerns a visit which was made prior to contract award to each of the major European subcontractors. This visit provided the opportunity to discuss in depth with each equipment designer the meaning expressed by the terms of the license agreement as to what truly encompassed European "know how" to be transferred to the U.S. This face-to-face communication covered all aspects of engineering and tooling data, quality control procedures, and proprietary processes used on the program. A permanent liaison office was later established in Europe and European personnel were assigned to the U.S. contractor to continue these close working relationships. The NATO Airborne Early Warning and Control (AEW&C) Programme also cited the importance of the development of these types of relationships. Chapter 12 of this guide on Manufacturing and Production discusses in some detail the problems involved with the manufacture of equipment involved in a technology transfer program. It also discusses some suggested mechanisms for achieving effectively the objective of establishing viable manufacturing capability on equipment.

Roland Experience

The following contains additional detail relative to experience in the transfer of Roland technical data.

Document Estimates. There was confusion at Hughes in estimating the total quantity of documents involved in the technology transfer process. Page counts were at times confused with drawing and specification counts. For example, 100 drawings or specifications may be made up of 300 separate sheets of which 150 sheets are text requiring extensive translation and the other 150 sheets are line drawings requiring very little translation. In addition, the data estimate must be against specific predetermined system elements (prime or support); e.g., it was not always clear if the Peculiar Support Equipment (Organizational and Field Maintenance Test Equipment) and the Trainers were included in the document count. Detailed and consistent questions should be asked on this subject during the early phases of the transfer process.

Data Shipment Priorities. Drafting Room Manuals (DRMs) of each foreign company should be requested along with their drawing conventions, numbering, usage and correlation. This information should be given to the draftsmen and engineers involved in the transfer process. DRMs, operating procedures, European military and industry specifications, and top system documents should be the first items transferred. (Note: Some of these documents consists mostly of text pages which require a great deal of time for translation.)

Missing Data. The Roland problem with missing data resulted primarily from not understanding adequately the European drawing systems. Some data were identified as missing during the first six months of the data transfer. Originally, missing data were requested of Euromissile by the data center at the central receipt point; however, this put an extremely large work load on the undermanned licensor (Euromissile). In this situation it was found that the best way to alleviate this problem was to have the person in the project, with the need for the data, communicate directly with the person in Europe having the data.

Another area of misunderstanding was that the 13 participating companies in Europe did not use the same drafting conventions. Most of the European drawings contain a prefix (code) to identify the type of drawing (e.g., parts list, schematic, assembly, etc.). If the definition of these codes is known to the licensee, then the data transfer task is simplified. After it was learned specifically how to ask for a data item, the European companies could tell precisely the various types of drawings that related to a given subsystem or assembly.

Data Liaison in U.S. and Europe. Provisions should be made for having data handling liaison in Europe and the United States done by working level people who know exactly the content of each shipment. They should participate when the data are being packaged for shipment to the United States and subsequently unpacked for use in the U.S.

Translation. A translation subcontract was executed at the beginning of the U.S. Roland contract. During 1975, over three million words were translated. The major problem was the inability to predict the translation workload. The number of translators used varied from four to twenty-four, depending upon workload. Most of the project areas developed expertise in translating drawings and short texts. However, multipaged text documents are done best by professional translators where editing and typing skills are employed as well as foreign language translation.

Data Receiving Activity. A procedure which worked very well was to have all of the transferred data addressed to a Hughes central receiving point in the United States. Using one customs broker allowed Roland to establish a working relationship wherein Roland data were readily identified and processed through U.S. customs.

Conversion. A major issue in any technology transfer program concerns the conversion of electrical and mechanical parts, materials, and processes. At this time, very limited European-to-U.S. parts conversion lists exist. Without such conversion lists, it is necessary that an in-depth understanding of each part be obtained to enable a proper conversion. Such

understanding permits a U.S. equivalent item to be substituted. Accomplishment of this task requires the obtaining and translating of many European specifications. Because there were over 15,000 different type parts, materials and processes on Roland, this task required significant time and resources since the percentage of parts for which an equivalent U.S. MIL-Standard item existed was less than expected, 60% versus 90%, although the expected total quantity of parts, 66,000, closely matched the actual quantity, 68,230. Nonetheless, 99% of these parts were converted within the first nine months of the program. It should be noted that NATO and also France have begun developing a list of parts that is applicable for foreign military programs. At some point of time in the future, when these European parts lists are fully developed, the parts conversion task on a TTF&T program will be greatly simplified.

The above issue on parts does not apply to materials and processes found in the European systems. Almost all materials specified in the European drawings are available in the U.S., except all standard stock sizes were different. In addition, it was found that the manufacturing processes specified in Europe have almost all been derived from a U.S. MIL-Standard process. Thus, the conversion from the European process to the corresponding U.S. process, with a few exceptions, was a very direct and straight-forward task.

Manufacture in U.S. The original objective of the Roland program was to establish the total capability for manufacture of the Roland Weapon System within the U.S. by having all the materials and parts produced in the U.S. As the program evolved, it became apparent both to the U.S. contractors and the Project Manager that achieving this objective during the TTF&T program would require a high initial investment in tooling and implementation costs. As a result, the following alternatives were considered:

a. U.S. manufacture for all TTF&T and production requirements.

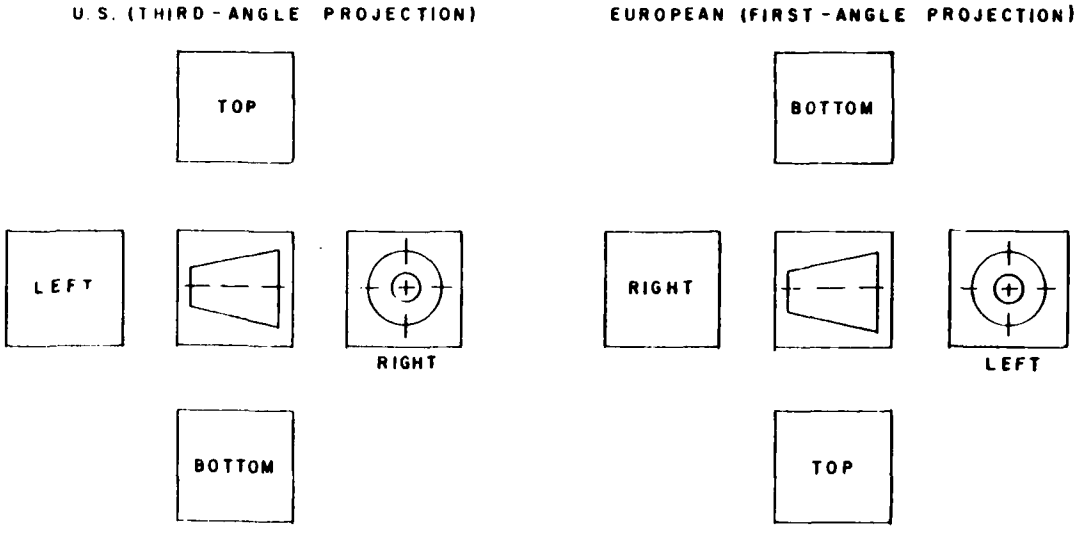
b. Procure initial hardware requirements from Europe and later convert to U.S. manufacture in the production phase when tooling and implementation costs would be amortized over larger quantities.

c. Procure all hardware requirements from European sources.

Alternative b. was considered for only a limited number of parts to preclude a necessity for extensive retest and requalification after the start of production. Alternative c. was limited to those cases where it was clearly more cost effective to procure parts directly from Europe and where there was low technical risk associated with a subsequent establishment of a U.S. manufacturing source, should a future need arise. Hughes recommends that for future TTF&T programs, the DoD allow parts to be procured in Europe where none exists in the U.S., or where exorbitant tooling costs are involved, and suggests that, if required, the U.S. equivalent parts be incorporated in LRIP or the production phase where the tooling costs can be amortized over the production quantities.

Drawings. One facet of the technology transfer which has been found to be less of a manufacturing problem than originally estimated was the use by the U.S. manufacturing organizations of European drawings having first-angle projections versus the common U.S. third-angle projection convention, see Figure 9-3. The equipment that has been manufactured to date from these first-angle projection drawings has been correctly fabricated and assembled in a straight-forward manner.

FIGURE 9-3. DRAWING CONVENTIONS



Metric System. A further element of the technology transfer task which was adequately foreseen and understood is the fabrication of Roland in the metric system. Prior to the contractual award, the problems of manufacturing European equipment in the U.S. were examined by selecting a complex electronic subsystem of the surveillance radar antenna folding mechanism, and building these units in the U.S. in the metric system from European prints. No difficulties were experienced and the finished units satisfied their performance requirement. Similarly, the assemblies and units which have been fabricated to date have borne out the precontractual metric conversion plans and procedures. Therefore, anticipated problems with the metric system turned out to be easier to handle than expected.

Other Design Conventions. In general, the differences between items which are "national" in nature; e.g., vehicle safety requirements, prime power, communications, and Identification, Friend or Foe, have been relatively easy to accommodate. One major issue which arose on the Roland program concerned whether to convert the European system prime power from 50 Hz to the U.S. standard of 60 Hz. A study was performed on the changes that would be required for this conversion. After a careful review of the alternatives and the impacts, both in the support equipment and in the field, the Army and the contractor jointly agreed to retain the 50 Hz prime power capability.

There are also variations in the design to concepts as they have evolved in the European environment compared with the U.S. Again drawing upon some of the Roland experience, Figure 9-4, below, contrasts the U.S. design to and practices for a number of areas with the European approach for the Roland design.

FIGURE 9-4. U.S./EUROPEAN ENGINEERING APPROACHES

Item	U.S.	Europe
Shock[4]	100G	20G
EMIC	Near Nuclear blast	Nominal
Maintenance	Internal	Contractor
Support Equipment	Designed with prime equipment	Designed after prime equipment
Drawing Convention	DoD-D-1000	Company unique
Identured Parts List	R&D	Low Rate Initial Production
Electronic Components	Derated	Stressed

Logistics

There also are substantial differences in the approach to logistics within the system design task. The program manager needs to be alert to the differences in logistic support approaches in order to tailor the management approach to yield a system which will achieve the target levels of operational utility in the hands of the using agencies. The U.S. approach to the development of the logistics support system involves detailed analysis directed toward the establishment of a relatively well structured support system. In a typical European program there is no requirement for this detailed level of logistics support analysis. Some of this difference can be ascribed to the methods of support utilized. The European approach to support of fielded weapons leans heavily on the civilian infrastructure and industry for depot support. The U.S. generally prefers that its military elements have organic depot maintenance capabilities. Other differences can be found in the approaches to maintenance concepts and training.

CONFIGURATION MANAGEMENT

Another issue which must be addressed on multinational programs is proper application of configuration management (CM) controls by the cooperating contractors and governments.

The depth and degree of CM planning are dependent upon the type of international program but the basic principles should be applied in every case. MIL-STD-480A, Configuration Control -Engineering Changes, Deviations, and Waivers, should be the focal point for CM discussions with the NATO countries and contractors. When possible, it should be referenced in the foreign contract. Since configuration control practices in Europe differ from those in the U.S., frequent discussions with the Europeans may be required in order to reach a common understanding of terms and requirements.

[4] Electromagnetic Impulse Compatibility.

Proposed engineering changes should be classified as Class I or Class II as defined in MIL-STD-480. The class differences must be understood by all levels in both Europe and the U.S. Procedures must be set up for initiating and processing changes. The authority to initiate change proposals must be reached on procedures for the review and evaluation of change proposals. The guidance for evaluation is found in MIL-STD-480. It is particularly important to assess the impact of the change on logistics support and operational characteristics. Approval levels for change proposals should be established both nationally and internationally.

Cooperative R&D programs involving technology transfer and using both European and U.S. manufacturers have peculiar problems of configuration control. For a major weapon system, a joint or international control board cannot meet on every Class I change proposal that is submitted in Europe or the U.S. The process would be expensive and unmanageable with prohibitive delays in implementation of changes. As an alternative in moving toward standardization, the U.S and participating NATO countries should agree to a set of selected components for international control. The rationale is that configuration control of a set of selected items is feasible and will insure a degree of international interchangeability between the U.S. and NATO systems. On the Roland program, items on the controlled list are known as the International Interchangeability (I^2) items.

Criteria that might be used for selecting I^2 components include:

- Items that are interchangeable between all participating countries.
- Items that are replaceable at the 2nd or 3rd echelon of maintenance.
- Items that will be supplied as repair parts by all nations.

The I^2 list should remain fluid and dynamic until the designs of the U.S. and European systems are frozen. After an item is placed on the list, its drawings should be annotated to show that engineering changes may be made only after approval by a joint international control board.

The CM plan should include procedures for processing changes to any item on the I^2 list. The special characteristic of engineering change proposals (ECPs) affecting internationally interchangeable items is that there must be unanimous agreement to implement among all nations to insure that standardization and interoperability are retained. The following describes how a proposed change to an I^2 item might be processed. If the change originates from a contractor in Europe, he may send the proposal to the U.S. contractor(s) for an evaluation of the impact of the change on the U.S. system. Each contractor would forward recommendations to a joint control board composed of U.S. and European contractor personnel. A joint engineering change proposal may then be prepared and forwarded to a joint configuration control board made up of Governmental personnel from the participating countries. In the event agreement is reached, the change could be contractually implemented both in Europe and the U.S. If a decision cannot be reached, the matter can be referred to a higher level control committee. A change which originates in the U.S. would be processed in a corresponding fashion.

A special configuration control system is needed during the period when European technology is being transferred to the U.S. (or U.S. technology is being transferred to Europe) and prior to final selection of I^2 items. This is because the European manufacturer may make engineering changes after the TDP has been provided to the U.S. contractor. Any such changes must be evaluated for possible inclusion in the U.S. TDP. Hence, a configuration control system is necessary to deal with changes originating from Europe. As a general rule, a U.S. decision will fall into one of three categories, either incorporate, reject, or hold until production. If the decision is to incorporate, the ECP is prepared in the prescribed MIL-STD-480 format and processed in accordance with the CM plan. A decision to reject requires concurrence of contractor management and the U.S. project office. The hold decision means that the decision to accept or reject will be deferred until the item is in U.S. production. The procedures are reversed if the transfer is from the U.S. to Europe.

National control boards will be required for engineering change proposals which do not affect items on the international list. Nations may unilaterally decide to implement changes for parts and components in this category. The originator of the change should furnish the change proposal to the other nations for evaluation, but acceptance or rejection is the decision of each nation. Engineering changes of a national type should be held to an absolute minimum, since each unilateral change may have an adverse impact on NATO standardization and interoperability.

It should be noted that the rate of engineering changes received from Europe on Roland was less than expected. The expected change rate was based on U.S. developed systems during a comparable period in the system acquisition phase. The rate is categorized by "changes per drawing per month." As examples, the SRAM program experienced a 0.190 rate; AIM-9 and the F-14 experienced a 0.186 rate, while Roland is experiencing a 0.130 rate. Thus, the normal contractor change control mechanisms and procedures applicable to U.S. programs are proving entirely adequate for management of the Roland change rate.

PROBLEMS IN TECHNOLOGY TRANSFER

This final major section of the chapter will focus on problems which may arise in the areas of engineering management and technology transfer. Where possible, some suggestions are given or experience related which may be of value to the PM in avoiding or minimizing similiar problems. Additional guidance may be obtained from Lessons Learned prepared on programs which have developed experience and understanding of this relatively new area of DoD involvement.

Technical Data

The importance of technical data considerations cannot be overemphasized. Among the factors which require coverage in the agreement are the following:

- Identification of specifications, drawings, and other data.
- Delivery of data. Failure to deliver data in proper sequence can result in wasted effort and expense. A provision to correct

and/or compensate for late or improperly sequenced delivery of data or incorrect data may be considered. Additionally, the licensor is normally responsible for obtaining clearances for export of data.

Warranty of data. The licensor's liability should be specified if the data are not sufficient to enable the licensee to produce the item.

- Payment for other technical data costs. Since the royalty payments may only cover data rights, the licensor should be separately reimbursed for document reproduction, handling, and delivery cost.

- Protection of technical data. The licensor may require limited or nondisclosure of proprietary data; if so, duration of limited disclosure or nondisclosure of data should be specified. The rights of support contractors to use data for analysis of tasks such as program planning and management risk analysis must be specified. (This subject is discussed in chapter 8 on Intellectual Property.)

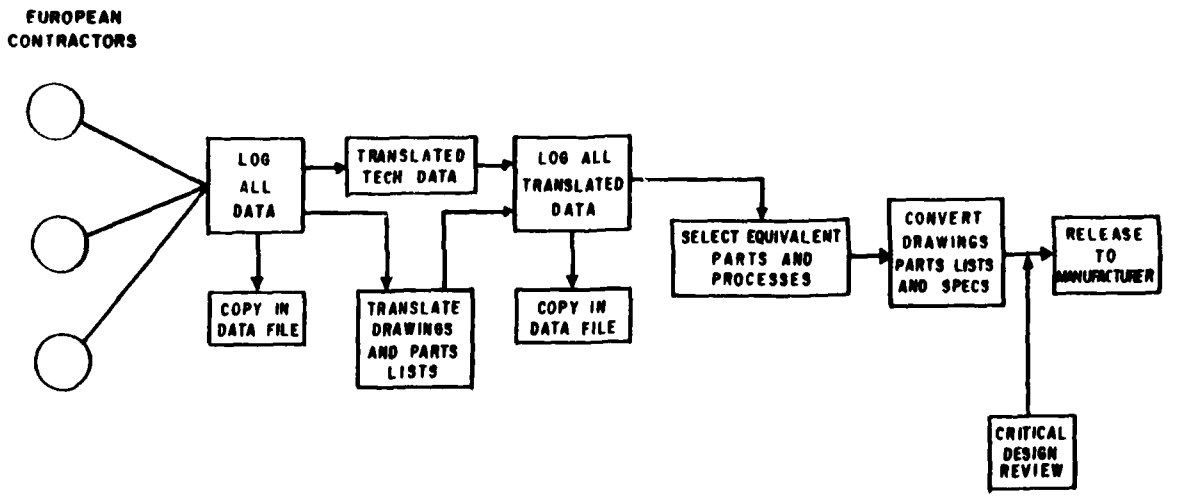
- Technical Support terms. The types of terms which may be included are required access to licensor and licensee manufacturing plants; estimated and maximum technical assistance required; responsibilities for negotiation and payment for technical assistance cost; agreement as to payable cost such as travel per diem, and salary; and identification of personnel visiting each other's plants.

- Engineering changes and improvements. Provisions should be included which specify the obligation of each party to furnish all information and data relating to changes and improvements to the licensed item, time period for acceptance or rejection of change, royalty rights and payment provisions associated with the changes. Such provisions help insure the maintenance of standardized or interoperable items since both parties are aware of the changes and can implement them in their production lines.

- Licensor assistance. It is advisable to include provisions that the licensor will, as requested, use his influence to obtain required licensing agreements from his contractors, procure components and purchase parts from his normal subcontractors; and provide parts and materials he normally produces.

As data flow from the developer to the user, there is a need to manage carefully the flow and use of the data on the part of the receiving company. Figure 9-5 shows a part of the mechanism used within the Roland program to assemble the received technical data for release to the manufacturing functions, but which is generally applicable to any European to U.S. technology transfers. At each step in the process, it is necessary to review the data received to assure that they provide an adequate basis for manufacture. Where this does not hold true, the "pull" of additional supporting documentation is required.

FIGURE 9-5. DATA TRANSFER, TRANSLATION AND CONVERSION



Critical Technologies

Licensing agreements, whether involving the export or import of hardware and technology, may require approval by appropriate government agencies. Three acts are discussed below. The Mutual Security Act of 1954 deals both with the export and import of ammunition and implements of war. The Export Administration Acts of 1965 and 1979 apply to exports only. Further, they pertain only to exports not covered by the Mutual Security Act. The Export Administration Act of 1979 also established the requirement for Militarily Critical Technologies.

The International Traffic in Arms Regulations (ITAR) is the State Department regulation which implements the Mutual Security Act. Section 414 of the Act provides that the President is authorized to control, in furtherance of world peace and security and foreign policy of the United States, the export and import of arms, ammunitions and implements of war, including the technical data relating thereto. The Act further specifies that all persons engaged in such trade must register with the appropriate Government agency. These functions have been delegated to the Department of Treasury for import of munitions list items including technical data relating thereto and to the State Department by Executive Order 10937 for export of such items. The munitions list is contained in the ITAR and includes 22 categories of articles such as firearms, artillery and projectiles, and ammunition. If an item is on the munitions list, an export license is required for its sale, for the granting of the right to manufacture the item and technical assistance pertaining to it, and for the export of technical data related to it. An export license may cover all or some of these categories. As such, the export licensing on a particular program may involve a single license or a series of licenses.

To obtain a license for an item on the munitions list, the applicant (corporation, foreign government, or international organization) applies to the State Department. The State Department requests DoD to formally comment within 20 days on the advisability of granting the license.

Figure 9-6 depicts the processing by the Office of Munitions Control, State Department of an application for export of a U.S. Munitions List commercial article requested either by a foreign commercial purchaser or a foreign government purchaser.

FIGURE 9-6. PROCESSING EXPORTS OF U.S. MUNITIONS LIST ARTICLES THROUGH STATE DEPARTMENT

FOREIGN COMMERCIAL PURCHASER

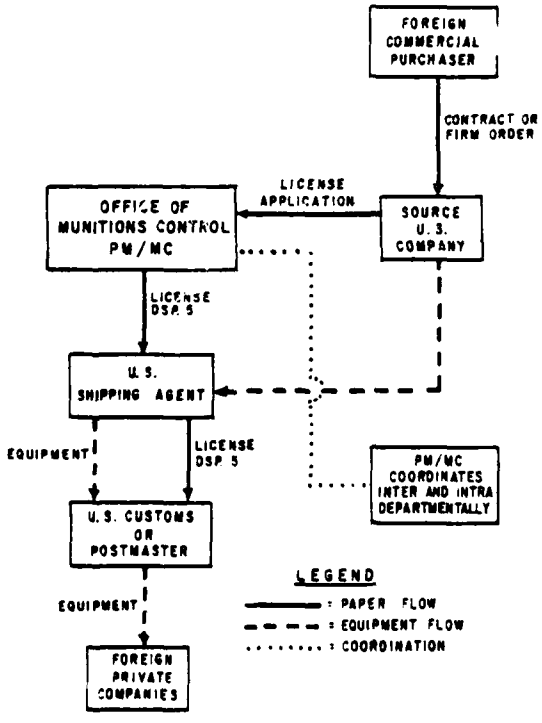
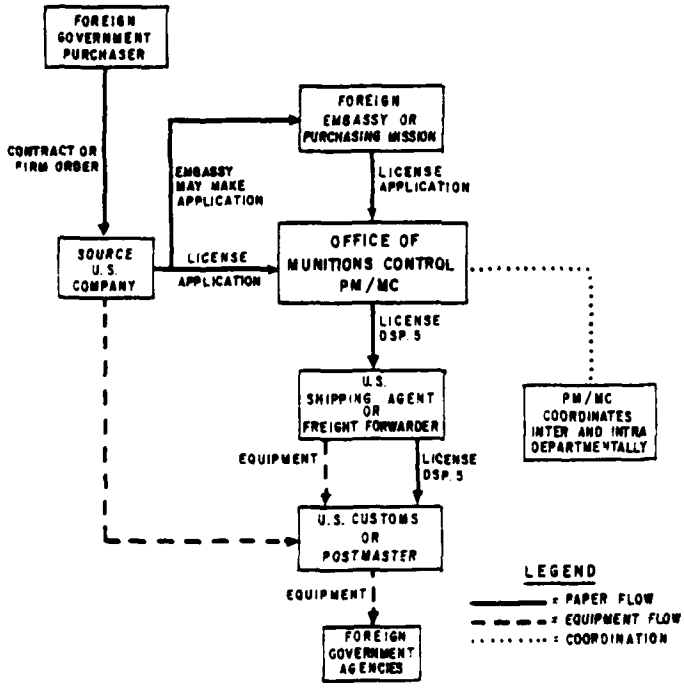


FIGURE 9-6 (Continued)

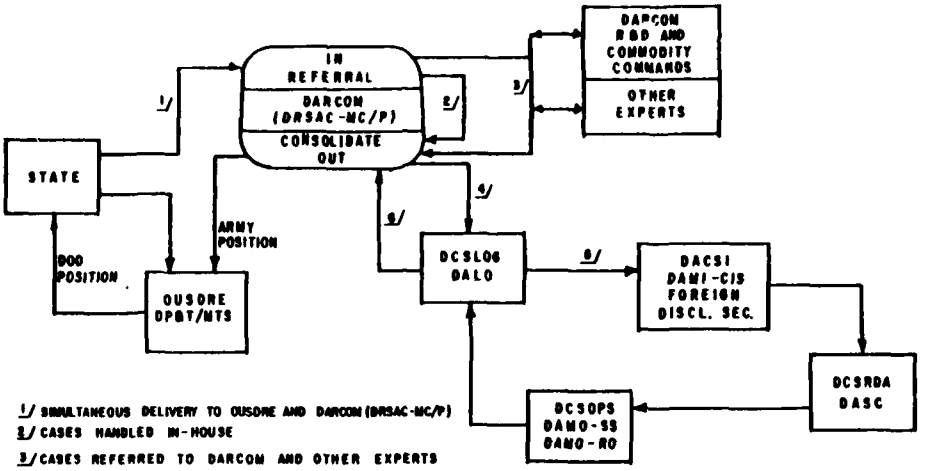
FOREIGN GOVERNMENT PURCHASER



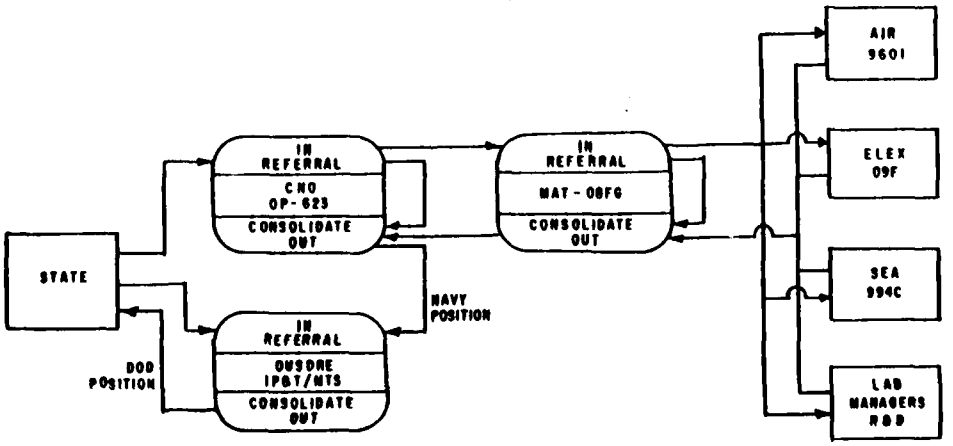
As indicated in Figure 9-6, the Office of Munitions Control, State Department coordinates these Munitions List license requests with the applicable Services in DoD. Figure 9-7 shows the review process used in each Service after receiving a request from the State Department for coordination.

FIGURE 9-7. SERVICES LICENSE REVIEW PROCESS
FOR U.S. MUNITIONS LIST ITEMS

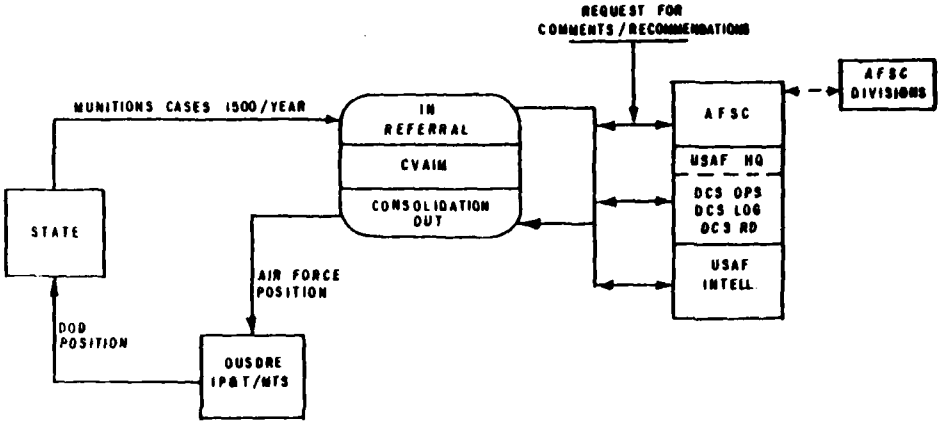
ARMY



NAVY



AIR FORCE



Under the Export Administration Act of 1965, as amended by the Equal Export Opportunity Act, the Department of Commerce has licensing jurisdiction over all commodities and unclassified technical data except for certain specified items handled by other government agencies such as munitions items by the State Department or atomic energy material by the U.S. Department of Energy. The Act applies to the export of commodities and technical data from the U.S., re-exports of U.S. origin commodities and technical data from foreign destination, U.S. origin parts and components used in a foreign country to manufacture a foreign end product for export, and in some instances, a foreign product produced as a direct product of U.S. origin technical data. Export administrative regulations, issued by the Department of Commerce, prescribe licensing procedures for items under its jurisdiction. Controls on the issuance of export licenses are based on considerations of national security, the fostering of U.S. policy and international responsibilities, the necessity to protect domestic economy from excessive drain of scarce materials, and the reduction of the serious inflationary impact of abnormal foreign demand.

The Export Administration Act of 1979 required the Secretary of Defense to generate a list of militarily critical technologies which was to be used to guide the determination of officials who exercised export licensing responsibilities under the Act. The initial list was developed by the Department of Defense, with the cooperation of other agencies of the U.S. Government and U.S. industry. The items on the list identify those elements of technology whose export to potential adversaries could increase their military capabilities to the detriment of the U.S. Specifically, a military critical technology is know-how used for such practical functions as design, manufacturing, utilization, testing and maintenance, in areas of applied science or engineering which have significant military value, whose acquisition by a potential adversary would make a significant contribution to its military potential and thus prove detrimental to the nation security of the United States. The initial list of critical technologies follows:

- Computer Networks Technology
- Computer Technology
- Software Technology
- Automated Real-Time Control Technology
- Materials Technology
- Directed Energy Technology
- Semiconductor and Electric Component Technology
- Instrumentation Technology
- Telecommunications Technology
- Communication, Navigation, Guidance and Control Technology
- Microwave Technology
- Vehicular Technology
- Optical and Laser Technology
- Sensor Technology
- Undersea System Technology
- Chemical Technology
- Nuclear Specific Technology

The index to the list is given in Appendix D to this Guide.

The Initial List and associated index to the list items provides guidance within the DoD for the review of those export license applications that particularly involve the transfer of know how to Warsaw Pact countries. The Initial List is not intended as a control list, nor is it intended as a substitute for or addition to the current Commodity Control List (CCL) or the Munitions List developed under the International Traffic in Arms Regulations. (See Chapter 2 for the most recent legal considerations.) The Initial List does not apply to transfers among the Commodity Committee (COCOM) countries (NATO members less Iceland plus Japan) but can arise as an issue in the approval cycle for export applications, even in the case of COCOM countries, from the standpoint of potential sales or transfers of technology to third-party countries. These issues are explored in greater detail in Chapter 14 of this guide on Diclosure of Military Information.

Another problem which has arisen on a number of programs is delays which have been encountered in the approval process for the technology transfer. Foreign participation in cooperative developments is governed by National Disclosure Policy, International Traffic in Arms Regulations, Arms

Export Control Act, Export Administration Act and other statutory and administrative policies. In developing the program approval documentation, the PM should consider:

- the releasibility of classified information
- the release of technology
- arrangements and agreements for handling intellectual property rights.
- the MOU
- relationships to current and planned foreign military sales cases

If these factors are not resolved early in the program, they may result in problems with technology transfer procedures such as:

- delays in munitions licensing
- conflicts in the transfer of intellectual property rights
- delays in or denials of clearance of classified information for release to foreign governments or contractors
- conflicts with USG commitments made under MOU and FMS cases

The key to avoiding these types of difficulties is to assure that PM or contractor decisions are made with due consideration of the statutory and administrative constraints which apply to the program. There should also be active consultation with the government and industry organizations who will have the responsibility for implementing or approving program information disclosure/release procedures. As much as possible, the coordination should occur prior to entering into discussions with foreign governments or foreign industry. Further guidance on the transfer of intellectual property can be found in Chapter 8 on Intellectual Property.

The policies for the release of classified and unclassified information are covered in Chapter 14 of this Guide on Disclosure of Military Information. The PM should assure that the National Disclosure Policy is well understood within the PM office and the participating contractors. This knowledge is critical in avoiding potentially significant delays in the transfer of classified information required to accomplish program objectives.

STANDARDIZATION ACTIVITIES

As a part of technology transfer, NATO continues to emphasize development of greater standardization, particularly in the materiel and engineering areas. The following section discusses some of the recent activity as contained in the Seventh Report of the SECDEF to Congress on Rationalization, Standardization and Interoperability, published January 1981.

Standardization Group on Assemblies, Components, Spare Parts and Materials

NATO materiel standardization attention is normally focused on major end items - weapons systems and equipment. NATO has recognized that significant advantages would accrue from a more intensified effort to standardize materiel below the weapon systems level. A senior cadre was formed within CNAD to standardize assemblies, components, spare parts, and materials (ACSM). This group has also assumed cognizance of general engineering practices - another key element for achieving NATO goals.

A policy framework has been established by the group to use existing international and national standards as the bases of NATO standards for ACSM items. Major subgroups have been established, covering electrical - electronic items, mechanical hardware, chemicals and materials. These subgroups are analyzing existing international and national standards and developing proposals for modification or adoption by NATO.

Since engineering drawings represent the technical communication among nations for coproduction, maintenance and codification, it is important that each nation be able to read and interpret the drawings of another with a minimum of difficulty. The ACSM group undertook two projects to standardize in this field. First was a NATO guide, published as AS tanP-2, showing how each nation interprets or varies from established international drafting standards. The second document, numbered AStanP-3 but not yet printed, establishes a guide to drawing procedures such as degree of completeness, titling, legibility and recording of data rights. A third project will establish firm standards in the same areas, rather than simply publish guides.

A subgroup developed NATO policies aimed at improving configuration management. The governing agreement, STANAG 4159, "Materiel Configuration Management Policy", is presently undergoing ratification. A second document which standardizes configuration management procedures, is presently under development by the subgroup.

Several other projects under development by the ACSM group are a NATO policy on use of the metric system of measurement and a policy for controlling parts. The present policy which allows products of all nations to be included on national qualified product lists in the electronics area will be expanded to embrace all types of items.

Other Standardization and Specification Efforts

Various NATO groups deal with specifications, including: AC/301; AC/250 (Quality Assurance); AC/135 (ADP Application to Codification); AC/258 (Safety Aspects of Transportation, Storage of Military Ammunition and Explosives); AC/297-WG/4 (Fuels); as well as the three Service Boards of the MAS. Some of the products of these groups are STANAGs, NEPRs (NATO Electronic Parts Recommendations); NETRs (NATO Electronic Technical Recommendations); and Allied Publications.

10. FINANCIAL MANAGEMENT

INTRODUCTION

The purpose of this chapter is to document existing policies, agreements and procedures relating to financial management of U.S. Department of Defense programs with international involvement and to provide alternatives for improvements in financial operations for multinational codevelopment and coproduction programs. These include

- Review of established recoupment, financial management and foreign currency agreements and regulations supporting present international programs.

- Documentation of the collection and disbursement of foreign currencies and analysis of currency exchange operations.

- Development and evaluation of alternatives for financial management and currency exchange.

- Audit by Department of Defense.

The complex financial management and currency exchange operations for multinational programs are to a large measure the product of the negotiations that take place between the U.S. Government and foreign participating governments prior to the signing of the Memorandum of Understanding (MOU) for a particular program. Competition with similar programs from other countries may be intense and may also be based on the economic concessions the competitors are willing to grant. Specific economic concessions have in the past included "not-to-exceed (NTE)" pricing and business offsets on the procurement value of the production, cost sharing relationships, waiver of R&D recoupments, a fixed rate of currency exchange, a commitment for the U.S. to buy a certain quantity and performance guarantees and goals.[1] The program manager must continually exercise his management role of ensuring that the MOU commitments are met. This responsibility encompasses both a need to monitor and assess the performance of the prime contractor(s), and also to plan independently, where required, direct placement of coproduction work; manage cost sharing projects; manage to design-to-production-unit-cost (DTPUC), research & development costs, and operation and maintenance costs; and direct currency requirements. These requirements exist both to ensure adequate contractor performance and to strive to meet program business objectives which the contractor may not share.

Initially, ground rules for the financial procedures for the codevelopment and coproduction effort must be established in the form of cost sharing arrangements and a payment schedule of the required currencies. This is normally prepared by the prime contractor(s) and agreed upon by the participating nations. Agreement must also be reached on interest on deposits by the

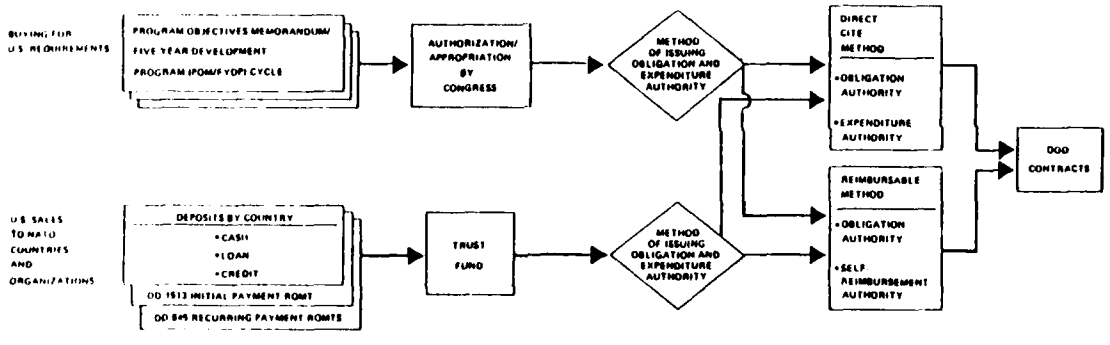
[1] Office of the Under Secretary of Defense Memo, Subj: Pricing Policy as to Foreign Contracts and Subcontracts, 19 Dec 77.

participating governments and the sharing basis for interest earned. Normally, interest is shared on the same basis as the amount of each country's deposits. The financial consequences of missing a payment must be specified in the MOU as well as responsibilities with managing foreign currency transactions and contractual provisions for economic price adjustments.

FINANCIAL MANAGEMENT ASPECTS OF FOREIGN ACQUISITION--BUYING

Under foreign acquisition programs where the DoD is the buyer of a foreign weapon system, the problems and difficulties in the financial management area are disbursement and administration of funds. The top half of Figure 10-1 is a simplified DoD Planning, Programming & Budgeting System (PPBS) and fundding cycle which is the same for either U.S. or offshore procurements. Neither foreign governments nor their firms have the same fiscal policies and regulations and operate on different fiscal cycles. The basic differences, however, apply to methods and procedures to finance acquisitions and to bill for progress payments on material and services.

FIGURE 10-1. FLOW OF FUNDING FOR INTERNATIONAL PROGRAMS



European firms are not normally required by their governments to provide the detailed cost data as required by the DoD. In some cases foreign commercial sources do not have an accounting system that is sufficiently developed to provide these detailed data or are reluctant to disclose such cost data which they consider proprietary. Without adequate cost information, the program financial management personnel cannot meet the requirements to justify expenditures of funds and to justify the reasonableness of program costs (i.e., verification of change proposals). These data are also required by the program office for the data base to develop reasonable cost estimates and forecasts and for devising a sound financial program plan. According to the U.S. General Accounting Office, legal or contractual remedies applied after the fact often yield unsatisfactory results if there has been an initial failure to provide for agreement in such areas as required cost information, fiscal administration procedures, and audit and payment methods.[2]

[2]GAO Report No. B-167034, Benefits and Drawbacks of U.S. Participation in Military Cooperative Research and Development Programs with Allied Countries, dated 4 Jun 74.

The program manager and his financial management staff are responsible for providing the same system for identifying, controlling, expending, accounting and auditing financial resources as for U.S. buys. The PM must assure 1) the identification of mandatory financial management procedures in the MOU, 2) early implementation of cost accounting, auditing & billing procedures as documented in the MOU, and 3) development and analysis of a source cost data base using the contractor's cost data whenever possible.[3] Because no two foreign programs are identical, the PM and his staff must tailor the procedures, auditing support and data base structure to the existing conditions and DoD requirements for each acquisition. The PM must also take aggressive action to initiate definition of problem areas and resolve these issues through annexes to the MOU and in industry-to-industry agreements, and specifically establish the roles, responsibilities and access requirements of participating agencies. The scope and level of records and reporting required from the prime, subcontractors and other vendors must also be delineated.

The principles of Performance Measurement for Selected Acquisitions, DoD Instruction 7000.2 and the Cost/Schedule Control Systems Criteria (C/SCSC) stated in Enclosure 1 of DoD Instruction 7000.2 should be applied where appropriate. The formats for reporting contract performance data and fund requirements should be developed from the standard reporting formats of DoD Instruction 7000.10, "Contract Cost Performance, Funds Status and Cost/Schedule Status Reports," and DoD Instruction 7000.11, "Contractor Cost Data Reporting (CCDR)." The DoD Instruction 7000.10 family of reporting provides information on contract cost and schedule status and the contractor's funding requirements. This information enhances the ability to detect and control cost growth. CCDR reports are used to collect projected and actual cost data on acquisition programs for DoD cost analysis and procurement management purposes.

If the program is designated to report in accordance with DoD Instruction 7000.3, "Selected Acquisition Reports (SAR)," significant NATO program data and accomplishments should be provided in the appropriate formats. Data on Foreign Military Sales (FMS) must be incorporated in Format E, Program Acquisition Costs. See DoD 7000.3-G, "Preparation and Review of Selected Acquisition Reports," for detailed guidance on SAR reporting.

Payment provisions to the MOU and contract must meet the requirements of DAR Appendix E-220.1 on Progress Payments on Contracts for Foreign Performance and E-220.2 on Advance Payments on Contracts for Foreign Performance. For progress payments to be authorized, that progress must be subject to U.S. approval and audit of work in progress and material expenditures.

Public Law 91-379 established the Cost Accounting Standards Board with the authority to promulgate a formal body of cost accounting standards for "covered" defense contracts. Most large acquisitions are covered by the requirements and standards of the cost accounting standards. A waiver has already been granted to any contract or subcontract over $100,000 awarded to a foreign government, agency or contractor pertaining to the requirements of Cost Accounting Standard 403 or any subsequent standards. This exception does

[3] DoD Directive 5530.3, "International Agreements," 3 Nov 76.

not relieve foreign concerns of any obligation to comply with Cost Accounting Standards 401 and 402, and to submit a disclosure statement. A special exemption has been granted for the NATO PHM Ship and to UK contractors for performance substantially in the UK, provided that the UK contractor has filed a completed disclosure statement with the Ministry of Defense.

TRUST FUND MANAGEMENT AND FINANCIAL MANAGEMENT--SELLING

A trust fund is an account established by financial credits or direct payment accepted in a fiduciary capacity by the United States Government to finance the development or purchase of specific systems and spares or to provide services such as logistics support, training support, configuration management, testing, engineering services, et al. Trust funds are established and maintained separately for each purchaser country and international organization with fund visibility at the sub-case or line-item level of detail. The trust fund from each country/international organization is maintained as a corpus, but the accounting status is controlled on individual cases. The Security Assistance Accounting Center (SAAC), Lowry AFB, CO 80279, is the DoD agent for accepting deposits and issuing obligation and expenditure authority to the DoD component. DoD Instruction 2140.1 requires that new procurement actions for foreign customers be accomplished to the maximum extent feasible and appropriate through the direct citation method. The trust fund accounting data are directly cited on the DoD contract, thus they are the funding source for the U.S. Government paying office. The reimbursment method citing appropriated funds to be reimbursed subsequently by SAAC or by other organizations having reimbursable authority has also been utilized in the past, but is no longer to be utilized if direct cite is appropriate. See the bottom portion of Figure 10-1 on this flow of funds authority.

Financial control in a multinational program office has the same basic purposes as in any program office. An integrated accounting and financial control system is a necessity in order to have the required protection for the customer governments and to assure that sufficient funds are available in the trust fund to meet case level obligational requirements. Financing requirements are phased to ensure that only current fiscal year requirements are requested and that overobligations/overexpenditures are not experienced. Complications, such as having the proper mix of currencies to pay contractors and subcontractors, can make this a complex financial control system, however.

To facilitate budgeting, financial planning and cost estimates, a pricing data base must be generated to reflect present and anticipated costs and cost estimating relationships. This data base is not solely for the cost and program analysts, comptroller and accountants, but includes such data as engineering estimates, logistics support loadings, testing costs, training estimates, transportation factors, etc. Critical to the accomplishment of pricing is the identification of every applicable pricing element to be applied at the case line item level in the estimating of the costs of defense equipment and services. This data base is developed and maintained in the program office. An interactive data base is maintained at SAAC linking the DoD component and SAAC, such as the Army Customer Order Control System (ACOCS) for tracking case commitment/obligation authority by direct cite and reimbursable methods. The other Services have similar interactive links with SAAC. Two forms, DoD Form 2060 (FMS Obligational Authority) and DD Form 2061 (FMS Planning Directive) are the prescribed formats for the interactive data

base with SAAC. DoD Form 2060 is prepared by the DoD component to request obligational authority from the SAAC. DD Form 2061 details the pricing elements and status of obligational authority requested and received for the current year and required for the budget year.

In accordance with DoD Instruction 2140.3, payment schedules and requests for payment amounts should be scrutinized for accuracy. Payments must be sufficient to cover all costs and provide for contingencies such as termination liability. Progress payments provide for incremental payment of material, services, administrative changes, contractor holdback and any other applicable contingencies or increased efforts. For cases with a value of $7 million or more and proposed amendments, financial analysis is required to accompany the Letter of Offer to permit all approval echelons a review for completeness and accuracy of the financial data utilized for the estimate. A termination liability worksheet is to be included as part of this financial analysis.

OTHER FORMS OF FINANCING

Pursuant to a determination by the Director, DSAA, a DoD component may offer terms of payment on time of delivery, loan agreements, credit financing or other special terms. Under the terms of payment on delivery, the USG issues bills to the purchaser at the time of delivery of equipment and services from DoD resources. Sections 23 and 24 of the Arms Export Control Act provides for the extension of DoD guaranteed loans with FMS loan funds. DSAA arranges the DoD guaranteed loans with the Federal Financing Bank. The customer country enters into the loan agreement with the Federal Financing Bank with repayment made back to this Bank. DSAA maintains 10% of the value of each loan authorized as a guarantee of repayment, this amount being reduced as the loan is repaid. Another DoD direct credit program rapidly being phased out with only one country eligible in FY80 uses appropriated funds. In this case the credit agreement is between the borrowing country and DSAA. Customers may also utilize credit from commercial banks and lending institutions; however, this is the same as "cash" as these loans are not guaranteed by the USG/DoD. Letters of credit and other commercial paper fall into this area of "cash" sales.

On special arrangements and/or for several countries with prearranged unique payment arrangements, special financial terms are applicable. Israel is allowed by Section 31 of the Arms Export Control Act not less than $1 billion of the total DoD credit/loan program with a ten-year grace period on repayment of principal, with repayment completed not less than 20 years after the grace period, and release from one-half of its liability. Turkey, Greece, and Sudan are authorized by the International Security Assistance Act of 1979 to specified guaranteed credit amounts under the same conditions of repayment except that none of the loan is forgiven.

The State Department role under Section 2 of the Arms Export Control Act is to make determinations as to the countries to receive credit/loan amounts except where Congress has legislated amounts, ceilings, or prohibitions. DSAA administers the DoD Direct Credit and Guaranteed Loan programs. The Federal Financing Bank is an instrumentality of the USG under the supervision of the Secretary of the Treasury, with generally less than 10 percent of its volume based upon the FMS and commercial export loans.

Normally, credit/loans are to be used for procurement of equipment. The State Department has occasionally approved credit/loans for follow-on support and spares, but normally such resources should be bought with "cash". Loans are also not to be used to pay off past loans coming due or, in exceptional cases, to purchase foreign products or services where greater than 49 percent of the product is of foreign origin. Both DoD Direct and DoD Guaranteed loans can be used to finance commercial export sales directly from a U.S. supplier.

RECOUPMENT OF NONRECURRING COSTS

DoD Directive 2140.2 "Recoupment of Nonrecurring Costs on Sales of USG Products and Technology" establishes criteria within DoD and by U.S. defense contractors when selling products and technology developed with DoD appropriations to a foreign government, international organization, foreign commercial firm, or other non-U.S. Government customers. Although costs to be assessed are normally determined by the fly-away cost of the end item, recoupment will be made both on the end item and component sales if the components meet the thresholds as established in DoDD 2140.2. These thresholds are:

- Nonrecurring RDT&E costs of $5 million or more,
- Nonrecurring production cost of $5 million or more, or
- Nonrecurring FMS costs of $5 million or more.

Where a direct sale is anticipated, the appropriate Defense Acquisition Regulation (DAR) Sections 4-109 and 7-104.64 clauses should be included in the contracts between the DoD and the contractor. A deviation to DoDD 2140.2 can be requested for a U.S. Government sale or a direct sale by the Service, foreign government or Defense contractor, and may also be waived in the MOU.

The Director, Defense Security Assistance Agency (DSAA) must approve proposed pro rata recoupment charges for major defense equipment. Approved pro rata charges established since 5 January 1977 may be used without prior approval, provided the items are on the Major Defense Equipment List (MDEL) maintained by DSAA or approved for MOU negotiations. Approval of pro rata recoupment charges will be requested by DSAA only for those items: (a) which are on the latest edition of the Major Defense Equipment List (MDEL); and (b) for which a current negotiation, request for letter of offer and acceptance (LOA), or commercial demand exists.

Other countries also attempt to recoup expenditures for the research and development of major military equipment. One means of recoupment is through the direct sale of a technical data package and licensed production rights. A more common method of recoupment is the charge by the government which paid for the development of the equipment, on all sales made by its contractors. Charges are levied against both domestic and foreign customers, and are applied to the manufacture and sale of the end item, sale of technical data, and licensing of others to produce the item. This indirect method of recoupment through the contractor may be circumvented by direct negotiations between governments. Under this arrangement, the levy is paid directly to the developing government. The amount of the levy is usually determined by a pro rata determination of the common costs, based on the number to be bought or

produced by one party, as a percent of the expected total number of items to be produced by all parties.[4]

The United Kingdom, the Federal Republic of Germany, France, Italy, Belgium, Netherlands, Norway, and Canada have recoupment policies. The Federal Republic of Germany seeks to recover not only contract costs but also interest on its investment. Germany requires its contractors to reimburse the government for developmental contract costs paid for by the government, plus a 6½ percent surcharge for a license or production for delivery to a third party. Under this German procedure, the contractor pays either 5 percent of the unit sales price or 50 percent of the net license fee. The amount of reimbursement is based upon the original development contract and does not include test samples and special tooling delivered to the government nor other costs incurred by the German government, such as field tests. The reimbursement obligation expires at set periods after the signing of the final developmental report. Periods of recoupment have been set by the value of the contracts: contracts up to DM 10,000 normally have a recoupment period of less than five years; contracts up to DM 50,000 have a five-to-ten year recoupment period; and major development programs have a recoupment period of at least ten years. It is the responsibility of the contractor to make automatic payments and report his sales. Often if the contractor can show that he is unable to compete for a sale because of the reimbursement costs, the German government will allow a reduction in the terms. Whenever the development is based upon more than one research and development contract, a common end date is established for the recoupment on the original and all succeeding contracts, even if the contracts are scheduled to expire at different dates.

The French government normally limits recoupment to 80 percent of the contract costs regardless of French proportion of total sales. France has its contractors pay certain fees in accordance with Article 89 of the General Administrative Provisions of Industrial Contracts (Title VI), approved in Decree No. 67-999, dated 3 November 1967. This Decree states that, "unless otherwise specifically provided by the contract, fees are paid by the contract holder to the government for the sale and for the granting of the right of reproduction, in France and abroad, of materials, elements or parts resulting from the studies conducted under the contract." The fee for sales is 2 percent of sale price, exclusive of taxes. The fee for another contractor to produce items is 30 percent of either the licensing fee or of the cost of materials produced, unless the original development contract called for a different rate. The French contractor pays the recoupment fees. Reduction or elimination of this fee can be granted by the French Government upon presentation of adequate justification.

Under the United Kingdom's Form 6/15A, special contract clauses relating to industrial property rights, the U.K. contractor must reach agreement with the Government for the sale or licensing of equipment developed at Government expense. Because of the problems of forecasting total sales, normally a fixed percentage of the sales price (7½ percent being the most widely used) or licensing fee (33-1/3 percent also common) is levied where the government has

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[4] Recoupment of Research and Development Costs in NATO Countries, North Atlantic Treaty Organization Working Group on Industrial Property -AC/94, Brussels, 1974.

paid all of the development costs. The portion of the total development cost borne by the United Kingdom particularly affects the percentage.

The policy relating to recoupment is flexible in Canada, consideration being made on a case-by-case basis. Italy also has a very flexible recoupment policy. The present method is to levy a 5 percent tax, without limitation to the amount recouped. The recoupment levy relative to the Netherlands is based upon total number of items estimated to be produced. The seller pays the share of the Netherlands Government developmental cost per item. Should the Netherlands recoup all of the development costs, royalties may be charged on a case-by-case basis.

The Government of Belgium provides interest-free loans for up to 80 percent of the cost for research and development of equipment and manufacturing processes repayable when the product or process becomes profitable. The purpose of the loans is to provide employment in Belgium. A levy is applied to operating profits and is limited to the total loan. The Belgian Minister of Economic Affairs is the Government official empowered to grant these loans on behalf of international organizations of which Belgium is a member. For international programs, special arrangments for the recoupment of research and development costs are covered by Belgian law which requires repayment of the loans and also a levy on the profit from sale or licensing of the production of the product; however, the levy cannot be in excess of the loan received.

Norwegian armed forces procurement regulations provide, as a general principle, the recoupment of costs associated with the research, development and production of new military equipment. Proprietary rights for equipment with both commercial and military purposes remain with the commercial entity, whereas proprietary rights for new equipment solely for military purposes reverts to the Government. Production rights for solely military equipment for export sales are subject to the payment of a license or royalty to the Government. Very stringent regulations restrict all export sales from Norway, however. Royalties over the past ten years have averaged approximately 5 percent. When a Norwegian company is competing with foreign firms, a request for waiver for a portion or all of the royalty is frequently given. Exclusive licenses to one Norwegian firm are an exception to the rule; normally the Norwegian government prefers to grant only non-exclusive licenses.

Denmark, Greece and Luxembourg have no special provisions for recoupment of research and development costs.

In most cases regarding recoupment of costs in NATO cooperative research, development and production programs, uses of levies or royalty payments are restricted to non-participating countries. Such levies on NATO programs should normally be in the same proportion as each country's contribution to the cooperative effort. Levies are normally waived for all participating governments. All countries appear to have a very flexible attitude as to the amount of levies and the extent of recoupment. Recoupments are normally not appropriate for data exchange or basic research programs. It also must be emphasized that industrial recoupment of research and development costs, especially by European firms, may be a significant factor as intellectual property rights accrue to the inventor and industrial firms under most European laws (see Chapter 8 on Intellectual Property).

PRICING AND ASSET CHARGES

DoD Instruction 2140.1 contains the policies that provide for uniform application of pricing and cost criteria to FMS agreements, supply support arrangements, direct sales, coproduction, and codevelopment in order to recoup DoD costs, which cover investment costs and an administrative charge for use of the DoD system. Pricing is normally provided on a DD Form 1513. A properly executed DD Form 1513 represents contract authority to the trust fund. The program manager and his contracting officer must obtain obligational and expenditure authority from the trust fund. Cash disbursements are controlled on a country basis, although transactions must be on a case basis and the individual status of cases must be maintained as discussed previously in the chapter. Where interest is charged, it will be at a rate determined by the Secretary of Treasury based upon current short-term average market yields. The Security Assistance Accounting Center (SAAC) is responsible for interest calculations and billing, unless other arrangements have been made in the MOU.

A charge for the use of DoD facilities and equipment, called an asset use charge, is also to be included in the pricing and billings. The asset use charge is applied as a percentage of the direct costs, rather than depreciation, damage or interest on investment. Percentages are 1 percent for items from DoD inventories and 4 percent of the direct cost where DoD facilities are used.

The general attitude on waiver of government controlled charges is that while in principle the NATO governments are willing to do so reciprocally, they are unwilling to apply any blanket policy other than to review the possibilities on a case-by-case basis. More information is contained in AC/94-D/291, December 22, 1980, prepared by the NATO Group on Intellectual Property and International Co-operative Arrangements.

When evaluating purchases from European suppliers, the program manager and prime contractor(s) must understand the various differences in foreign pricing which usually are not encountered when dealing with U.S. contractors. These differences can affect the evaluation whenever competition exists so that comparisons may have to be made on a "total cost" basis. In a sole-source situation, evaluation of the differences in pricing is necessary prior to negotiation because many of the special costs affecting prices can be minimized by establishing special provisions in the weapons specific memorandum of understanding (MOU).

One problem in analyzing foreign prices is the reluctance of most European firms to provide a detailed cost breakdown. The European concept of a fair and reasonable price is tied directly to the marketplace, however imperfect it may be. "Whatever the market will bear" is often the sole basis for a European firm's pricing policy. Thus, the U.S. negotiator must perform an independent price analysis based on domestic budgetary estimates. The most effective tactic in dealing with this situation is to generate competition and not worry about the cost breakdown at all. In mandatory sole source situations such as directed purchases to specific sources, the best approach seems to be an appeal for a price reduction based on the purchaser's budgetary limitations (both real and imagined).

Another problem is that certain types of cost are often partially hidden, involving special handling, storage, taxes, and transportation. Even in a purchase which specifies FOB Destination, some of these costs still must be considered. For example, the movement of the material should be monitored to ensure eventual receipt. This involves additional transportation specialists and expediters who must make long distance telephone calls or take trips for the major purchases. Since most European firms operate on an "ex works" or "ex dock" (FOB Origin) basis, these handling charges, taxes, and various permit fees become a direct cost for the purchaser. In fact, there are many European trading terms such as "FAS (Free Alongside Ship) Vessel" and C.I.F. (Cost, Insurance, Freight) Destination" which are not commonly used in the United States. These terms are clearly defined in a publication called INCOTERMS, which is available from the National Committee of the International Commerce Commission located in New York City.

A third problem is that currency exchange arrangements can greatly affect the final cost. Although discussed in more detail later in this chapter, currency exchange agreements within the memorandum of understanding should address (1) which currency is to be used for pricing the contract, or, alternately, the fixed exchange rate; (2) the timing of currency exchanges; and (3) the basis for conversion rate determination, and the extent of risk sharing for currency fluctuation. Historically, the buyer could generally insist on his own currency for contract pricing. With the fluctuation of the U.S. dollar relative to most European currencies, many European suppliers demand exchange rate guarantees. In effect, the contract is priced out in the supplier's currency. The buyer must establish a currency fund pool normally obtained by buying futures in the supplier's currency (not allowed by U.S. Treasury regulations for U.S. agencies) or risk an automatic price change when the foreign currency rate fluctuates. A skillful negotiator may be able to shift a part of the risk of exchange rate fluctuations to the supplier by a sharing formula on currency losses, or simply limiting the amount of loss the buyer will withstand with the supplier picking up the losses over this amount.

Unfortunately, foreign exchange pricing arrangements are often further complicated by the timing of payment. European firms tend to have cash flow problems and must frequently assign contract payments to lending institutions. Advance payments obviate the need to make these assignments and are, therefore, very desirable to the seller. In fact, many European suppliers will make significant price concessions if advanced payments are to be made. If the exchange rate and timing of payment factors are carefully tied together, the result can be the elimination of exchange rate fluctuation problems and a price reduction in consideration for the advance payments.

CURRENCY MANAGEMENT

The objective of this section is to document current policies, agreements and procedures related to exchange of foreign currencies. The methods used for currency exchange in the F-16, airborne portion (E-3A) of the NATO Early Warning and Control Program and the NATO Sea Sparrow System programs were evaluated to help develop better approaches to this problem area. Currency conversions are normally required if the offset commitment is a significant portion of the program.

The NATO Sea Sparrow Surface Missile (NSSMS) is produced by and for a number of NATO nations including the USA, Norway, Belgium, Denmark, Italy, Germany and the Netherlands. The Canadian government has also developed its own Canadian Sea Sparrow Missile System. The prime contractor is Raytheon Company which was also responsible for engineering development of the system. Raytheon has subcontracts with nine companies in each of the consortium countries except Germany. These subcontracts allow the countries to offset their acquisition costs by the value of the production in their own countries. Almost all of the offsets are accomplished in the first tier subcontracting with second tier and below subcontracting in other countries than the first tier being insignificant.

Raytheon is responsible for 1) paying its European subcontractors in their own currency, and 2) ascertaining the currency fluctuation effects for the second tier subcontracts. A quarterly price adjustment to the prime contract is made to cover the currency fluctuations. The contract price is based upon 1 May 1973 exchange rates. Any price adjustments made because of currency fluctuations experienced at the first and second tier subcontractor level may change the target cost and ceiling price, but not the profit, provided for in the Raytheon contract. Raytheon actually procures the proper foreign currency as it is needed to make subcontractor progress and final payments. Because Raytheon has many other foreign contracts, a separate corporate office is maintained to take care of currency requirements for all of its foreign contracts. Purchases of currency are made based upon subcontractor performance or delivery dates. Raytheon as well as the subcontractors maintain complete records on all transactions on the subcontract, including dollar payment and exchange rate obtained, date paid and the difference from the fixed rate. The quarterly adjustment is subject to audit by DCAA.

The NSSMS foreign currency payment system is relatively simple and it is apparently successful. The relatively minor second tier currency exchanges makes the accounting relatively simple.

The NATO E-3A is to be delivered to NATO, rather than individual countries. A NATO Airborne Early Warning and Control Program Management Organization (NAPMO) was established in December 1978 by NATO through the North Atlantic Council. An agreement was signed by the NAPMO and the USG on 11 May 1979 for acquisition of E-3As and USAF program management services. Industrial collaboration is involved in approximately 20 aircraft component packages, under which the U.S. contractors, Boeing and Pratt Whitney will subcontract with Canadian and German firms for the component packages. The MOU states the following financial conditions:

(a) Neither prime nor subcontractors will realize financial loss or gain through fluctuations in currency exchange rates.

(b) Participating governments agree to initial schedules of payments which reflect each government's established percentage share of the cost of the program in constant currencies and which are phased to meet both national budgetary constraints and phasing of total funding requirements.

(c) The NAPMO is authorized to open commercial accounts in its own name in any or all of the currencies used and in any or all of the countries of participating governments.

(d) In order to insure adequate program funding, the NAPMO will arrange for financial plans to be produced and updated at least annually. These plans will identify all anticipated quarterly expenditures for the remainder of the program in all currencies required.

(e) The USG as Agent will have complete responsibility for effecting payments to the prime contractors from funds made available by the NAPMO, and will have sole authority to approve such payments.

(f) Contracts down to the third level will be concluded and paid in the currencies needed, which will be provided by NAPMO.

A fixed rate of exchange is used expressed in U.S. dollars. NAPMO provides all the foreign currencies required by Boeing to pay its European subcontractors while the paying office at Hanscom AFB, MA, provides the dollars to non-U.S. subcontractors to pay their U.S. subcontractors. The contractor is responsible for forecasting non-U.S. currency requirements, using the Contract Funds Status Report (CFSR) submitted quarterly as the forecasting instrument. When currencies are received by the contractor, prompt payment is required. Non-U.S. currencies used in prior periods are also reported by the contractor. Upon receipt of a contractor request for currency, the U.S. Administrative Contracting Officer (ACO) reviews the request for allowability and certifies the non-U.S. funds requirement by notifying NAPMO to make the non-U.S. currency available to the contractor. In the case of U.S. currency, the ACO forwards a copy of the payment voucher to Hanscom to issue such currency to the European contractor for payment to his U.S. second tier or below subcontractors.

The F-16 example is complex because of the ground rules, number of contractors and subcontractors in each country and because of the relatively large requirements for foreign currencies. Technical Agreement No. 4 to the basic MOU specifies that payment schedules be developed using the following general principles:

- A time-phased schedule of required quantities of each country's currency necessary for the program will be prepared by the U.S. prime contractors. This schedule will separately identify currency requirements associated with the production for EPG and non-EPG industrial effort.

- Each of the four EPGs shall pay the following percentage shares (based on a 348 aircraft program) of each of the four EPG currencies needed to support the financial obligations of the EPG portion of the program:

Belgium	33.333%
Denmark	16.667%
Netherlands	29.310%
Norway	20.690%
TOTAL	100.000%

- The USG will provide to the Air Force Accounting and Finance Center (AFAFC) all the necessary EPG currencies to support the European

industry effort associated with the USAF and third country aircraft related effort.

- If any interest accrues on EPG currencies deposited in F-16 AFAFC bank accounts in the four European participating countries, the five countries shall share the interest on the same percentage basis as they provide the currencies.

- If a failure to make payment on time results in one or more EPG currencies being unavailable to finance the EPG portion of the European industry effort, the four EPGs agree that the financial consequences being borne by the country not making the payment will include the difference in the exchange rate between what the USG had to pay to cover the currency shortage and the rates listed in Supplement No. 1 to the MOU.

The USAF Accounting and Finance Center (AFAFC) is responsible for managing foreign currency transactions associated with the F-16 program and is required to maintain sufficient balances of currencies to facilitate currency conversion transactions between the U.S. contractors and the EPG coproducers. Currencies are provided by the EPG to the AFAFC accounts per the payment schedules and by the U.S. as needed for EPG industry efforts associated with the non-EPG (U.S. and third nation sales) portion of the F-16 program. Currency conversions are made at the base rate established in the MOU.

Economic price adjustments are included in the prime contracts. The price indices for the European subcontractors are provided by each EPG country and are reflected in price adjustments to the prime contractors. The economic price adjustments are computed semi-annually for EPG aircraft and are prorated to each EPG payment schedule.

The F-16 EPG aircraft program uses a level-line price approach totaling the aggregate costs for recurring and nonrecurring airframe, engine, radar and GFAE costs for the 348 aircraft for the EPG and dividing this total cost by 348 for a unit cost. Recoupment, minor development support equipment, industrial management and duplicate tooling costs are specifically excluded from level-line funding. The actual cost of the F-16A (single-seat version) and F-16B (two-seat version) are tracked and prorated separately. Each EPG country pays its prorated share of the common level-line costs at each payment interval. Tooling is to be paid by the country in which the tools are located. EPG configuration options are handled as separate cases. For third country sales, the USG is also responsible for recouping the costs of EPG tooling on sales to third countries.

AFAFC Regulation 177-3 states the responsibilities and procedures for the operation of the accounting and finance clearing house for the F-16 program as a field extension of the AFAFC. A Currency Clearing House (CCH) is collocated in Brussels, Belgium, with Air Force Contract Administration Services--Europe (CASEUR). The CASEUR provides overall contract management in Europe for the F-16 program. The CCH is the accounting and reporting center for F-16 currency exchanges, reporting currency exchanges to SAAC and AFAFC.

A time-phased payment schedule is prepared by the U.S. prime contractors separately identifying the currency requirements of both the EPG and U.S.

production. The actual amount required is billed on the DD Form 645 developed by the F-16 SPO and approved by SAAC.

The Central Bank for all European currency transactions is also collocated in Brussels with the CCH and CASEUR. A Bank arrangement has been established to provide for a F-16 Central Bank with Limited Depository Accounts (LDAs). The supply of currencies required for the contractors' and subcontractors' payments is collected from the EPG countries and the USG by deposits in the LDAs. If additional currencies are required beyond the payment schedules, the U.S. Disbursing Office--Paris makes open market purchases of currencies for the CCH at the prevailing foreign exchange rates that may represent financial losses or gains for the USG and EPG. The banking operation consists of accepting and recording currencies from the five participants and transferring currency to the contractors' and subcontractors' accounts. The Chase Manhattan Bank is the financial institution operating the Central Bank and the four LDAs of the EPGs. The banking arrangement is centrally managed by the Chase Manhattan Bank in Brussels, which reports all deposits, disbursements, withdrawals, operating expenses and interest by the transaction date, country, currency and amount, and applicable interest rates. The U.S. Air Force programs and budgets for the possibility of currency exchange losses to be absorbed by the USG in the USAF procurement appropriation.

The CCH is the key to currency flow. Three (3) billion dollars to $4.5 billion of contract work must be placed with EPG firms and funded with EPG currencies. Because of the magnitude of currency requirements, a number of legal and institutional restraints have been established:

- Demand - The acquisition of each currency to meet U.S. commitments is limited to the amount projected to be required in the next ninety days for payment to the EPG firms. Projections are provided to the F-16 SPO by the prime contractors (General Dynamics and Pratt and Whitney). The SPO reviews and adjusts the projected requirements to assure reasonableness. The purpose of this limitation is twofold. First, it precludes the buildup of excess foreign currency in countries at the expense of debt financing by the U.S. Treasury. Second, it limits the ability to speculate in or take advantage of unusually favorable exchange rate situations relative to other participants' currencies.

- Currency supply - Currency supplies are limited to 90-day requirements as opposed to the total percentage called for as a result of the coproduction agreements. This limitation recognizes that the coproduction requirements are not linear with time. Specifically, the Belgium efforts are front-end loaded because of the capital requirements to buy new tooling whereas Danish efforts tend to be more straight line. Thus at any point in time the requirement for each currency can vary significantly from the percentage over the life of the program. This limitation also helps preclude speculation.

- Transmutation of currency - U.S. supplied foreign currencies cannot be obtained through the exchange of any EPG currency for another, i.e., the U.S. cannot take advantage of an unusually favorable EPG to EPG exchange rates to reduce its losses. However, interest accrued on U.S. LDA deposits for each currency may be used to reduce the costs of exchange transactions.

- Interest - The dollar value of interest accrued on U.S. foreign currency deposits is credited to the Treasury and is not available to the SPO to finance F-16 program costs. However, the foreign currency resulting from this interest may be used to reduce the purchase requirement, thus mitigating exchange losses.

- Currency exchange reconcilation - Gains and losses resulting from actual currency exchange transactions as opposed to the January 1975 fixed rate are reconciled annually and charged to a special F-16 appropriation to cover gains and losses.

Whatever currency conversion method is chosen, the actual amount and mix of currencies in the right place in a timely manner is critical for effective program execution. The magnitude of currency requirements and the possible impact on the international currency markets must be taken into account. Adequate limitations and constraints must be established to assure protection of the various participants.[5]

Increased complexity in currency exchanges by more than one prime, and second and lower subcontractor exchanges drive the selection of the system, the NSSMS system becoming administratively expensive, and making separate auditing overly complex. Central administration and control is most desirable, whether accomplished by the contractor or the government. Any financial management system including currency exchanges must observe the following general principles in negotiating with foreign governments and international organizations:

- The U.S. Government will not permit the withdrawal of dollars from the Treasury, for placement with any program management organization, prior to the need for the dollars as determined by the actual immediate funding requirements of the recipient organization to carry out the project.

- Arrangements which require U.S. funding shall be negotiated to provide for dollar outlays as close as possible to the time of need for current program expenditures.

- Each program should be structured, to the maximum practical extent, so as to provide the flexibility required for each participating nation to fund the program in a manner consistent with its own fiscal needs and policy considerations.

- The U.S. Government's share of funding required to support a program shall be obtained by appropriation and no part of such funding shall be derived from interest earnings on U.S. contributions.

- Each request from a foreign nation for the temporary deposit and safekeeping of dollars in trust in an account in the Treasury will be decided on its own merits, based on the reasons therefore, the specific financial arrangments proposed, and the relevant U.S. Government political and general financial considerations.

[5]DoD Directive 5100.29, "Use of United States-Owned Foreign Currencies for Payment of Contracts in Foreign Countries, 9 Feb 68.

- Unless otherwise required by law, the U.S. Government will not invest funds on behalf of a foreign nation when U.S. Government receipt of such funds would serve as the basis for creating contract obligational authority for a U.S. Government department or agency.

- Application of these general principles in negotiations with foreign nations shall not be compromised by administrative practices of U.S. Government departments or agencies. Existing practices should be altered or revised to achieve the principles of the funding policy.

- All exchange of dollars for foreign currencies is to be conducted for "spot" delivery. No use may be made of forward contracts, or of purchase at negotiated rates directly from foreign governments or private contractors.

- No U.S. dollars shall be exchanged for foreign currencies prior to the time at which the foreign currency is needed for immediate funding requirements.

- U.S. Government agencies must avoid any appearance of currency speculation.

- Any change in program costs resulting from the foreign-currency denomination of international financial arrangments is the responsibility of the program agencies, U.S. or foreign, involved.

- United States Government agencies wishing to reduce exchange risks for the United States in international programs should take steps for a larger portion of the program expenditure to be in the United States, or for more dollar denomination of the financial arrangements, or for use in such financial arrangements of a multiple currency "unit of account" which includes the dollar as one of the currencies.

- Use of a multiple currency unit of account which includes the dollar, such as the SDR, may be considered in consultation with the Treasury, if the alternative is denomination in a foreign currency. Dollar denomination remains the preferred option in terms of minimizing exchange risk. In comparison with use of a single foreign currency, use of a unit of account tends to reduce the exchange risk for the United States by sharing it, while dollar denomination eliminates the risk entirely.[6]

AUDIT BY DEPARTMENT OF DEFENSE

General

The advent of coproduction and offset arrangements has resulted in placement of numerous contracts and subcontracts in NATO countries. This has

[6] ASD(C) Memo, Subj: Department of Treasury Policy for Financial Transactions with Foreign Nations and International Organizations, dated 31 Jan 80.

led to discussions of audit of NATO contractors by DCAA as well as their compliance with U.S. cost determination principles in the form of the Defense Acquisition Regulation (DAR, Section XV).

It is preferred that audit of U.S. prime contracts or subcontracts awarded to foreign concerns be performed by the Defense Contract Audit Agency as authorized by DoD Directive 5105.36, 8 June 1978. This entails audit according to DAR, Section XV, in accordance with standard contract terms. Minor variations from U.S. cost principles can be accommodated in auditing, but it is not feasible in view of training and management considerations to contemplate DCAA auditing according to other regulations which the foreign concerns or governments may want to follow.

Foreign concerns and governments often prefer to utilize their own auditors and cost determination regulations by negotiating special arrangements. Such special arrangements are negotiated on a Government-to-Government basis either at the start of a specific program or they may apply to all business performed for DoD in certain NATO countries. The military service program manager should inquire into the existence of such arrangements whenever audits will be required in a NATO country.

Agreement to any special requirements to depart from standard audit roles or cost principles calls for participation in the negotiation of an audit annex by OUSDRE, International Acquisitions, and Assistant Director for Operations, DCAA. Early coordination with DCAA is essential to avoid operating problems that may be associated with envisioned audit roles of cooperating governments. Early coordination with International Acquisitions may similarly smooth out the process of obtaining cost principle deviations when appropriate.

It is also important to coordinate with DCAA Headquarters as soon as overseas audit requirements become known, even if no deviation from U.S. cost principles or audit roles is involved. This is particularly appropriate where auditable overseas procurement is expected to exceed $100 million, or if there are other unique features to the procurement. This facilitates DCAA planning and staffing of overseas activities. DCAA is available for consultation regarding utilization of foreign audit organizations when special audit arrangements are being considered.

Special Audit Annexes

Special audit annexes to Memoranda of Understanding (MOUs) covering other aspects of international relations have generally provided for NATO countries performing independent audits according to terms of the contract. The contracts generally specify standard cost determination principles, and other U.S. regulations, but the wording of the audit annexes is flexible enough to allow accommodation of special considerations through standard DAR deviation procedures. However, DAR, Section XV, contains provisions on three items that are based upon public law and are not subject to deviation. They are the provisions on advertising, Independent Research and Development/Bid and Proposal, and agents' fees.

These special audit annexes usually provide for reciprocal provision [illegible] by DCAA in the United States. All DCAA audits should be under

conditions where U.S. cost determination principles are applicable, because it is not practical to manage and train auditors in the varying regulations of all NATO countries. Some countries may not have extensive procurement regulations, and there can be numerous unwritten practices to consider.

Audit annexes also provide for direct contact between contracting officers and foreign audit organizations. The final decision on adequacy of information in support of negotiations should be reserved for the contracting officer. The annexes also provide that under extraordinary circumstances, where a government is unable to perform an audit or to perform it in a reasonable time, the procuring country's agencies have the right to perform the audit.

Arrangements for another country to perform audits for DoD should only be entered into where the country is known to have the resources and technical capability to perform independent audits without supervision or assistance by DCAA. Experience has shown that dual audit participation is neither effective nor timely.

The acquiring contracting officer must make his needs known directly to the performing auditors the same as in the United States in order to get an audit responsive to acquisition needs. DCAA Headquarters as well as field personnel located in Europe are available in a liaison capacity when contracting officers' attempts to secure adequate audit support may be unsuccessful. The audit annex and contract clause must, however, provide for U.S. audit rights including direct access to contractor records in these situations. This form of DCAA involvement may assist the contracting officer in making the decision concerning whether DCAA should perform the audit independently under "exceptional circumstances" provisions of the audit annex. OUSDRE, International Acquisitions, has a project under study to establish an "MOU Negotiation Issue Guide" which is likely to contain DoD policy on cost determination principles and other aspects of international acquisitions.

Payment for DCAA Services

The Arms Export Control Act revision of 1976 requires advance reimbursement for acquisition effort relating to foreign sales of Defense articles and services. Implementing DoD Instruction 2140.1, Paragraph VIIE establishes a surcharge to recover contract administration services costs incurred on FMS new procurements. Conceptually, a contract administration surcharge will be computed on each FMS case as a function of contract costs. The surcharge for FY 1981 is 1.5 percent. Public Law 96-92, International Security Assistance Act of 1979, includes provision for the President to waive charges for quality assurance, inspection and contract audit services under NATO infrastructure agreements where these countries agree to provide such services on a reciprocal basis. This is limited to situations where participating governments provide such services on reciprocal nonreimbursable basis. The necessary DoD approvals will be administratively implemented through OUSDRE.

Audit annexes have remained silent on payment because of the changing environment. There have been verbal understandings that we must comply with our laws as they may be eventually amended and implemented.

It is necessary to estimate the cost of DCAA audit services for inclusion as a direct item in FMS cases when the resulting contracts are likely to require any type of DCAA audit. This may be estimated by application of the following percentages to acquisition values included in FMS cases as follows:

Acquisition Value	Estimating Percentage
Under $1 million	2.0%
$1 to $10 million	0.8
$10 to $100 million	0.5
Over $100 million	0.3

DCAA Headquarters, Budget and Manpower Branch, CFB, should be contacted for more precise estimates on major programs over $100 million if acquisition under the FMS case is to have a long span of two or more years involving multiple contracts and changes.

GAO Audit Authorization

Finally, standard clauses authorizing audit by General Accounting Office (GAO) should be inserted in contracts when applicable according to current DAR requirements. GAO must work out any special arrangements with their counterparts in participating countries. The GAO is generally not a party to DoD audit annexes.

11. FOREIGN WEAPONS EVALUATION

INTRODUCTION

The intent of this chapter is to provide the program manager and his test manager the basic concepts, references, and procedures envisioned for testing of NATO alternative weapons systems. The knowledge of these concepts is required for the PM to obtain Foreign Weapons Evaluation funds for testing of candidate systems to meet requirements of DoDDs 5000.1 and 2010.6, and the implementing directives, instructions, and service regulations.

The foreign weapons evaluation (FWE) program provides for the technical and/or operational evaluation of friendly foreign nations' weapon systems and technology to determine potential use within the Department of Defense. Candidates are selected for evaluation based upon potential satisfaction of an operational need or correction of deficiency. Evaluations are also run on components and technologies for which there are DoD systems which might benefit from technology unavailable in the United States. The FWE program supports the policy as stated in the Culver-Nunn Amendment and DoD Directive 2010.6, that encourage procurement of equipment which is standardized, or at least interoperable with equipment of other NATO alliance members. In addition, the FWE program provides potential for significant resource savings by avoiding unnecessary duplication in development. For most U.S. defense tactical equipment needs, alternative foreign systems must be evaluated and considered prior to initiation of U.S. development. Through data exchange agreements, information exchange groups, and exchange visits, increased interest has been generated within the U.S. military services and in friendly foreign nations in greater standardization through joint use of like weapons. The number of requests for evaluation of foreign weapons systems has increased.

Whenever an item of interest is identified, a data exchange agreement (DEA) between the Service and the foreign nation producing and using or desiring the equipment provides a vehicle for free exchange of information on capabilities, cost, performance, and support requirements. The DEA, if properly structured, allows for exchange of test and operational data. If sufficient data are available from foreign test sources or from various other operational modes, U.S. need for testing and evaluation may be significantly reduced. These DEAs may include provisions for classified data exchanges (See DoD Directives 5230.11 and 5530.3, DoD Instructions 2050.1 and 5230.17, and applicable Service regulations on the data exchange agreement requirements, including classified material exchanges.). DoD Directive 2010.6 requires that, to the maximum extent possible, test data developed by other NATO countries will be used in the evaluation, and the Service will consider tailoring U.S. specifications which preclude U.S. adoption of an otherwise cost-effective allied system or allied adoption of a U.S. system.

Interoperability with NATO equipment is to be demonstrated during test and evaluation to the maximum extent feasible. Although not a part of the FWE program, it can be expected that for equipment to be used in Europe, this issue must be addressed in the test and evaluation report.

TEST AND EVALUATION MASTER PLAN AND POLICY

A test and evaluation master plan (TEMP) is a required test planning document prepared by the Services. The TEMP relates test objectives to the required system characteristics, as specified in the mission element needs statement (MENS) and subsequent Service requirements documents and program decision memoranda (PDMs). The TEMP specifies critical issues to be tested, including interoperability issues. The TEMP details integration of developmental and operational testing to include testing conducted or to be conducted by NATO allied test centers, and acceptance of other test data generated from commercial use and other testing (joint and multi-Service testing, military exercises such as REFORGER, FWE, etc.). The evaluation objectives, organizational responsibilities and resources, and test schedules are provided. The initial TEMP is prepared prior to Milestone I and updated before subsequent decision milestones for DSARC-level systems. The TEMP is provided to Director, Defense Test and Evaluation, for review prior to each milestone review, with a final test report due 3 days before the DSARC meeting.

Test and evaluation is to begin early in the acquisition life cycle to assess and reduce risks and estimate system operational effectiveness and suitability. The test objectives and criteria must be directly related to mission need and minimize subjective judgments on system performance. Test and evaluation objectives must be properly satisfied prior to advancement to the next acquisition phase, to include a requirement for an independent estimate of operational potential before production.

Development test and evaluation (DT&E) is engineering testing conducted with technical personnel, in a proving-ground environment, accomplished by the development agency. DT&E supports engineering design and the development process by verifying specification compliance; addresses both performance and suitability; and examines components, subsystems, hardware/software integration, prototypes, full-scale development models, and compatibility/interoperability with other equipment.

Operational test and evaluation (OT&E) is field or fleet testing conducted with typical operator and support personnel, in a realistic environment, accomplished by an agency independent of the developer. The purpose of OT&E is to address total system performance, effectiveness in an operational environment, and suitability using typical personnel. The characteristics and issues in the decision coordinating paper (DCP) include NATO interoperability and testing of foreign system alternatives via FWE.

FUNDING AND MANAGEMENT

The House Armed Services Committee, in reporting on the DoD Authorization Act for FY 1980, recommended that future authorization requests for FWE funds be combined with that of test and evaluation in the Director of Test and Evalution, Defense Appropriation, and be managed by the Office of the Director of Test and Evaluation. To accommodate this congressional guidance, funds for FWE have been deleted from the Service program elements and placed in USDRE program element (PE 65111D) under the direct cognizance of the Director, Defense Test & Evaluation (DDT&E).

Foreign Weapons Evaluation activities are carried out within the potentially benefitting Service. The evaluation of Army material is conducted by the US Army Test and Evaluation Command, Aberdeen Proving Ground, MD, in coordination with the development command or separate laboratory of the US Army Materiel Development and Readiness Command having responsibility for counterpart US materiel. Army commands and agencies representing user, training, and logistics interests are tasked in a support role appropriate to evaluation requirements. For foreign weapons systems having naval applications, evaluations are monitored by the Office of the Assistant Secretary of the Navy (Research, Engineering and Systems), the Office of the Chief of Naval Operations, and Headquarters, U.S. Marine Corps. Work is performed in various Navy laboratories and test centers such as the Naval Weapons Center, China Lake, CA; the Naval Surface Weapons Center, Dahlgren, VA; the Naval Ship Weapons System Engineering Station, Port Hueneme, CA; and the Naval Ordnance Station, Louisville, KY. For Air Force systems, evaluations are under the management of the Air Force Systems Command, Andrews AFB, MD, and carried out by its subsidiary units such as the Air Force Flight Test Center, Edwards AFB, CA; the Air Force Avionics Laboratory, Wright-Patterson AFB, OH; and the Armament Development and Test Center, Eglin AFB, FL. Depending on the specific equipment and the arrangements made for its evaluation, foreign companies or governments may provide test articles, spare parts, and support equipment or services as required.

The normal candidate selection process will occur as follows. The sponsoring component prepares and forwards to DDT&E a foreign weapons evaluation-candidate nomination proposal (FWE-CNP). The CNP should be submitted 1 year prior to the start of the fiscal year to permit its consideration in the PPBS cycle. A complete set of CNPs is submitted by the Service confirming and prioritizing the candidate programs recommended for funding during the coming fiscal year, 3 months prior to the start of that fiscal year. However, to assure retention of the rapid response character of the FWE, the Services are encouraged to submit a CNP whenever a promising candidate is discovered. All CNPs are directed to OUSDRE-DDT&E with copy to USDRE(IP&T). The Points of Contact, as listed in Figure 11-1, are responsible for the submission of the CNPs.

Candidate nominations will be reviewed by DDT&E and IP&T and selections based on the relative potential of individual candidates. The basis for selecting a candidate includes its potential to satisfy an existing or projected operational need, its ability to meet a deficiency in the current inventory or its possible contribution to our technology base in an area where there is no alternate or equivalent U.S. capability.

The decision on preliminary selection of candidates will normally be forwarded to the Services 2 months prior to the start of the fiscal year. Final approval for each program will be given after the Services have provided OUSDRE representatives with an informal briefing on their respective programs. These briefings are normally presented in the month preceding the new fiscal year. When available funding exists, OSD will provide early (pre-fiscal year) approval of foreign weapon candidate proposals with long lead time requirements. Final OSD approval will encompass firm commitment of funds to support the approved evaluation program. Funds once committed by OSD for obligation in a given fiscal year will normally remain committed to a specific candidate

FIGURE 11-1. POINTS OF CONTACT FOR FWE

ORGANIZATION	OFFICE SYMBOL	AUTOVON
OFFICE OF THE SECRETARY OF DEFENSE		
- Director, Defense Test and Evaluation	DDT&E	225-4608
DEPARTMENT OF THE ARMY		
- Operational Test and Evaluation Agency (OTEA)	CSTE-STS	289-2160
- Training and Doctrine Command (TRADOC)	ATCD-YN	680-3491
- Test and Evaluation Command (TECOM)	DRSTE-TO-I	283-3775 -4675
- Materiel Development and Readiness Command (DARCOM)	DRCIRD	284-8367
DEPARTMENT OF THE NAVY		
- Navy Material Command	MAT08D	222-5884 -3127
- Operational Test and Evaluation Force (OPTEVFOR)	COTF-02	690-5061
DEPARTMENT OF THE AIR FORCE		
- Air Force Test and Evaluation Center (AFTEC)	AFTEC/XRX	244-4891
- Air Force Systems Command	AFSC/SDZ	289-2160

evaluation unless the sponsoring DoD component informs OSD of schedule and associated funding profile revisions. Excess funds resulting from canceling or restructuring a previously approved evaluation will be used by OSD to fund new evaluations or accelerate ongoing approved programs. All funds will be transmitted via military interdepartmental purchase requests (MIPR).

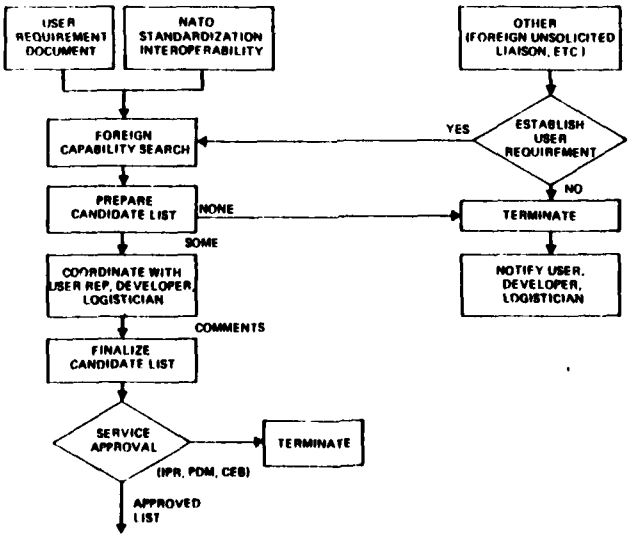
EVALUATION PROCEDURE

A three phased evaluation procedure is normally followed for FWE. The U.S. Army's procedures are detailed in DARCOM-R 70-62 and, although not addressed by USAF and USN regulations, the same or similar procedures are used by the other Services following the intent of OMB A-109 and DoD Directives 5000.1 and 5000.3. AFR 80-14, AF Manual 55-43 (Volumes I&II), and OPNAV Instruction 3960.10A, are to be followed for the USAF and USN, respectively, as with any test & evaluation. Phase I may be managed, depending on the Service,

by the Test and Evaluation Command (USA) or the procurement activity (USN & USAF). Phase II is managed by the Service Test and Evaluation Command while Phase III is directed by the Project/Program Manager. Normally the Service Headquarters and Development Command (DARCOM, NAVMAT, AFSC, or AFLC) have staff coordination responsibilities pertaining to international agreements, RSI initiatives, and other international and related activities. The major subordinate commands, program managers, and laboratories provide assistance in the acquisition of foreign materiel, and are responsible for conducting the Service approval process.

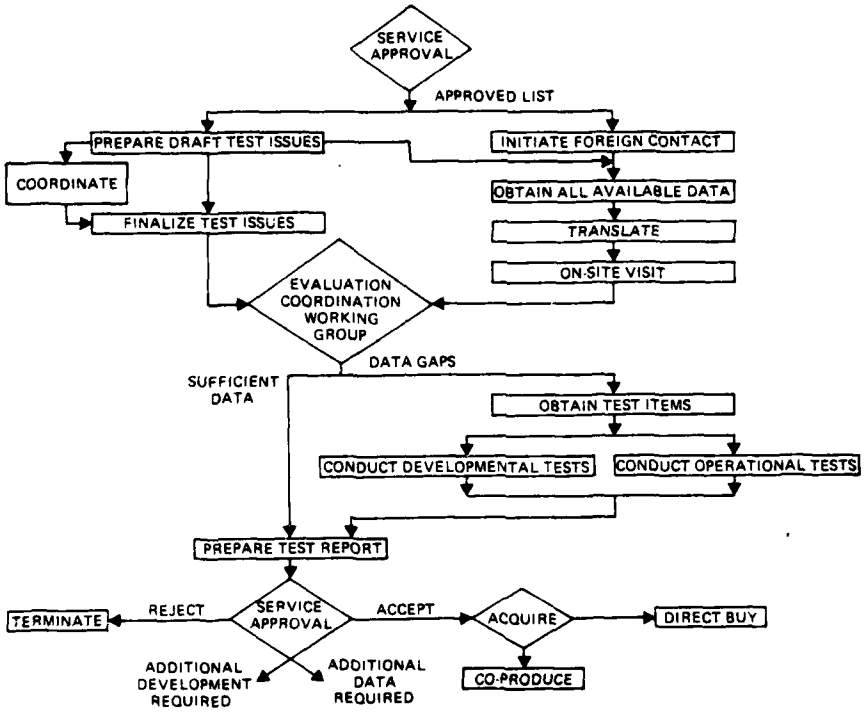
Phase I (Flow Chart, Figure 11-2) consists of the identification of foreign systems which may satisfy a Service requirement. Phase I evaluation is normally initiated by a user requirement document or a NATO standardization agreement (STANAG). Phase I FWE may also be initiated through liaison officers and foreign unsolicited proposals. In the absence of a Service requirement, the effort will be terminated. If there is a requirement but no approved requirement document, a requirement document will have to be prepared and a full capability search conducted to identify other potential candidates. The list of potential candidates may include both foreign and U.S. systems. This list, based upon available information, should contain descriptions of the potential candidates, provide comparisons of performance parameters with the requirements, and provide unit cost and status of the systems. The list is coordinated with the appropriate interested agencies (Service headquarters, developer, user representative, and logisticians) prior to publishing the final list. It is appropriate to present the list to the Service headquarters for final approval in the proceedings of an Army in-process review, Air Force Program Management Directive (PMD) or Navy CNO evaluation board (CEB) decision.

FIGURE 11-2. FWE PHASE I



If the decision at Service headquarters is to approve Phase I and continue into Phase II, the development command becomes the coordinator for the evaluation effort (Flow Chart, Figure 11-3). An evaluation coordination working group (ECWG) is established and chaired by the development coordinator,

FIGURE 11-3. FWE PHASE II



consisting of the user's representative, the logistician, developer, trainer, operational evaluator, and development evaluator. As part of Phase II, foreign governments and/or industries are contacted to apprise them of U.S. interest and to ascertain if the foreign governments and industries are willing to cooperate in the program. The test issues are prepared by the appropriate evaluating agencies and submitted to the ECWG. The test issues are used by developmental and operational testers to identify the data requirements and prepare an evaluation plan. Based upon input and review of previous data, on-site visits to the foreign evaluation center may be required. FWE funds finance the TDY. The data search results are submitted to the ECWG for a decision as to whether the data are sufficient for preparation of a final report by the evaluators. If data gaps exist, test items are obtained from the foreign government by way of loan, lease or purchase; test plans prepared, and limited developmental and/or operational tests conducted. If testing is expected to be outside the original design envelope; for instance, in extreme cold and hot weather conditions, it is advisable to purchase the test items so special requests to the foreign developer, with his veto authority, are not

required, and repair/refurbishing is not required of the test items. Developmental & operational testing will normally be combined or integrated for Phase II. At the end of the testing and evaluation phase, test reports are prepared and Service approval sought, for one of the following options:

(1) To accept the item as meeting U.S. requirements and to acquire the item by direct buy or coproduction.

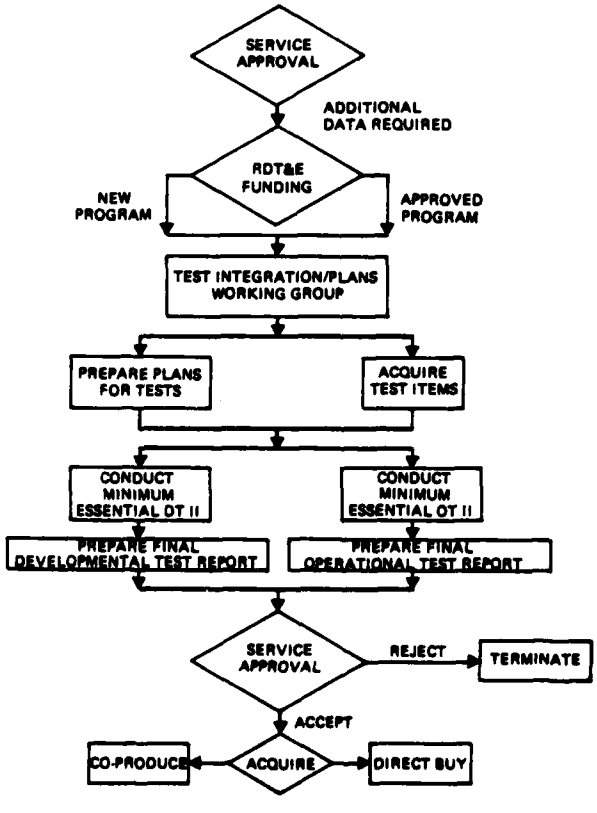
(2) To reject all items and terminate the effort.

(3) To continue to monitor development of the item or items by the foreign country.

(4) To acquire additional data by proceeding with Phase III for one or more foreign items.

When alternative (4) is the decision, Phase III (Flow Chart, Figure 11-4) is conducted with the existing developmental acquisition procedures for full-scale engineering development. An Army test integration working group (TIWG)

FIGURE 11-4. FWE PHASE III



or Air Force test plans working group (TPWG) replaces the ECWG. The TIWG/TPWG prepares a coordinated test program to accomplish the minimum essential DT/OT before milestone III.

Funding for Phase I can be from FWE project funds. Funding for Phase II, to include the cost of obtaining test items, spares and repair parts, technical support, and conduct of the technical feasibility tests are from FWE project funds. Funding for Phase III is provided through the normal materiel acquisition planning, programming and budgeting system (PPBS). The funds for Service headquarters approval are provided by the attendees' mission allocations.

INTERNATIONAL COOPERATION ON TEST AND EVALUATION

Initial agreement was reached 9 October 1978 between the United States and the United Kingdom as Annex II to the original memorandum of understanding (MOU) between the two governments, dated 24 September 1975. Annex II, entitled "Mutual Acceptance of Test and Evaluation" allows acceptance of data from the other government's official test program. The MOU annex lists the focal point for all DT&E aspects as the U.S. or UK project manager for the equipment and all OT&E aspects as the U.S. Services' independent operational test agency and the UK project manager. The common documentation format is similar to the U.S. Navy's test & evaluation master plan (TEMP) as outlined in OPNAV Instruction 3960.10. For systems under development, participation will be invited early in the T&E program. Subject to legal, policy and proprietary rights, release of T&E information and all pertinent T&E data will be arranged. If one government ascertains that the T&E is inadequate, mutual agreement on additional testing is required. Before additional testing commences, the United States and United Kingdom must reach agreement on payment of costs, use of resources, and scheduling and evaluation criteria. Each government agrees 1) to protect the data submitted in confidence by the other government; 2) to mark the data transmitted with a legend indicating country of origin, conditions of release, and security classification; and 3) to insure the data, held in confidence, are for information and evaluation and no other purpose, in the absence of any specific agreement to the contrary. When agreement cannot be reached between the focal points of their Service superiors concerning the acceptability and adequacy of T&E, referral to the Director Defense Test & Evaluation (U.S.) and appropriate Systems Controller (UK) is required.

Representatives of the United States, United Kingdom, France and Germany have prepared a draft memorandum of understanding (MOU) on the mutual acceptance of test and evaluation. The objective of this Four-Power MOU is the elimination of unwarranted duplication in testing of defense equipment offered by one of the countries for acquisition by the others. Signatories would be obligated to review, but not necessarily accept, testing already accomplished by the offering country before undertaking any further testing. The proposed Four-Power MOU is thus analogous to the existing U.S./UK bilateral agreement. The governments' focal points for T&E aspects will be:

For DT&E

(1) The French technical director concerned,

(2) The German Projektbeauftragter/Projekt Ingenieur,

(3) The UK project manager,

(4) The U.S. program manager.

For OT&E

(1) The French Service department official responsible for the project,

(2) The German Service department official responsible for the project,

(3) The UK project manager,

(4) The appropriate U.S. Service independent operational test agency.

The format is to be similar to the test and evaluation master plan (TEMP) as outlined in DoD Directive 5000.3. Referral of cases where agreement cannot be reached are:

(1) For France, the DGA or Chief of Staff, as appropriate,

(2) For Germany, der Abteilungsleiter Ruestung/Inspekteur der Teilstreitkraefte

(3) For the United Kingdom, the appropriate systems controller,

(4) For the United States, the Director Defense Test and Evaluation.

The U.S. Army Operational Test and Evaluation Agency (OTEA) also has two ongoing initiatives in the operational testing arena. The first is an agreement on test and evaluation terms, procedures, data requirements, and methodology for multinational testing. It is felt that duplication of testing can be avoided and differing test requirements of the multinational testing partners accommodated by conducting part of the T&E cooperatively. The selected approach is to obtain agreed common international test and evaluation procedures, similar to the usual procedures of the partners, so that even if a cooperative international OT&E is never conducted, the procedure will be useful in information exchange. This first initiative is being done in conjunction with DARCOM. The second initiative concerns differences in tactics, battlefield representation, and military organization, which makes it difficult for nations to accept each other's operational test data. The approach is to develop an agreed-upon operational test scenario for NATO use under realistic battlefield conditions, including the electronic warfare (EW) threat and survivability, so that any nation testing under the agreed scenario could assume its test results would not be rejected on grounds of battlefield representation.

Representatives of the United States and Germany have prepared a draft Memorandum of Agreement (MOA) concerning the development of mutually acceptable technical test procedures. The MOA contains annexes for tracked vehicle and environmental test procedures. It is expected that the MOA will be included as a section of the Four-Power MOU discussed above, if the MOU is ratified. The development of specific test procedures is under way.

SPECIAL REQUIREMENTS FOR TEST & EVALUATION OF U.S. CLASSIFIED ITEMS

Foreign test and evaluation of U.S. classified equipment is prohibited, unless the test is on an item approved for foreign disclosure and can be performed at a U.S. installation or under strict U.S. control that guarantees appropriate safeguards for classified information and critical technology, classified or unclassified. See Chapter 14 for information disclosure policy and procedures. Exceptions to the above, such as sale, grant, or loan of single classified military items for test and evaluation under foreign security control, may be authorized only when the proposed disclosure is authorized, and all of the following criteria are fulfilled:

- There is no transfer of sensitive technology that the United States would not license for manufacture abroad.

- There is no release of equipment that would not be approved for foreign sale or export, if requested.

- The release shall result in benefits to the United States at least equivalent to the value of the U.S. information being disclosed. Examples:

    1. Reduce costs and avoid duplication in development efforts by the United States and its allies.

    2. Advance the objectives of standardization with and among U.S. allies by promoting cooperation in research and development.

    3. Exchange technical and scientific information of common interest on a mutually beneficial basis.

The Secretary of the cognizant Military Department, in coordination with the Office of the Under Secretary of Defense for Research and Engineering (OUSDRE), approves the exception as meeting these standards. Such actions shall be coordinated with the other Military Departments, if appropriate. The Director, Information Security, OUSDP shall be informed of each exception.

REVIEW OF DoD FWE PROGRAMS

Army Programs

The Army Foreign Weapons Evaluation (FWE) program was initiated in FY 1977. As a result of testing conducted between FY 1977 and FY 1980 two foreign systems were type classified standard A; i.e., adopted for Army use. These were the UK combat support boat which is being used as the US Army bridge erection boat and the Norwegian M72A3 Light Antitank Weapon (LAW). A contract was awarded in September 1980 for 120 support boats. The decision to purchase 100,000 LAW rounds has been approved by Congress. The German MAN truck and Swedish BA 202-206 over-snow vehicle test programs were completed in FY 1979. As a result of these evaluations the Army is purchasing over 450 MAN trucks to support several systems and procurement plans have been finalized to procure 250-300 over-snow vehicles.

In FY 1980, 16 Phase I (candidate identification phase) assessments were initiated and 25 (including continuations from FY 1979) were completed. Of these, 23 candidates did not meet minimum specifications and were terminated while two (2) other candidates proceeded to Phase II (preliminary evaluation and testing). These two were the German personal dosimetry system and the UK link reinforcement set for the medium girder bridge. Nine (9) additional Phase II assessments were initiated via other procedures: Norwegian LAW, German HOT warhead for TOW, UK combat support boat, Swiss Road Surface Compactor, Norwegian M-11 canister, German NBC contaminated area marking set, German 5.56 plastic training ammunition, German 4.2" mortar training device and the Norwegian Sanator lightweight decontamination system.

New Phase II evaluations to be initiated in FY 1981 are: the German decoy system for US Hawk, Norway M9A1 protective mask, German large caliber borebrushes, and the German DM 82 hand grenade fuse. Additionally, five Phase II test programs are continuing from FY 1980: the German .22 calibre rim-fire tracer ammunition, German .50 caliber plastic training ammunition, climatic and effectiveness evaluation of the Norwegian (Raufoss) 20 mm M70 cartridge design, Canadian/Japanese/UK smoke pot evaluation, and the UK Giant Viper mine clearing line charge. The Army also anticipates the initiation of several Phase I programs including the UK kinetic energy recovery rope, foreign sled/skis for vehicles, and a UK equipment trailer, German float/sink hose, UK Mexeflote/Uniflote sectionalized barges, German Swingfire heater, body armor, heated hardware, UK portable water chiller, portable digging and cutting tool, and UK front and side loading electric forklift.

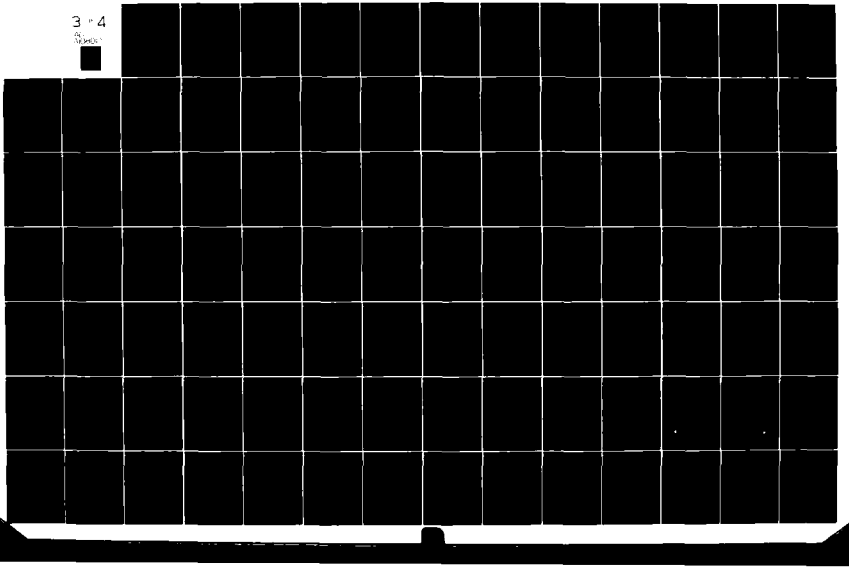
Navy Programs

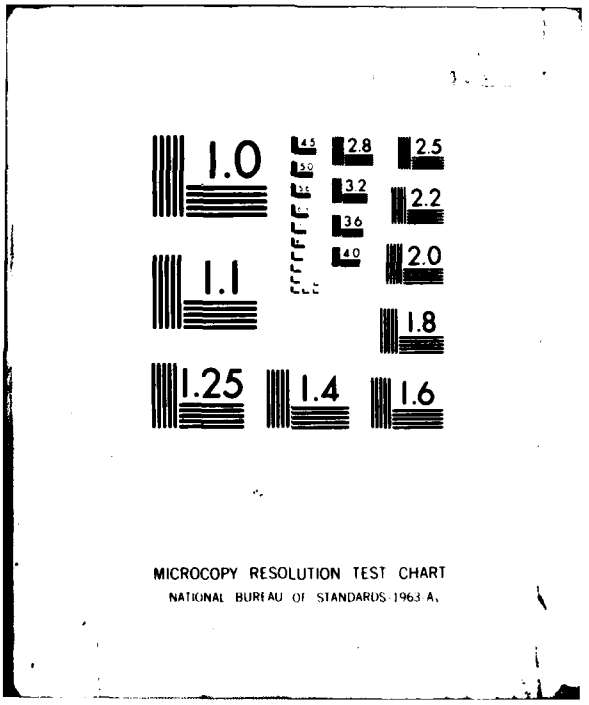
The Navy's Foreign Weapon Evaluation program was initiated in 1975 with the testing of an Italian OTO Melara 76mm Gun System and a modified Netherlands SM-25 Fire Control System. Other systems tested by the Navy included an Australian gun velocimeter, the United Kingdom XJ-521 missile, a Canadian high speed craft sonar, and a French aircraft altitude reference system. The Norwegian Penguin Missile System testing was also initiated under the Navy FWE program and has since been transferred to another Navy program element.

The Navy's FY 1980 program concentrated on the evaluation of several foreign 76mm VT-RF fuse candidates; the Canadian SHINPADS (Shipboard Integrated Processing and Display System) data processing and transfer system; several foreign aerial, seaborne, and tow target systems; .50 caliber Raufoss multipurpose ammunition effectiveness and safety; a foreign long wavelength infrared (LWIR) seeker system; and the multi-national Vertical Launch Sea Sparrow system.

In FY 1981, the Navy FWE program included the continuation of the Vertical Launch Sea Sparrow, SHINPADS, Raufoss ammunition, Navy targets, and 76mm fuse candidates. New FY 1981 programs include the Swedish Carl Gustaf 84mm recoilless rifle, the United Kingdom Osbourn Mk 1 acoustic minesweeping system, the French PAP 104 mine neutralization system, the French Durandal airfield attack weapon, and a foreign radio communication equipment set being considered for use by the Marine Corps.

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JOINT LOGISTICS COMMANDERS GUIDE FOR THE MANAGEMENT OF MULTINAT--ETC(U)
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To date, two major systems, the OTO Melara gun and the SM-25 fire control system have been procured by the Navy and installed aboard Navy vessels. The Penguin missile is undergoing continuing operational evaluation. The SHINPADS evaluation is basically a state of the art technology study but it has proven to be exceptionally beneficial in that data from this program and similar ones are forming the basis for new ship data processing system designs.

Air Force Programs

The Air Force Foreign Weapons Evaluation (FWE) program was initiated in the early 1970's. Early test programs evaluated the French Matra 250kg high drag bomb, the interoperability characteristics of the GAU-8 30mm ammunition with the Swiss Oerlikon KCA gun system, and the Raufoss multipurpose or fuseless high explosive ammunition concept (MPC). Additionally, screening tests were conducted on seven foreign 9mm handguns.

The FY 1980 program was directed at an in-depth evaluation of the Canadian CRV-7 rocket, French BAP 100 and Durandal airfield attack weapons. Additionally, in FY 1980 the AF initiated the evaluation of Israeli munitions handling equipment and a joint Navy/AF evaluation of a foreign long wavelength infrared (LWIR) seeker. The planning phase of a 12-month Raufoss ammunition evaluation program was also begun. This evaluation will concentrate on the manufacturing and technical data base required to support the newly-signed manufacturing license agreement with Raufoss of Norway, and will specifically investigate application of the Raufoss concept to GAU-8 30mm ammunition.

The following is a description of the present status of USAF FWE programs:

a. Licensing rights to Norwegian Raufoss MPC ammunition has now been obtained by the U.S. through a tri-service funded effort.

b. The Italian Beratta M925-1 9 mm was selected as the best candidate foreign handgun.

c. Evaluation of the Canadian CRV-7 and French BAP-100 airfield attack munitions has been completed. These munitions are not suitable for U.S. use.

d. Durandal testing has shown promising results during extensive testing against runway targets. Additional weapons are being procured for further evaluation as well as certification on the F-16, F-111, and F-4 aircraft. The Navy will also evaluate Durandal from their A-6 aircraft.

e. The long-wavelength IR missile seeker evaluation has been terminated due to poor results.

f. Evaluation of a 30 mm Raufoss MPC round has been initiated.

g. An evaluation of a German MBB sideways ejecting submunition is being initiated in conjunction with the USAF Low Altitude Dispenser (LAD) program.

h. The German STABO runway cratering submunition has been proposed for USAF evaluation. This submunition could be employed in conjunction with various U.S. delivery systems such as LAD.

FY 1982 DoD Planned Program. Primary emphasis will be placed on two issues. First, continued attention will be directed to increasing Service participation as a means of improving the quality of selected FWE candidates and, in turn the probability of subsequent adoption by the nominating Service. In addition, stress will be placed on using existing Memoranda of Understanding and similar documents which provide for free exchange of existing T&E data and loan or lease, rather than purchase, of test hardware. FWE activities for FY 1982 will include initiation of new programs to be selected in September 1981, as well as continuation of such FY 1981 programs as the evaluation of Raufoss ammunition, German submunitions, the Durandal airfield attack munitions, the UK Osbourn acoustic minesweeping system, the French PAP 104 mine neutralization system, and low cost NATO country naval targets.

CONCLUSION

Sound evaluation of foreign weapons must be an integral part of an RSI program aimed at attaining greater commonality of weapon systems among the NATO nations. Special funds and procedures have been set up in DoD to support Service testing of foreign weapon systems. Compromises may have to be accepted in the name of RSI when evaluating and selecting foreign weapons for U.S. forces.

12. MANUFACTURING AND PRODUCTION

INTRODUCTION

The ultimate success of a multinational program is often dependent upon the level of effectiveness attained in the manufacture of the system under development. A number of the policy and procedural aspects of international production arrangements have been covered in Chapter 2, Major RSI Approaches. This chapter of the guide will be concerned with a description of the production environment within Europe that can serve as a baseline for an approach to the transfer of process technology between the participants, concepts of manufacture, and product assurance requirements.

GENERAL CHARACTERISTICS OF EUROPEAN DEFENSE INDUSTRY

One of the most important characteristics of European defense industry is its division among three "tiers" of countries. The three most industrialized countries of Western Europe--Germany (GE), the United Kingdom (UK), and France (FR)--representing only about 54 percent of the population of NATO Europe, account for about 80 percent of its arms industry output. The next three most industrialized and populous states--Italy, the Netherlands, and Belgium,--representing around 25 percent of NATO European population, account for another 12 percent of its arms industry output. The other seven states of NATO Europe--Turkey, Greece, Portugal, Denmark, Norway, Luxembourg, and Iceland--represent about 22 percent of the population and less than 8 percent of the arms industry output of NATO Europe.

Two of the first tier states--France and the UK--have been significant net exporters of arms throughout the 1970s, indicating that their defense industries enjoy a market larger than their national consumption. Although GE was a net importer of arms for most of the 24 years since it became a member of NATO, it has become a net exporter of arms within the last three years. Like the GE defense industry, the second tier state defense industries have traditionally been smaller than sufficient to meet their own national demands, but, in recent years, have expanded to just about balance national demand and total defense production capacity (in monetary value) in the case of Belgium and the Netherlands and, in the case of Italy, to become a consistent net exporter of arms, also.

Most studies have focused on the defense industries of the first two tiers of states: the "first tier" countries: GE, the UK, and France; and the "second tier" countries: Italy, Belgium, and the Netherlands. The first tier countries have received most attention since they alone account for about 80 percent of European defense industry. Besides their relative importance in size and their roles--especially France and the UK--as arms exporters, the first tier countries also have national armaments industries that cover a broad spectrum of technologies and types of weapon systems. The latter characteristic does not apply to any of the second tier and definitely not to any of the seven who constitute the third tier. Moreover, the second tier countries, in contrast to the third tier, include individual companies that have long been exporters or suppliers of specialized weapons and equipment to other NATO partners and to countries outside of NATO.

By national policy, the French defense industry encompasses the broadest spectrum of types of armaments and their associated technologies. This breadth of coverage of French defense industry is a reflection of the national desire for policy independence or equality with other NATO partners. Thus, French defense industry covers the gamut from independent nuclear weapons and strategic missiles development and production to small arms and ammunition. British defense industry covers almost this entire gamut also--and for similar reasons--except strategic missiles. In nuclear weapons development and production, the UK still enjoys a special relation to the U.S. as well as an independent capability. German defense industry has, by national policy and the protocols by which in 1954 it joined the Brussels Treaty that established the Western European Union, foresworn nuclear weapons development and production and strategic missiles. German aerospace industry had been restrained by earlier national policy from rapid rebuilding, although it now enjoys substantial government support.

For these first tier countries, codevelopment is the sine qua non of multinational collaboration, including cooperative arrangements with the U.S. Such an insistence has long been customary for the British and French industries, which are the two largest and best developed in Western Europe. However, the German industry and government, which until recently have been ready to accept U.S. licenses without any codevelopment participation, are now becoming much more insistent that codevelopment must be a fundamental part of any future transatlantic collaboration and--furthermore--that such collaboration should probably be carried out between a European multinational consortium and the U.S. rather than on any purely bilateral basis.

There appears to be a general view that future collaboration among the first tier countries (GE, UK, and France) will be more readily achieved in the field of tactical missiles than of manned combat aircraft. This does not mean, however, that there is any lack of interest in establishing collaborative arrangements for manned combat aircraft, a subject which is occupying senior industry managers and government officials in a great deal of preliminary negotiation. The point is made, however, that tactical missiles have a shorter development cycle, cost less, and have the types of very precisely and narrowly-defined missions which make the harmonizing of requirements much easier than those of aircraft. Because manned combat aircraft are so versatile and combine so many different roles and missions, the harmonizing of requirements is especially difficult--particularly in view of the long life cycles and heavy financial commitments involved.

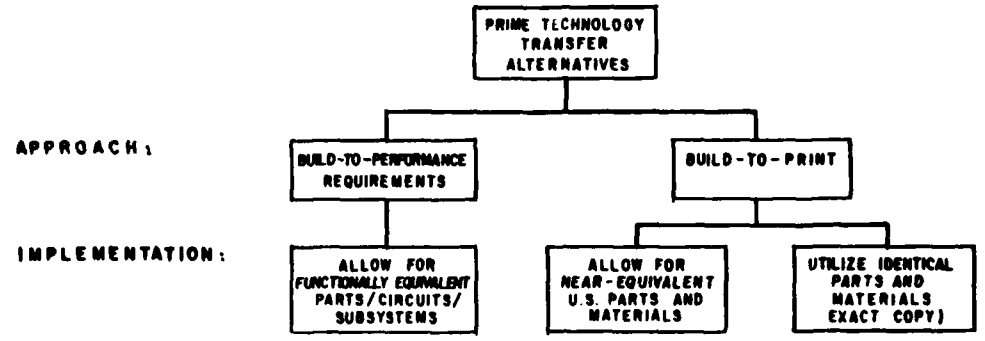
CONCEPTS OF MANUFACTURE

There are two basic concepts of manufacture for transitioned material; build to performance requirement or build to print. The program manager needs to specify carefully the approach which is to be taken on the program to be managed. Figure 12-1 illustrates some of the fundamental differences in these two approaches.

Build to Performance Concept

If it is determined that the receiver of the technology transfer, the follower, is to utilize a build to performance approach, this will allow the substitution of functionally equivalent parts, circuits and subsystems.

FIGURE 12-1. ALTERNATIVES FOR TECHNOLOGY TRANSFER, FABRICATION AND TEST (TTF&T)



INTERNATIONAL STANDARDIZATION	INTERCHANGEABLE AT WEAPON SYSTEM LEVEL ONLY	INTERCHANGEABLE TO LOWEST REPLACEABLE ASSEMBLY LEVEL	INTERCHANGEABLE TO BIT AND PIECE LEVEL
NATIONAL STANDARDIZATION (PARTS AND MATERIALS COMMON WITH EXISTING U.S. INVENTORY)	HIGH	NOMINAL	LOW
TECHNOLOGY TRANSFER, FABRICATION AND TEST (TTF&T) COSTS	0.96 TO 2.0	1.0	1.6
PRODUCTION AND SUPPORT COSTS	0.95	1.0	1.3
MODIFY FOR U.S. PRODUCIBILITY	CURRENT WITH TTF&T	CONCURRENT WITH TTF&T / SUBSEQUENT TO TTF&T	--
PROGRAM RISK	HIGH	NOMINAL / LOW	LOW
EURO. TO U.S. TECH. TRANSFER EXAMPLES	GERMAN-FRENCH AN/TPS-58 GROUND RADAR (ITT-GILFILLAN); BRITISH CANBERRA (B-57 MARTIN)	ROLAND (HUGHES)	DUTCH MARK 92 FCS (SPERRY)

There are many differences within the parts and subsystems which would be specified on a foreign design as opposed to a U.S. generated design. On the Roland program, for example, it was determined that there were 83 types of steel utilized as opposed to 28 standard types of steel used in the U.S. For aluminum, the European design utilized 21 types versus 14 U.S. standard types and 28 types of copper alloys versus 13 U.S. standard types. For fasteners, the design specified 559 different part numbers whereas the U.S. has standardized on 353 different part numbers.

In Figure 12-1, relative cost for the different approaches is illustrated by taking the near equivalent, build to print as the baseline approach with a cost index of 1.0. The alternative approaches are given cost indices which reflect their cost as compared to this baseline. For example, the production and support cost for an exact copy build-to-print approach is estimated to involve a cost 1.3 times as great as would be incurred for a near equivalent build-to-print approach for the same system. For other comparisons, such as national standardization and program risk, a particular case is shown in Figure 12-1 as representing the nominal case and the other approaches are measured relative to the baseline approach.

With this great diversity and the differing design approaches discussed in Chapter 9 on Engineering Management and Technology Transfer, the direct introduction of a foreign design requires some loss of standardization within the equipment of the receiving nation. If the receiver elects to allow substitution of functionally equivalent parts and components common to other nationally deployed systems, the level of standardization within the country and its logistics system remains high but the transferred system is often then interchangeable with other nations at the weapon system level only. The cost for the technology transfer, fabrication and test (TTF&T) becomes much less predictable and program risk grows.

It is reasonable to expect that the production and support costs for this type of technology transfer will be lower due to the combination of nationally common parts usage and the greater freedom to redesign for producibility during TTF&T. Although examples of technology transfer of major European weapon systems to the U.S. are few to date, two are notable which were transferred using the performance requirements as the key criteria. The first was the British Aircraft Canberra which became the USAF B-57 produced by Martin, and the second was a German-French ground radar, AN/TSP-58, which did not enter U.S. production.

Martin extensively modified the Canberra to satisfy U.S. performance and producibility requirements including a new cockpit and substitution of U.S. electronic systems. The cost to place the B-57s into production approached the cost of a new aircraft development.

The second notable example of technology transfer was the French ground radar wherein the U.S. contractor performed extensive modifications during the technology transfer phase to adapt for U.S. producibility and also to improve numerous circuit design characteristics. However, the aggregate impact of these changes, many of which caused ancillary performance impacts not fully appreciated at the time, was so devastating to the overall system performance, that the military deemed the prudent course was to cancel the program.

Build to Print Concept

The build-to-print approach has two options. One is to allow for near equivalent parts and materials and the second is to utilize identical parts and materials as the original design. The former approach is based on the assumption that total multinational interchangeability usually is not feasible at the repair part or material level. But this does not mean that standardization of parts and materials is to be ignored. On the contrary, it is commonality of parts, materials and processes that will ultimately determine the degree to which the systems are alike. The formulation of a strategy for parts selection should be of primary concern. The project office must provide guidance to the receiving contractor with the responsibility for technology transfer.

Standards must be defined against which parts comparisons can be made. The following classifications were used on a major program:

- U.S. Near Equivalent Part - A part manufactured in the U.S. that has all the required properties of its European counterpart but

in some way is not identical (e.g., a U.S. capacitor may have the same electrical properties but be slightly larger, or the material used in a U.S. product may be slightly harder or possess a different finish than the European counterpart).

- U.S. Exact Equivalent Part - A part manufactured in the U.S. that is an exact duplicate of its European counterpart.

- European Exact Part - A part manufactured in Europe which is identical to the part used in the European system.

One recommended procedure for parts selection includes the steps listed below:

- As transferred data are received, the responsible contractor or Government activity would screen the follower's material system for national exact equivalents of the parts, processes or materials described in the data. If successful, the follower drawing is so annotated.

- If an exact national equivalent cannot be found, then a near equivalent part would be sought. However, any such selection would need approval by the project office on a case-by-case basis.

- As a last resort, a leader country exact part is selected if a follower exact or near equivalent cannot be located or the near equivalent is not acceptable. The project office again should have the final approval authority.

The process of identifying parts and components for use on the transferred system is painstaking. There are no shortcuts. Screening and searching for identical or near identical parts is laborious work and requires great patience.

What this approach offers is a balance between the benefits of international and national standarization. The expected outcome is a system which is interchangeable with the original at the lowest replacement assembly level. It also allows for some consideration of producibility both during and after TTF&T, but this effort is somewhat constrained due to the limitations of maintaining near equivalence. Program risk level is somewhat responsive to the degree to which producibility considerations are addressed during TTF&T as opposed to waiting until the fabrication and test have been completed. Producibility improvements can be included during TTF&T but the program manager should assure that the technical personnel have addressed the issue of potential impact on system performance.

The approach used in Roland parts conversion was to select parts that would not impact international interchangeability at the module level, and at the same time utilize a maximum number of U.S. military standard parts. Accordingly, the following order of precedence was established in parts selection:

1. Direct Equivalent -- MIL-STD or Service Common Item

2. Direct Equivalent -- U.S. commercial

3. Near Equivalent -- MIL-STD item

4. Near Equivalent -- U.S. commercial

5. Exact European item

Thus, when a European drawing was received, the European parts were first defined, and then a search was made of MIL-STD and Army Common parts to find a direct equivalent part. If no MIL-STD direct equivalent could be found, U.S. commercial parts were searched. U.S. direct equivalents (either MIL-STD or commercial) were found for approximately 80 percent of the European parts, but in the event no direct equivalent could be discovered, a search was made for near equivalent parts that would not negate an interchangeability requirement or detrimentally alter performance. Three levels of approval are required to utilize a near equivalent part.

1) The component engineer must select the near equivalent part as so near that no degradation will occur. In many instances the differences are such that the part is actually better.

2) The responsible circuit engineer must agree that this near equivalent part is indeed completely acceptable.

3) The difference must be documented and approved for use by the Missile Command senior representative.

The difference between an equivalent part and a near equivalent part is minor and in many instances very trivial. A capacitor which is round instead of square but exact in all other characteristics is considered a near equivalent. A resistor that is 82K±5% instead of 81K+10% but alike in all other characteristics is a near equivalent. It would make no sense to bear the cost to implement manufacture in the U.S. for the exact European part when completely acceptable near equivalent parts are available from military inventories. The part implementation, supply, and additional logistic costs of stocking a unique part for the 4000 near-equivalent parts would be substantial (e.g., costs incurred if the exact copy approach was adopted).

As an example, the prime hardware parts conversion process on Roland has resulted in the following parts count:

	HI-REL MIL-STD	Commercial	Total
U.S. Direct Equivalent	36,800	18,000	54,800
U.S. Near Equivalent	3,800	200	4,000
European Exact Parts	--	9,430	9,430
	40,600	27,630	68,230

In the Roland case, if neither a direct nor a near equivalent U.S. part could be found, the exact European part was selected. Where a U.S. part supplier could procure or build tooling at a low cost to provide the exact

European part, the TTF&T program qualified the supplier and procured the parts. However, in general, because the TTF&T quantities were so few, the amortized tooling costs made the part price substantially higher than direct procurement from Europe. Therefore, the Army authorized, on an item-by-item basis, foreign procurement as long as a potential U.S. supplier was identified who could be qualified subsequent to TTF&T.

The second option under build-to-print minimizes program risk by producing a system identical to the original down to the piece part and material level. This approach can be extremely expensive unless the European system already uses predominantly U.S. parts. This condition was satisfied on the Dutch Mark 92 Fire Control System for which Sperry is the U.S. licensed contractor. The Dutch radar was designed to the requirements of the British Navy which, in almost every respect, are identical to those of the U.S. Navy. This radar from inception was designed for world-wide deployment and world-wide environmental requirements and utilizes 85 percent U.S. parts. Thus, the technology transfer required only very minor changes to accept 100 percent U.S. items. At this time, it is understood that the U.S. Navy is pleased with the technology transfer of the Dutch radar.

The general case of U.S. production of a European developed system will probably be closer to the Roland program relative to the parts situation. For Roland, a study was performed by the U.S. Army and the contractor as to the costs of building an identical replica. This study showed that the TTF&T costs would have increased by $52.5 million. If the exact copy were placed into production, the increased production costs would be $92 million and the increased support costs $95 million, over a ten-year period.

PRODUCIBILITY

As has been experienced on a previous TTF&T program, attempting to adapt a foreign-produced design to U.S. automated production equipment concurrent with technology transfer can mean high risk. On Roland, it has been found that after the contractors have built and extensively tested the hardware at the module, unit, subsystem and finally system level, their knowledge and grasp of the critical parameters, performance attributes, and error budgets is measurably greater than when the drawings were initially released to fabrication. Thus, with minimal program risk the contractors can now proceed to adapt that part of the hardware design to automated fabrication where it offers substantial reduction in recurring production cost.

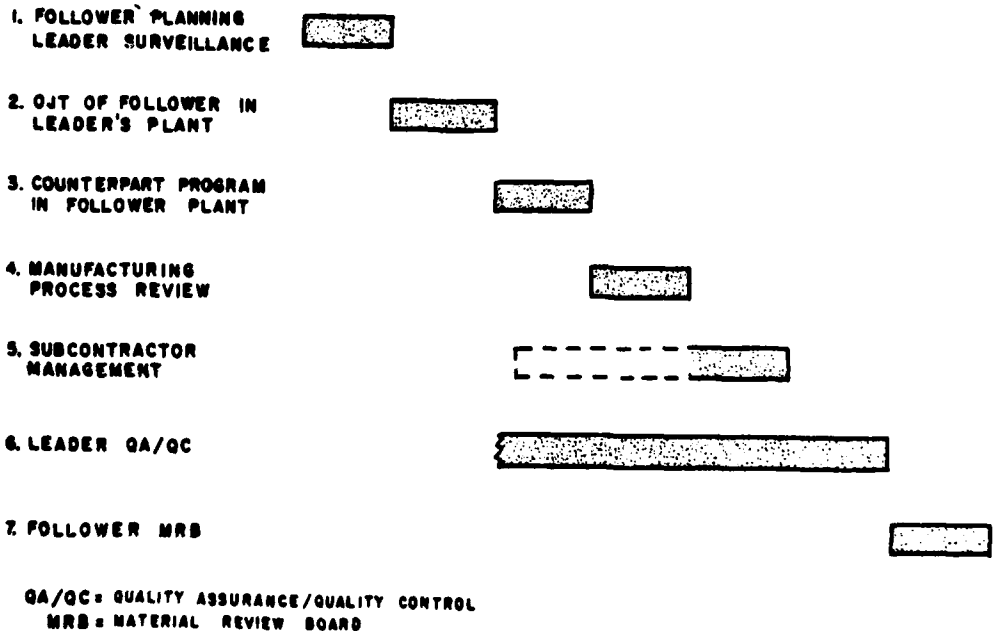
There is no best approach to selection of the manufacturing concept. In each case the program manager should attempt to balance the need for both inter-and intra-national standardization with the performance capabilities of the system as originally designed. The build-to-print approach will generally yield a system whose performance closely models that of the originally developed system. If there are pressing operational reasons to modify the design and the consequent performance, or the manufacturing processes utilized on the original design are not well-defined, the program manager may wish to utilize the build-to-performance requirement approach. The basic production decision needs to be evaluated by risk analysis to determine that specific approach which is most appropriate for the system to be transitioned.

PROCESS TECHNOLOGY TRANSFER

The process involved in the basic transfer of technology has been described in Chapter 9 of this guide. It is important to recognize that merely transferring the documentation describing the weapon system and its manufacturing processes will probably be insufficient for the second source, or licensee, to accomplish the manufacturing task. There is a certain amount of the technology which is imbedded in the personnel and operating procedures of the original manufacturer. To achieve a successful multinational program involving transferred technology, this imbedded technology must also be transmitted and made available to the receiving company. For purposes of our discussion, we will use the generic terms of leader and follower, with the technology flowing from the leader to the follower.

Figure 12-2 illustrates a structured approach to the problem of transferring process technology from the leader to the follower. The model of Figure 12-2 presumes that the formal process of documentation transfer has been accomplished or is being accomplished in concert with the process technology transfer. In phase 1, the follower company begins preparation of the planning for the initiation of manufacturing operations. As the follower reviews the transferred documentation, certain problems in understanding will arise due to the fact that manufacturing processes and techniques tend to be

12-2. PHASED PROCESS TECHNOLOGY TRANSFER



facility and equipment dependent. They have evolved based upon the capabilities and facilities of the developing company. Transplanting of these processes may require that the personnel from the leader company provide background information on how and why the processes have been developed in their particular fashion. This provides, to the follower company, a basis for integrating the processes into its method of operation.

After the initial planning has been completed, selected manufacturing personnel and technicians from the follower company are assigned to the leader's plant for on the job training. The purpose of this phase is to provide a cadre of key personnel within the follower company who have had first hand exposure to the processes and techniques of manufacture. They are able to compare the process as it is described within the documentation with how it is practiced on the shop floor. Where the actual practice goes beyond that described in the formal documentation, there is an opportunity to absorb this information. In addition, some of the shop subleties involved in "fine tuning" the process for optimum performance can be observed. Having established an increased level of process understanding these people are able to return to the follower plant for phase 3.

In phase 3, the follower becomes responsible for the detailed manufacturing planning and operations but is supported by "counterparts" from the leader company who are assigned to the follower plant. This allows the key people in the follower company to develop their capabilities and responsibilities by managing the manufacturing function, but having available the advice and assistance of leader company personnel.

After the follower company and its key personnel have become confident in their ability to manage and control the manufacturing processes, a Manufacturing Process Review is accomplished as phase 4. The objective of the Manufacturing Process Review is to establish that the follower has attained a clear and complete understanding of the processes, that the processes have been integrated into the follower's operation and that they are yielding acceptable parts. The result of the Review is a set of validated process instructions, in a format usable by the follower.

Upon completion of the Review, phase 5 begins with the follower taking full responsibility for the management and expediting of subcontractor deliveries. The leader retains a larger share of the responsibility for determining the acceptability of subcontracted parts and materials and the evaluation of the suppliers' in-process controls.

One caveat is in order. As a result of differences in order lead times between the U.S. and Europe, there may be a need for the phase 5 activities to start earlier. Given the propensity of the U.S. defense industry and the European defense contractors to use extensive groups of subcontractors, the success of the program often is critically dependent upon managing successfully the subcontract effort. As the follower increases his ability to manage the subcontract effort, responsibility for the quality assurance of subcontractor effort can be transitioned in phase 6 to the follower.

The transition of process technology ends with phase 7 in which full Material Review Board authority is being assumed by the follower. This Board is the vehicle which decides disposition of those parts which do not meet the

subordinate level design requirements. Since the disposition of the parts often is to "use as is," the assumption of this authority by the follower represents a statement that they have sufficient design and process understanding to make accurate, effective disposition decisions.

The model for process technology transition described herein is only one of many ways to achieve the desired result. The critical issue, identified in a number of lessons learned studies, is that the process must be preplanned and carefully monitored. Design and manufacturing practices vary and the grafting of "foreign" processes into an existing manufacturing organization is a delicate process with high risks. Clearly specifying the mechanism and timing for this effort can make a major contribution to program risk reduction.

OPERATING VARIATIONS

While there cannot be a characterization of European (or U.S. for that matter) manufacturing practices as homogeneous among the various countries, certain distinctions can be made between general approaches in the U.S. and Europe. These general differences can be characterized in a number of ways. There are differences in business organization, shop practices, and personnel practices. These differences have been introduced in Chapter 4 on the European Overview. The intent in this chapter is to explore some of these differences as they may impact a multinational production effort.

Business Organization

Two common observations by Americans about European defense industry are: (1) European companies have a much more intimate and "sole-source" type of relation with their government than U.S. companies; and (2) intellectual property rights to data, technical drawings, inventions, and the like that derive from defense contracts typically reside with the company and not with the sponsoring government. These differences complicate transatlantic industrial collaboration in defense systems development and production where technology transfer under license may be involved.

European Government-Industry Relations. With respect to the status of European defense industry vis-a-vis their governments, a variety of organizational and legal forms characterize that status. Whereas in the U.S., defense industry is composed principally of independent industrial corporations whose stock is publicly owned and traded, key industries in the UK and France, in particular, are nationalized companies that are wholly or majority government owned. The tradition of private ownership obtains through most of the rest of Western Europe and, in the case of the electronics industry, generally throughout Western Europe. Individual companies, as in the U.S., are frequently wholly or majority owned subsidiaries of holding companies or conglomerates, some of which may be foreign-owned multinationals. With few exceptions within these patterns of ownership, individual companies are run by professional corporate managers who are fundamentally employees rather than owners or, in the case of government-owned companies, civil servants.

Besides such companies or corporations with varying degrees of public accountability and liability, government establishments, such as the Royal Ordnance Factories in the UK, also play an important role in several

Western European countries. Within the nongovernment establishments, there tends to be a lower level of capital investment than in comparable U.S. companies. The emphasis is on labor's contribution to value added, rather than on capital equipment. There is also a general tendency to shift more of the risk in financing work-in-progress to the customer. Where progress payments are utilized, they tend to be at the 90 to 100 percent level rather than the 80 percent rate common in the U.S.

The relation of European defense industry to the governments of Western Europe is a function of markets and broad government policy as much as of ownership and organizational/legal forms. Since national markets for European defense industry are only on the order of one-tenth to one-eighth the size of that in the U.S. even for the big three, no European country can sustain more than one to three companies in the defense sector. Since purchasers of exports are reluctant to buy any weapons that have not been procured by the armed services of the supplying nation, exports do not relieve this problem of the critical market size to sustain more than one or two competitors. The size of the national market, thus, confers on virtually all European defense companies almost a "sole-source" status with respect to their governments.

The sole-source or chosen-instrument character of major European defense companies does not, however, necessarily reduce their dependency on export markets for their financial and economic health. The large export business of the major aerospace companies of the UK and France--typically between 40 and 50 percent of total output--are accepted as normal and essential augmentation of production to give reasonable return on the high R&D and capital investment costs for aerospace development. In several cases where larger production runs are not so important for reducing unit costs--such as in the small arms industries in Belgium and Italy--military exports may still be important and are encouraged by the government, not only to promote the health of the individual company but to help balance the military trade account for those countries who must import other defense equipment.

Intellectual Property Rights. A significant characteristic, if not a consequence, of the national market size of European defense industry--which has only one or two suppliers per country for any type of weapon system--is the disposition of intellectual property rights or data rights.

When the U.S. government, with alternative sources of supply, funds a development program, it generally seeks or requires sufficient data rights so that it can award a production contract to a second source on a competitive basis. There are few or no opportunities to go to a second qualified source for production of a weapon system--even one developed by government funding--in Europe. European governments, unlike their counterpart in the U.S., have far less incentive to own or acquire rights to a technical data package, especially if acquiring and documenting such rights and data add to the cost of a development. Data rights, including much of what in the U.S. would be considered foreground rights, usually are left with the developing company in Europe along with company-proprietary data. Moreover, the government of a European country would not typically require a technical data package beyond what would be required for field-level maintenance--let alone alternative production.

Clearly, both aspects of the relation of European defense industries to their governments--the sole-source type of relationship and the disposition of data rights in the companies--complicate transatlantic defense cooperation.

Consolidations and Collaboration. For the UK and France--especially in the vital aerospace sector--industrial rationalization has meant an evolutionary process of mergers, consolidations, and nationalization of industrial organizations. Both British Aerospace and Rolls-Royce in the UK, and Aerospatiale in France, represent the culmination of several mergers of separate companies and their nationalization. It is typical of the nationalized companies of the UK and France that they do only limited subcontracting. They prefer to bring most of the development and production work into their own laboratories and factories. This tends to make them employment giants.

In the private sector, mergers and consolidations on a more limited scale have been a basic pattern in all of the first three European countries: GE, UK, and France. These mergers have remained significantly smaller than the mergers that have been nationalized, because the private companies have chosen to subcontract for large portions of their work, partly as a hedge against layoffs when work declines. This pattern of employment in privately owned companies is not likely to change much since--given the employment policies and company costs of layoffs in most European countries--the privately owned companies have a high incentive to use subcontractors to share the risks of cutbacks in orders and the responsibilities for employment stability. Thus, the business structure of the European effort under a given program will be greatly impacted by the choice of the specific European companies who will participate.

If consolidation is the principal meaning of industrial rationalization at the country level, its counterpart at the intra-European level has been collaboration. Development costs of complex, high-technology weapon systems and the limited size of national defense markets have been the principal causes of both consolidation and collaboration. Virtually every major aerospace weapon system (except the Mirage combat aircraft) developed by European defense industry in the past fifteen years has been the result of an international collaboration. The multiple role combat aircraft (MRCA), now called the Tornado, is the most ambitious of such collaborations. It included the aerospace industries of the UK, GE, and Italy. More typically the UK, France, and GE have been involved in bilateral collaborations in which the companies participating have been determined by the nature of the program and the preferences of the parties which existed at the time the agreements were consummated.

There is a determination, among the three major countries, to bring to an end the shifting patterns of industrial partnerships that have characterized intra-European collaborative programs to date. Their objective is to establish, instead, permanent teaming arrangements among the major companies to carry out the next generation of combat aircraft and tactical missile projects. This is seen as essential to overcoming problems of disclosure of intellectual property rights and to build up continuity among professionals. Emphasis is placed especially on the permanent teaming of senior research and development personnel. Manufacturing assignments will continue to be based on the equitable division of work among national industries, in order to meet national employment needs.

Shop Procedures

A sampling of some of the differences in shop operating procedures between the U.S. and Europe is shown in Figure 12-3. European dimensional tolerances, in general, are considerably looser than U.S. tolerances. This often causes some difficulty when the U.S. or the Europeans are utilizing each other's technical data packages and interpreting the specific part requirements within their usual manufacturing environment. When assembly operations are called out, there is a tendency within Europe--with its craftsmen orientation--to rely on hand-fit assemblies. In the U.S., the focus is on maintaining part interchangeability to minimize the time spent in assembling parts. Matching and selective assembly is therefore generally not required. European manufacturing, test, and inspection specifications may be adequate, inadequate or completely lacking. They may not accurately reflect the work on the shop floor. Effort may be required to correct these problems, given the technical nature of the products.

FIGURE 12-3. SHOP PRACTICE DIFFERENCES

	U.S.	EUROPE
MANUFACTURING TOLERANCES	TIGHTER	LOOSER
ASSEMBLY	INTERCHANGEABILITY	OFTEN HANDFIT
QUALITY CONTROL	MIL-SPEC	STANAG
MEASUREMENTS	ENGLISH	METRIC
TESTING	COMPONENT & SYSTEM	SYSTEM LEVEL
DRAWING CONVENTION	NATIONAL	COMPANY UNIQUE
PRODUCTION RATES	HIGH RATES	LEVEL LOADING
MATERIALS & PROCESSES	NATIONAL SPECS & STANDARDS	HIGH VARIABILITY

There are also differences between Europe and the U.S. in the test philosophy used to qualify a system for production and to maintain surveillance over technical performance. These differences span the gamut of when to test, what to test for, who will test, how many to test and where to test. In a cooperative program, it is necessary that a coordinated test program be established that satisfies the needs of all the participants. Where the program is more of a technology transfer for a developed system, questions often arise as to the degree to which the developer's test data can be extrapolated to meet the needs of the receiving country. It is also important that the objectives of the tests be clearly defined to the decision makers in OSD and the Congress to assure that no misunderstandings or misinterpretations of test results occur. Chapter 11 on Foreign Weapons Evaluation treats this topic in greater detail.

Chapter 9 on Engineering Management and Technology Transfer noted that standardization of drawings in Europe is practiced to a much lesser extent than in the U.S. However, international and national standards are used in NATO and should be understood by U.S. personnel. Of special significance are ISO (International Standardization Organization) standards and the DINs (Deutschland Industrial Norms). The Multiple Launch Rocket System (MLRS), as an example, makes use of DINs for fasteners, tubing and like items. Recognition of national differences, early in a program, will ensure appropriate planning, scheduling and funding of the technology transfer. Since drafting practices vary widely from company to company in Europe, it is important that drafting practices of the specific companies involved in the technology transfer be reviewed and understood in advance of acquiring the initial Technical Data Package (TDP).

Reconciling the metric system with U.S. production practices has not been as serious a problem as was anticipated. It has been relatively easy to train Americans to think metrically.

In general, mass production is not emphasized in Europe to the degree that it is in the U.S. This is primarily because manufacturing in Europe is considered labor-intensive, while in the U.S. it is primarily capital-intensive. Automation is the trend in U.S. manufacturing, while in Europe handfitting is still prevalent in smaller industries. This can impact on the capabilities of European manufacturers to meet U.S. delivery schedules.

It must be recognized that some industries in Europe--for example, automotive, ordnance and aircraft--are extremely progressive and can be considered as modern as any in the U.S. Production capacity may be no problem at all in these companies.

There is a frequent failure to distinguish adequately between economies attributable to scale and economies attributable to volume production. With respect to volume economies on military orders from abroad, several points need to be considered. If these foreign orders arrive after production for the domestic armed forces is completed, they will not be of much help in reducing unit costs overall. On the other hand, their late arrival keeps the assembly lines going during those periods when the domestic armed forces are not ordering very much.

With respect to materials and processes, there is a reasonable amount of standardization in the U.S. in accordance with Federal, Military and industry standards. In Europe, there is a high degree of variability. Many of the processes are derived from the U.S. standards. When this is true, transition represents a lower level of challenge. The critical point is that the program management office and the contractors involved need to look explicitly at the comparability of the U.S. and European process to be used on the specific system to be manufactured. The impact of the differences can then be determined.

The goal of a coproduction program is to develop a capability to produce the system in Europe. However, limited purchases of components from the U.S. may be necessary for the following reasons:

- The quantity desired is too small to justify the cost of tooling up in Europe.

- Delays are encountered when creating European sources.

In the case of limited purchase, it may be desirable to have U.S. acquisition agencies act for the foreign government in the source selection. This assures proper control over quality, price, and delivery. The decisions as to which European country and firm will receive contracts to manufacture the European system are for Europeans to make. The U.S. Government and the contractor should be limited to the role of technical advisors. Helping the Europeans to analyze the amounts and kinds of technical know-how needed is appropriate. Production allocation decisions are both economic and political; therefore these decisions must be made by the NATO countries.

Scheduling multinational programs is an enormous task. Sequencing the product of contractors from several countries into an end item assembly requires detailed planning and the use of sophisticated scheduling techniques. Upon request, the U.S. should be prepared to offer technical advice on network models and analysis. In the past, contract delivery schedules have created problems. Schedules appear to have been established more by negotiation than by consideration of the specific date the product would be needed for the next order of assembly in the production process. While schedule negotiations are necessary, their overemphasis can result in unrealistic and costly delivery schedules. The network scheduling techniques previously mentioned can provide a more rational basis for schedule decisions. When developing schedules for European produced items, the Program Manager should plan for longer lead times. Based on experience from the F-16, Hawk, F-104 and Stinger programs, the European sources tend to require 36 months for manufacture of items which would require 24 months in the U.S.

This issue of flow time is one of the elements which is evaluated during the Production Readiness Review (PRR) that is required on most major DoD acquisition programs. The objective of the PRR is to determine that the system is ready for production, production engineering problems have been resolved and that the producer has accomplished adequate planning for the production phase. The particular approach to PRR must be tailored to the structure of the specific acquisition program. On the F-16 program, the domestic production lines were started nearly a year in advance of the European coproduction lines. As a result, no formal PRRs were held in Europe prior to the DSARC presentation. After the DSARC presentation, several incremental follow-up PRRs were held with potential problem vendors. Also, informal PRRs were held in Europe which were officially titled "country audits." It was determined that the use of PRRs on this program was beneficial in that they highlighted areas of schedule risk at a point when there was still time to do something to minimize the impact.

PRODUCT ASSURANCE

For multinational programs, the product assurance planning is generally consistent with that conducted on U.S. systems. Preparation of a formal Product Assurance Plan with milestones serves as the method for portraying and tracking significant events during a system acquisition. It provides an effective means to disseminate information to all levels of management. Milestones to be scheduled and depicted include such events as dates for the pre-solicitation conference, issuance of letters of instruction, first article and comparison tests, and fielding and deployment plans.

A system "maturity" analysis should be performed. The "maturity" of a foreign system or its life cycle status will determine the degree of quality assurance planning required. The maturity of a system should be judged by its relative status when compared to the life cycle model. To be "mature," it must be equivalent to a fully qualified deployable system. An "immature" system would fall within the development phase of the model. The "maturity" analysis must include an evaluation of safety, reliability, maintainability and other characterstics which may not be emphasized in a European system. The "maturity" analysis is primarily based on results of tests performed on the system by the European contractor and the responsible DoD element. As a result of this analysis, the U.S. may determine that the item is ready for production with only minor system changes--such as colors and markings--or the U.S. may determine that further testing and development is required before a production decision can be made.

Product assurance testing during production should follow normal DoD practice for similar items. Tests required may include:

- First Article (preproduction testing or initial testing)
- Quality Conformance
- Comparison
- Interchangeability

The user must have an opportunity to evaluate the system for user satisfaction. Release of material to U.S. operating forces must follow established DoD policies and procedures. Section XIV of the Defense Acquisition Regulation prescribes for Procurement Quality Assurance the policies and procedures (a) to assure that supplies and services procured by DoD conform to the quality and quantity set forth in the contract, and (b) for the acceptance functions associated therewith.

STANAGS (Standardization Agreements) are agreements among several or all of the NATO members to adopt like or similar military equipment, ammunition, supplier, stores, and operational, logistic and administrative procedures. They can cover both materiel and non-materiel aspects of military forces. Material STANAGS are implemented through DoD standards and specifications. The DoD Index of Specifications and Standards (DODISS) lists, as International Standardization Documents, unclassified STANAGS. They may be obtained from the U.S. Naval Publications and Forms Center, 5801 Tabor Avenue, Philadelphia, PA 19120. Classified STANAGS may be obtained from Chief of Naval Materiel, Attention: MAT 09B21, Washington, D.C. 20360. Implementation for non-materiel agreements may be found in field manuals regulations, circulars, pamphlets, handbooks, or other administrative publications. DA Pamphlet 310-35 contains listings of agreements, standards, and related U.S. military implementing specifications and standards. A complete list of STANAGS is found in AAP-4, "NATO Standardization Agreements and Allied Publications." Approximately 600 STANAGS are currently listed in the NATO index.

APs (Allied Publications) are NATO publications covering tactics, intelligence, doctrine and procedures. Of special interest to those participating in Rationalization, Standardization, Interoperability (RSI) acquisitions

are the Allied Quality Assurance Publications (AQAPs). Like STANAGS, the AQAPs are listed in the DODISS as International Standardization Documents.

Two STANAGS are applicable to procurement quality assurance: STANAG 4107, Mutual Acceptance of Government Quality Assurance, and STANAG 4108, Allied Quality Assurance Publications. STANAG 4107 sets forth the conditions and procedures under which mutual quality assurance will be performed by one NATO country on request of another NATO country or organization. The objective of STANAG 4108 is to propose the use and standardize the development, updating, and application of AQAPs. STANAG 4108 categorizes the AQAPs into three distinct types: contractual, guidance, and informational. It also furnishes criteria for the application of the basic contractual AQAPs.

13. LOGISTICS

INTRODUCTION

Achievement of RSI goals is aided by good and early logistics planning since the attainment of RSI objectives and the accomplishment of good logistics planning are mutually reinforcing. With the advent of the RSI initiatives in DoD to strengthen NATO, many issues have developed involving maintenance and other support responsibilities and logistics management. Although this chapter is headed "Logistics", many of these support issues are addressed in other chapters of the guide, as well. This chapter considers tailoring of the logistics support process and procedures to help ensure operational readiness in NATO.

Integrated logistics support (ILS) is a unified management approach that assures both effective and economic support of a system. DoD Directive 5000.39 breaks ILS down into nine elements. These elements are:

- The maintenance plan
- Manpower and personnel
- Supply support (including initial provisioning)
- Support and test equipment
- Training and training devices
- Technical data
- Computer resources support
- Packaging, handling, storage and transportation
- Facilities

DoD 5000.39 addresses many specific objectives that ILS programs must satisfy by each program milestone. The PM should refer to Enclosure 3 of the Directive for those objectives and actions required in each phase.

Supplemental Service regulations may include additional ILS elements such as reliability and maintainability interface, survivability, and energy management. In addition, consideration should be given to applying the additional ILS elements to the management of multinational programs as well as securing the foreign country's agreement to use these additional ILS elements in their programs whenever possible. This will help improve the supportability of weapon systems, equipment, etc. manufactured by a foreign country and facilitate joint logistics planning with the U.S.

The purpose of ILS is to ensure that logistics considerations become an integral part of the acquisition process, and receive equal consideration with cost, schedule, and technical performance. The probability and timing of

foreign participation in your program will determine how effectively you can include the foreign government's requirements in your ILS program. If a program is joint from inception, you will be able better to influence the system design to accommodate foreign as well as U.S. ILS requirements, by including their peculiar capabilities, needs, constraints in the MIL-STD-1388 Logistics Support Analysis (LSA) process. The further the program proceeds, without certainty of foreign involvement, the more difficult it will be for the program manager to adjust his system to the peculiarities of the participating country.

The difficulties inherent with late foreign involvement can be eased somewhat by early consideration of potential host nation support during ILS planning. Types of support possible from host nations include but are not limited to maintenance, transportation, materiel handling, munitions maintenance and storage, supply support, engineering support, security, airfields and other facilities, POL supply/storage/distribution, and other services. Early planning for host nation support not only improves opportunities for host nation participation late in a program, but enhances U.S. weapons systems materiel fielding and support, even if allies fail to adopt the system.

Another important theme of this chapter is that the support requirements and capabilities of a foreign country may not match those of the United States, and an integrated logistics support plan (ILSP) must take this into account. The LSA process, which determines and integrates technical logistics requirements, and the Integrated Logistics Support Plan (ILSP), which manages and integrates the development, delivery, and life-cycle support of required logistics resources, must both take this fact into account.

This chapter also contains a description of recent legislation affecting logistics activities, such as the agreements on Host Nation Support, and a current status report on important logistics and training agreements, programs and actions.

PROGRAM MANAGER'S RESPONSIBILITIES

Communication between the United States and a foreign participating country on all areas of ILS is crucial. The program manager must ensure that key logistics personnel for each country are identified and that these personnel participate jointly in planning and establishing the logistics program. The foreign personnel must be familiar with the weapon system and the U.S. personnel must understand the subtleties of the foreign country's logistics requirements, as well as its logistics system. Only then can a well thought-out cooperative LSA and ILSP be formulated.

The difficulty of achieving this cooperation increases the further the program proceeds without foreign participation. If a program is joint from inception, logistics program review teams should be formed as soon as possible. These teams or committees, which are joint operations including members of the participating countries, should be oriented to the specific level deemed necessary. Depending on the complexity of the program, either a two- or three-tier system will normally be used. The lowest or third level is formed of subcommittees or working groups. This level will comprise the functional working level. This may include a group for provisioning, training, computer support, etc. The actual formatting, data requirements,

training, and other integrated logistics support problems will be resolved by these various groups or teams. These level 3 groups will be established by the level 2 committees and meet on an as required basis. Items that cannot be resolved at level 3 will be presented to the level 2 committee. The level 2 committee will act as a steering group for the logistics directives from the level 1 team. In a large program, the level 2 committee will be responsible for most of the communications and the agreements in the logistics arena. This level will meet on an as required basis. Level 1 is the logistics status review team. This team will normally be comprised of the program manager, deputy program manager for logistics, and the designated logistics representatives for foreign countries. Level 1 will review overall logistics policy, establish major milestones, and resolve problems that cannot be resolved at lower levels. This team may meet only three or four times a year, or when deemed necessary, by the program manager.

Whereas the above organization would be appropriate for a program that was joint from inception, and involved joint financial contributions, a different structure is called for when foreign countries are potential participants, but have not funded the program as of this date. Again, the key factor for success is an early involvement and communication between key personnel from both the United States and the potential participants. It is still advisable to establish subcommittees or working groups for each ILS element or functional grouping. Normally, foreign involvement will be more limited to an advisory basis.

If, however, the participating country has become a participant at a later stage in the acquisition, much more assistance is required from the United States. It is still, however, the program manager's responsibility to ensure that each participating foreign country be involved fully in the development of an effective LSA and ILSP, including any country-peculiar annexes that may be required to facilitate mutual support and assistance. If the foreign country has been actively involved in the acquisition process, has participated in logistics committees at all levels, and has a fairly sophisticated logistics system of its own, most of the hard work has already been completed.

There are differences between countries in practically every aspect of support. These differences occur in organizational structure, type of support available at each level, occupational skills, training, facilities, test equipment, and support environments. Because each country understands its own system and own infrastructure better than any other, it is appropriate that it play a vital role in reconciling the systems support requirements with its own support capabilities.

Just as a foreign country may acquire hardware by direct sale, coproduction or foreign material sales (FMS), it can acquire logistics support in the same way. The same elements of planning are required in all three acquisition methods. In planning for foreign participation early in a program, consideration should be given to reliability, amount of non-standard support, and materiel lead times. To accomplish this, the first need is for knowledge of the foreign support environment; this relates to the "Use Study" task in MIL-STD-1388.

In addition, it is important to involve organizations such as the NATO Maintenance and Supply Agency (NAMSA) as early as possible in support for weapon system procurements involving NATO countries. Established in 1958, NAMSA supplies parts and logistic support for a number of jointly-used weapon systems or equipments, especially missiles and electronic systems. All NATO countries except Iceland are members. It is located in Luxembourg.

In joint or multinational developments involving NATO members, the program manager should establish liaison with the Military Agency for Standardization (MAS), NATO to tap the considerable logistical expertise available to that body in its Service Board sub-committees and working parties. Review of such things as organizational and operational concepts for logistics and logistical support studies can facilitate interoperability of the developmental system with logistic systems of participating and non-participating nations. Initial contact can be established through the U.S. representative to the Army, Navy, or Air Boards of MAS (as applicable).

SUPPORT REQUIREMENTS AND CAPABILITIES DETERMINATION

The most appropriate method for establishing support requirements and support capabilities of a foreign country will be determined to a large extent by what has preceded this stage. The two most common methods are the ILS planning conference and the in-country survey.

ILS Planning Conference

The purpose of the Program Planning Conference is to assess the foreign country's ability to introduce and support the weapon system and gather the data needed to prepare an effective ILSP. The ILS Planning Conference may be conducted instead of an in-country survey if it is not feasible to conduct a survey. The decision to convene a Program Planning Conference instead of conducting an in-country survey will be influenced by several factors:

- attitude of the foreign country; some countries do not want a U.S. team evaluating their capabilities
- technological and logistical competence of the foreign country
- experience of the foreign country in introducing similar weapon systems
- availability of sufficient data without a survey

The program manager must decide if an ILS Planning Conference will supply adequate information to formulate a joint ILSP. If it is doubtful that a conference would be adequate, then an in-country survey must be recommended. The inadequacy of a conference may not be apparent until it is in session. In that event, arrangements must be made to obtain the necessary information or to survey the appropriate sites.

An ILS Planning Conference should be conducted as soon as possible after foreign participation is reasonably certain. This will enable the PM rapidly to gather sound and agreed-upon data upon which to base the ILSP and

to tailor the LSA Host. The U.S. attendees at the conference should be representatives of the offices, agencies and activities who will be responsible for planning and reviewing the LSA, and implementing and supporting the ILSP. Since there will be no in-country survey and functional analysis, it will probably be feasible to combine logistics elements assignments and reduce the number of conferees below the levels required for a comparable in-country survey. The foreign country should be encouraged to send both technical and supply personnel. Contractor representatives should be invited as required.

The conferees should be assigned to functional working groups to correspond to the major program elements, both logistics and management, and a group leader should be designated for each group. Under the group leader's direction, each group should be assigned the responsibility for preparing the corresponding sections of the ILSP: technical data, computer resources, packaging, handling, storage and transportation, support equipment, manpower, and facilities.

The agenda for a Program Planning Conference will be similar to that for an in-country survey (see below), except that discussions and presentations will be substituted for visits to sites. Every facet of an ILSP should be considered, even though the completed plan will not necessarily contain a detailed functional analysis. The conference should evaluate the adequacy of provisions for logistic support of the system both by the U.S. and the foreign country. This includes evaluation of the maintenance plan, training requirements, configuration management, supply, follow-on supporting cases, and presentation of the management plan for implementing and administering the ILS.

In-Country Survey

Purpose. The in-country survey is conducted by representatives of the foreign country and a team of U.S. personnel, including contractors' representatives. The purposes of the survey are to:

- identify the country's support requirements for the weapon system it is acquiring
- assess the country's support capabilities
- prepare a plan for reconciling support capabilities with support requirements

A survey is one part of the LSA process and is required whenever U.S. planners have insufficient information about the country's support requirements and capabilities to prepare an adequate support plan. Surveys should be conducted for most major systems.

Preparation. A successful in-country survey results from careful planning and preparation. If a preliminary support plan has already been prepared, it will contain most of the available information. Remember that the basic purpose of the in-country survey is to obtain information. The more accurately information needs can be identified beforehand, the more efficient and effective the team's activities will be.

The composition of the team should be tailored to the specific objectives of the survey. Team members must be experts in their fields, self-starters who can work without direct supervision, and, if possible, experienced in dealing with foreign allies. The importance of an in-country survey and its cost militate against selecting a team by any criterion other than competence.

The size of the team depends on the scope of the survey. Reports from previous surveys may help in deciding the size and composition of a team.

Organize the team into groups, based on the functional areas to be addressed in the survey. These include:

- Functional analysis and logistics
- Facilities
- Supply/provisioning and FMS interface
- Support equipment (GSE/SSE)
- Training and training equipment
- Publications, technical data, and documentation

Appoint an executive committee, consisting of the team leader, the group leaders, and other senior personnel. The executive committee should advise the team leader, assist in coordinating the survey effort, and edit and review the survey report.

Before leaving the U.S., get the team together. Prepare an in-country survey agenda. Make sure the members understand the objectives of the survey and their roles and responsibilities. Pay particular attention to review of the following:

- Configuration. The team must know the foreign country's system configuration, how it differs from the U.S. configuration, and the support requirements peculiar to the foreign configuration.
- Security Implications. Identify any information, data, or support which is not releasable to the foreign country. This will affect the team members' discussions with their foreign counterparts, as well as the logistic support and training which can be recommended.

Both the survey team and its foreign counterparts will need sufficient technical and non-technical reference material during the in-country survey. Early in the preparations for the survey, identify all needed documentation, determine what is already available in-country, and pre-ship the remainder so it is available for the survey team upon its arrival. Most will be given to the foreign country upon completion of the survey. The types of documentation required are listed below:

- Production and engineering data

- Prints and drawings
- Documentation of standards
- Specifications
- Technical manuals
- Changes and modification data
- Inspection and testing procedures
- Performance and failure data
- Spare parts listings and Illustrated Parts Breakdown (IPB)
- Technical repair standards
- Other forms of technical or logistics data and information originated by contractors or other Government Agencies or Military Departments which may be required for maintenance, logistics, or provisioning review

The MAAG is the day-by-day interface with the foreign country's military organizations. Not only must it be kept informed of the status of the program and the plans of the survey team, but it should be able to provide valuable information and assistance to the team.

Conducting the Survey. The functional analysis is an in-depth survey of the foreign country's ability to perform maintenance corresponding to the levels used by the U.S. Service. It is subdivided to correspond to the subsystems of weapons or weapon systems, for example, airframes, ships' weapons and fire control, and rocket motors. The functional analysis also includes an examination of the procedures for performing maintenance currently in use by the foreign country in relation to U.S. practices. Foreign countries' division of maintenance tasks may not correspond to the levels prescribed by the U.S. Service. One purpose of the analysis is to identify and evaluate any differences and recommend either changes to the foreign maintenance structure or redistribution of U.S. maintenance procedures to correspond to the foreign structure.

The functional analysis becomes a synopsis of maintenance capability at all U.S. Service maintenance levels, including work methods and manning. Include in the functional analysis the unique maintenance requirements resulting from acquisition of the new system. Include brief functional descriptions of subsystems with the unique maintenance requirements. The functional analysis normally constitutes a major subsection of the ILSP. REMEMBER, THE SURVEY SHOULD PROVIDE THE FOREIGN COUNTRY PERTINENT INFORMATION WHICH IS USABLE AFTER THE TEAM HAS DEPARTED.

Each section of the functional analysis should conclude with concise recommendations.

Functional Analysis

Facilities. The survey of facilities determines the adequacy of structures, property, and permanently installed support equipment to support the planned weapon system. The survey of facilities should be a more detailed definition of requirements identified during the functional analysis. It must include an examination of the facility's functional utility, covering for example, shop layout, work flow, installed handling equipment, servicing, personnel facilities, environmental controls, and facilities maintenance.

The personnel conducting this survey must be knowledgeable in basic facilities requirements and the technical and operational requirements of the weapon system.

Supply System. The survey of the foreign country's supply system is designed to accomplish two objectives:

- to understand how the supply system is organized and how it functions

- to generate recommendations for changes or for methods of accommodating the supply support requirements resulting from acquisition of the new system

The major operations surveyed should include, but not necessarily be limited to:

- Stock replenishment, storage and issue

- Repairable material handling

- Financial management

- Supply personnel acquisition and training

The foreign country's plans for supply support of the weapon system should be thoroughly reviewed.

Repair of Repairables. The survey should consider the foreign country's capability and intentions regarding the repair of repairables -- items of durable nature which, when unserviceable, normally can be economically restored to a serviceable condition through regular repair procedures. Repairables, as defined here, do not include explosives or cryptographic equipment. Repair of repairables may be accomplished by:

- the foreign country, through organic capability or in-country or third country civilian capability, or

- return to U.S. facilities for repair or replacement

If the foreign country intends to use in-country repair facilities, the survey should evaluate their capability and submit recommendations to correct deficiencies. If the foreign country intends to use third country facilities, releasability and security implications must be considered.

Training. Training requirements will depend on the results from all areas of the in-country survey. For every deficiency in capability to support the weapon system, an evaluation of the training impact must be made. Personnel responsible for preparing the training evaluation must work closely with all other members of the survey team.

U.S. training requirements for the weapons system, if established, provide a baseline for foreign requirements. However, the U.S. training requirements may require modification to be adoptable. Some of the factors to be considered initially are English language ability, level of core technical training, occupational structure of the foreign service, and level of operational proficiency.

Once an initial determination of training requirements is made, additional factors must be considered. These will be discussed in greater detail in the training section.

Contractor Engineering and Technical Services (CETS) and Contractor Maintenance Services (CMS). CETS and CMS may be required by the foreign country at any or all maintenance levels, particularly during the introduction, check-out, or transition phase. CETS and CMS programs provide personnel who can conduct maintenance, on-the-job training, and troubleshooting assistance and can provide liaison between equipment manufacturers and foreign maintenance personnel.

The requirement for CETS and CMS must be determined by an evaluation of the projected progress of maintenance training programs. The length of the requirement will depend on the time it takes the foreign country to attain full operational and maintenance capability.

Technical Data, Publications, and Documentation. This part of the survey establishes requirements for updating the country's technical data, publications, and documentation library to support the weapon system. If the survey team's preliminary planning has been thorough, the task can be accomplished by comparing the analysis of required documentation to the foreign country's inventory. An inventory of the policy directives and instructions should be conducted to ensure that the country has sufficient information to interface with the U.S. Service in all facets of support.

Procedures for continued updating of documentation should be discussed and agreed upon, including recommendation for an FMS case to ensure the receipt of changes and revisions not provided for by other means.

Personnel. The introduction of a new weapon system into a foreign inventory may change manpower requirements. Evaluation of the manning requirements is done during the functional analysis and the survey of other logistics areas. The evaluation includes identification of required skills.

Configuration Management. The ability to perform configuration management should be assessed to ensure adequate control of the evaluation, coordination, approval, disapproval, or implementation of:

- the initial configuration

- changes from the initial configuration after formal baselines are established, particularly alteration, modification or retrofit.

The basic elements contained below must be considered:

- formal scheduling of engineering change proposals (ECPs)
- design change reviews
- processing, evaluation, approval, or disapproval of ECPs
- implementation of the changes

Reporting In-Country Survey Results. The results and recommendations of an in-country survey should be reported by functional area. When practical, the report should be completed, mutually agreed upon by the foreign representatives and the survey team leader, and presented to the foreign government prior to departure of the survey team. The results of the survey will become a permanent part of the ILSP and will serve as the foundation of the Program Milestone Plan for implementation of the case.

FUNCTIONAL AREAS

The program manager should now have adequate information on the foreign countries' capabilities to allow him to formulate an effective ILSP for each country. Of course, this will be accomplished on a cooperative basis between U.S. and foreign personnel. There are many functional areas that require tailoring to match foreign capabilities with system support requirements. Three selected areas: maintenance concepts, training, and supply strategies, are covered in this chapter in an attempt to shed some light on the unique problems each represents.

Maintenance Concept

Elements of a Maintenance Concept. The maintenance concept, together with the operating plan and weapon system configuration, forms the foundation for logistic planning. It sets out, in general terms, who performs what maintenance actions, on which items, where, when, and sometimes how.

Normally, the concept is described in terms of levels, or echelons, of maintenance and the responsibilities of each. For example, a description of a U.S. Navy maintenance concept would identify the types of maintenance performed by each of the three standard U.S. Navy levels of maintenance -- organizational, intermediate, and depot -- and the role, if any, of contractor support. The maintenance capability required at each level depends on how the weapon system is designed, how it is employed, and how maintenance responsibilities are allocated. The maintenance capability actually established at each level is manifest in the skills, facilities, tools, support equipment, and other logistic resources provided at that level.

Differences Between U.S. and Foreign Maintenance Concepts. Many foreign countries who use U.S. designed systems and equipments try to adopt the

U.S. approach to maintenance. Yet few foreign systems and equipments are supported exactly as they are in the U.S. Even when a foreign country says it is following the U.S. maintenance concept, close scrutiny often reveals fundamental differences that significantly affect logistic requirements. This section discusses some reasons why the U.S. maintenance concept for a system or equipment may need to be modified to suit the needs and capabilities of a foreign country.

Mission. The U.S. Armed Services, because of time and distance factors associated with operations in forward deployed areas, normally try to make using units as self-sustaining as possible. The result is to push maintenance capability to the lowest level possible.

The missions of many foreign services do not usually require distant deployments. Thus, for ships, it is not unusual for a foreign navy to accept a lower level of on-board maintenance capability and rely more on shore facilities for maintenance.

Numbers of Weapon Systems. Most foreign acquisitions are for comparatively small numbers of systems or equipments. It may be unnecessary, impractical, uneconomical, or even impossible for an ally to implement in its entirety a U.S. maintenance concept which is designed to suport the U.S. forces. For example, the maintenance concept for a U.S. inventory of several hundred aircraft may not suit the needs of a country which must support only a dozen or two.

Organization Structures for Maintenance. The functions performed by each of the U.S. Navy's and Air Force's standard three levels of maintenance, and the Army's four levels, are frequently allocated differently among the various levels of a foreign country's maintenance structure. As few as two or as many as five levels may be delineated. For example, at an aircraft operating base, there may be little distinction between organizational and intermediate maintenance, both being accomplished by one organization. At the other extreme, the functions assigned in the U.S. Air Force or Navy to intermediate and depot levels may be split among three or four levels, reflecting a division of responsibility among military units, military-controlled industrial facilities, government-controlled industrial facilities, and private industry (local, U.S., or third country).

Relationships Between the Military and Industry. In many countries, the shipbuilding, aircraft, and other defense industries are either nationalized or partly owned by the government. Even when the government takes no ownership or management role, some privately owned companies may represent the only national industrial capability in their fields. Hence, foreign industry is likely to be given more responsibility for system maintenance than its U.S. couunterpart. For example, in some foreign countries, private or nationalized companies may supply the same services provided the U.S. Navy by Naval Air Rework Facilities and Naval Shipyards, and there may be no comparable military-owned capability.

There may also be no national capability for certain types of maintenance, for example, calibration of test equipment, repair of inertial navigation systems, and overhaul of certain components. Such maintenance may be

done by the U.S. Armed Service, U.S. industry, or third countries. Or, several countries having the same types of equipment may cooperate to establish a regional industrial activity or to divide depot maintenance functions among them. Whatever alternative is used, government-to-government relationships and industry-to-government relationships in each country become critical to establishing effective arrangements for maintaining military systems. It is important that the maintenance concept for these systems and equipment reflect such arrangements.

Manpower Structure of the Armed Forces. Implicit in a U.S. maintenance concept are the traditional roles and functions of the various manpower categories: officers, warrant officers, enlisted personnel, and civilians. Every foreign country, too, has its own traditions, culture, and sometimes laws, governing the types of tasks performed by its workforce and how they are performed. To be effective, the maintenance concept must take these differences into account. For example, maintenance tasks requiring English language training and technical training in the U.S. will not be assigned to an organizational level manned by conscripts who may be serving 13-18 month tours. Nor will maintenance tasks be assigned to personnel who traditionally have been responsible only for system operation, as have the ships' crews in some navies. If only civilians traditionally have performed, or are capable of performing, certain tasks, the maintenance concept will be tailored to assign those tasks to maintenance levels manned by civilians.

Resource Allocation Priorities or Limitations. Our allies may not want to allocate their resources, or may not have the resources, either technically trained manpower or money, to support their systems the same as the U.S. Nor do their operations always require the same support. Consequently, their decisions about allocation of maintenance functions are frequently motivated by priorities and limitations markedly different from those that shaped the U.S. maintenance concept. Such considerations are most likely to affect decisions on support investments -- such items as facilities and support equipment which may be essential to full implementation of the U.S. maintenance concept.

Tailoring a Maintenance Concept. If the U.S. maintenance concept is inappropriate for a foreign ally, it will have to be realigned before logistic planning can proceed. One approach to identifying the needed modifications is to make comparative outlines of the maintenance structures. First, outline the general characteristics of the U.S. maintenance concept, identifying for each level of maintenance, the major types of maintenance action, locations, facilities, test equipment, and skills. Next to it, outline the foreign country's standard maintenance structure, identifying the locations, types of maintenance action, facilities, test equipment, and skills normally associated with each level. After comparing equipment configurations, numbers of systems, and operating plans, roughly map the U.S. maintenance concept onto the foreign maintenance structure. Then flesh out the skeleton by fully specifying the locations, maintenance responsibilities and logistic resource requirements of each level of the foreign country's maintenance structure. Check for full coverage of all elements of integrated logistic support. For each element, decide how the realignment of maintenance concept affects the

requirement and distribution of logistic assets. Do not overlook the effects on logistic needs of the following:

- system configuration
- numbers of systems supported
- operating cycles
- distances between supporting and supported units
- Lead times required for supply and maintenance support

Be especially alert for depot-level maintenance capabilities which cannot be economically upgraded to meet requirements, and seek alternative ways for providing those capabilities (for example, U.S. Service, U.S. industry, regional agreements, or a third country industry or government).

Training

Introduction. Training of foreign personnel, both military and civilian, is an essential part of the Military Security Assistance Program. Security assistance training is comprised of International Military Education and Training and FMS training. There are currently in excess of 12,000 training quotas being used by foreign personnel in U.S. Navy training activities alone. In addition, there are numerous foreign military personnel being trained by contract personnel and training teams under the auspices of the Security Assistance Program. Training implications are present in the majority of foreign acquisitions, and the interpersonal relationships which exist during the conduct of training have far reaching effects on the rapport between the U.S. and foreign armed forces. That is only one of the objectives of the Security Assistance Training Program which are:

- To create skills needed for effective operation and maintenance of equipment acquired from the U.S. through the Military Assistance Program (MAP) or Foreign Military Sales (FMS).
- To assist the foreign country in developing expertise needed for effective management and operation of its defense establishment or an element thereof.
- To foster development by the foreign country of its own indigenous training capacity.
- To promote U.S. military rapport with the Armed Forces of the foreign country.
- To promote the foreign policy, security and general welfare of the United States by assisting persons of various countries in their efforts toward economic development and their internal and external security.
- To promote better understanding of the United States, including its people, political system, and other institutions.

Determining Training Requirements. The first step in determining training requirements is to assess the foreign country's capability to operate and maintain the weapon system. With technically sophisticated and experienced countries, this may be accomplished by providing the country with operating, technical and maintenance requirements data and allowing them to evaluate their own capability. In other instances, discussions and conferences might suffice. For the least capable countries, or for the first time introduction of advanced technology systems, an in-country survey is required. In any event, the U.S. technical and training communities and the force mission sponsors must participate in the determination of training requirements, particularly when operational training implications are anticipated.

The determination of training requirements is not limited to the foreign country's armed forces, but must include also its industrial sector. In addition to maintenance training requirements, installation and check-out training must be addressed if the acquisition involves installation of new equipments or in-country construction programs. Consideration must also be given to post-delivery training requirements.

Fulfilling Training Requirements. Foreign countries usually want their personnel training in U.S. schools whenever possible. However, because of resource constraints, U.S. schoolhouse training is not always available. The determination of the availability of U.S. training will be made by the appropriate authorities in each Service. If there are shortfalls in U.S. capability or if the required training curricula have not yet been developed, alternatives must be pursued.

In-Country Training. If the customer country is capable, it may be advantageous to encourage it to establish its own in-country training utilizing Field Training Services (FTS). FTS consists of two types of training services:

- DoD Engineering and Technical Service Specialists (ETSS) who can be funded under FMS by an LOA and who are DoD military or civilian personnel technically qualified to provide advice, instruction and training in the installation, operation and maintenance of weapons, equipment and systems. ETSS are normally made available for up to one year, but may be longer if specifically approved by DSAA.

- Contract Field Services Personnel (CFSP) who are provided under contract with private industry and perform the same functions as ETSS, provided skilled personnel are not available from DoD.

Contractor Training. The use of contractor training, either in the U.S. or in-country, is a viable alternative to U.S. Armed Forces training. It may be the only method initially to train foreign industrial workers. The training may be done at the contractor's facility or, as has occurred, by contractors at a U.S. installation. Contractor training may be the only method of training on new equipments, such as introduction of new aircraft, for which only the contractor has sufficient qualified instructor personnel. Contractor plant training is also applicable to training foreign industrial personnel under a licensing agreement. This has been done under licensing agreements for overseas manufacture of aircraft jet engines.

Contractors may be engaged to conduct training in-country. This method of training may utilize the original equipment manufacturer, or it may utilize contractors engaged solely to provide training in both operations and maintenance. Contractor training may be a part of an acquisition contract, or it may be the subject of a separate contract.

Third Country Training. Third countries may be utilized to provide training to the foreign country's personnel. While this is normally arranged between the countries involved, it should be included in the overall addressal and programming of training to reflect its contribution in meeting training requirements.

Training Conference. A Training Conference, if required, is convened to validate requirements and to allocate U.S. resources to fulfill them. The attendees are Service representatives of the appropriate activities. If requirements cannot be met, alternatives must be utilized. The Training Plan resulting from the training conference is a specific milestone plan for the accomplishment of training and the basis for an LOA for T-case (an FMS for training).

Foreign Military Sales

Initial Provisioning. Provisioning is defined in DoD Directive 4140.40 as a "management process for determining and acquiring the range and quantity of support items necessary to operate and maintain an end item of material for an initial period of service." The provisioning cycle starts with award of a production contract and continues through item shipment by manufacturers and suppliers.

An initial provisioning conference is normally conducted at the contractor's plant as a joint U.S./customer country/contractor effort. Its purpose is to help the customer make maintenance and support decisions according to his established maintenance concept. Provisioning is influenced by many factors, such as design, maintenance planning, supply requirements determination, item entry control, procurement, cataloging, and contract administration. Good configuration management is essential to the provisioning process because of the effect of design changes on items previously or currently provisioned. The result is a selection of the range and depth of initial support.

During the provisioning process, the acquisition manager provides the following:

- performance data (MTBF, operating hours)
- maintenance concept
- installation schedules

The contractor provides provisioning technical documentation (PTD) which consists of:

- parts lists

- drawings

- failure rate/repair level analysis

- technical manuals

These inputs are merged during the provisioning planning conference and culminate in the provisioning decision conference.

Follow-On Supply Support. Follow-on supply support is normally provided through three types of cases: (1) defined order, (2) blanket order, and (3) Cooperative Logistic Supply Support Arrangement (CLSSA).

Defined order cases, also known as firm order cases, are for a definitive list of items. They are specific one-time sales contracts and normally require a price and availability (P&A) estimate.

Blanket order cases are also known as blanket open-end cases, direct requisitioning procedure (DRP) cases, open-end requisitioning cases and pull cases. They may also be called an annual case or annual buy. The cases, are for a specific dollar value, and the items or quantities are not specified. The Military Standard Requisitioning and Issue Procedures (MILSTRIP) process is used for requisitioning by the customer country.

Under a CLSSA, the U.S. Government purchases, stores, manages, and issues spare parts to the foreign customer using the U.S. logistics system. The intent of a CLSSA is to provide the customer peacetime support similar to that given U.S. forces having the same priority. Some of the advantages of a CLSSA to the U.S. and the foreign government are:

- Reduced costs through higher volume procurement

- Increased accuracy in projection of requirements

- Increased equipment standardization

CLSSAs are implemented through Foreign Military Sales Orders (FMSOs). There are two kinds of FMSOs, FMSO I and FMSO II.

A FMSO I case defines the value of stocks to be maintained in the DoD inventory for the country. Items involved are classified as recoverable spares, consumable spares, and Defense Logistics Agency-managed consumable spares. This type of case also results in an obligation for the customer country of normally 17 months' demand value of the material. Upon acceptance of the case by the U.S. Service, the country must pay only the first 5 months' estimated demand, plus storage and operating inventory loss and administrative charges, based on the 5 months' demand value.

A FMSO II case is established on an annual basis to permit the country to draw spares and repair parts from U.S. Service stocks as in-country stocks are consumed. This type of case is defined only in terms of a dollar value and does not define either items or quantities. The country is authorized to submit requisitions for all spares and repair parts required for

support of the approved programmed requirements under the CLSSA. This includes authority to requisition items not on the stock level case (FMSO I), which will be supported as nonprogrammed requirements. The priority of the individual requisitions is assigned by the country, based on the force activity designator (FAD) and urgency of need designator (UND) approved by the U.S. Joint Chiefs of Staff. The requisition case is normally valid for the input of new requisitions for one year, at which time the replacement case must be established. The requisition case remains open for management purposes until all items requisitioned have been shipped, billed, and paid. This case is also used to recover the storage costs for the items on hand in the FMSO I case.

Direct Sales (Commercial Sales). FMS is not the only way a foreign country may acquire supply support. Military equipment may be sold directly to the customer countries by U.S. suppliers. In fact, the only statutory limitation on commercial sales is that major defense equipment over $100 million cannot be sold to purchasers other than NATO countries/international organizations, Japan, Australia, and New Zealand by direct commercial sale.

Authority for direct commercial sales is contained in Title 22 USC Sec. 2778. Commercial sales are direct transactions between U.S. suppliers and foreign countries; they are not administered by DoD and do not involve credit under the provisions of the Arms Export Control Act. The U.S. Government maintains control of the sales by requiring suppliers to apply for export licenses from the State Department. Reimbursements and negotiations are conducted directly between the country and contractor.

Many direct commercial sales are consummated without DoD involvement, except for coordinating approval of the export license through the Office of Munitions Control, Department of State. The purchaser usually does not contact any element of DoD before transacting a direct commercial sale through the U.S. contractor. However, there can be some DoD involvement. For example, if the purchaser has a loan program established, it can be used for purchases through either FMS or direct commercial sources. Therefore, coordination by the purchaser with DSAA to establish the loan program for a particular sale (including direct commercial sales) before it is consummated is a necessity.

Only riot control agents must be sold through direct commercial sale procedures; such agents cannot be provided via FMS (Military Assistance Sales Manual (MASM), Part I, Chapter C, paragraph 9). Otherwise, items are normally considered candidates for direct commercial sale in lieu of FMS when they "are not directly related to a requirement for support or maintenance of military equipment." Examples include: agricultural machinery and equipment; plumbing, heating, and sanitary equipment; construction and building materials; chemicals and chemical products; tires; textiles; clothing; and furniture.

Exclusive Licensing Agreement. An exclusive licensing agreement gives the right to sell U.S. equipment in foreign countries to a foreign firm. Such agreements are not directly managed by DoD but involve other U.S. Government agencies, such as the Departments of State and Commerce.

In general, when an exclusive licensing agreement is in effect, it should be honored, and any FMS requests for those items from countries listed

in the agreement should be returned with a reference to the agreement and the advice to make the purchase commercially. However, if the purchaser insists on an FMS transaction, the following actions are necessary (see MASM, Part III, Chapter H, paragraph 7):

1. The request should be set forth by the Minister of Defense/ Deputy Minister of Defense or equivalent, outlining the reasons for desiring an FMS purchase rather than a commercial one from the foreign licensee.

2. The Director, DSAA, will notify the foreign firm concerned, in writing, of receipt of the request with a copy attached (if unclassified).

3. The foreign firm will be given an opportunity to provide data pertinent to the request, including a statement as to the amount of financial return to the U.S. economy should such a sale be made by the foreign firm.

4. If P&A data or an LOA (DD Form 1513) is to be issued, the Director, DSAA, will advise the foreign firm. In addition, the firm will provide upon request all relevant unclassified and nonproprietary P&A data. The foreign firm shall be advised of all renewals, modifications or extension of such DD Form 1513 prior to acceptance by the purchasing country.

Coproduction. Coproduction is a method whereby product manufacture and assembly are shared between the U.S. and foreign producers. A coproduction project may be utilized to provide supply support under FMS procedures.

A coproduction project may be limited to the assembly of a few end-items with a small input of local country parts, or it may extend to a major manufacturing effort requiring the build-up of capital industries. Coproduction is a program under the auspices of the U.S. Government, governed by diplomatic or DoD agreement, and administered either directly through the FMS program or indirectly through specific licensing arrangements by designated commercial firms. Coproduction enables an eligible foreign government, international organization, or designated foreign commercial producer to acquire the know-how to manufacture or assemble, repair, maintain and operate, in whole or in part, a specific weapon, communciations or support system, or an individual military item.

The term coproduction includes any program wherein the U.S. Government through either diplomatic agreement or an agreement between a Ministry of Defense and DoD: (1) enables an eligible foreign government, international organization, or designated commercial producer to acquire the technical information and know-how to manufacture or assemble in whole or in part an item of U.S. defense equipment for use in the defense inventory of the foreign government; or (2) acquires from a foreign government, international organization, or foreign commercial firm the technical information to manufacture domestically a foreign weapon system for use by the U.S. Department of Defense.

Coproduction includes: government-to-government license production arrangements.

Coproduction does not include: (1) overseas licensed production based on direct commercial arrangements with U.S. export licensing, or (2) the provision of technical data for the purpose of providing information for maintenance, repair, overhaul of operation of a defense item, without permission to manufacture the item or its components. (Source: USDRE)

Third Country Procurement. There are other sources from which a foreign country can acquire supply support: third country sales, reciprocal trade agreements, and through collective defense treaty organizations like NATO, utilizing NATO rationalization, standardization, and interoperability standards.

In-House Production. In-house production is an alternative to FMS that the customer country may pursue to contribute to its economy, possibly shorten lead times, and/or develop a degree of self-sufficiency. However, in-house production itself may require support of an FMS case. For example, training, engineering drawings and associated lists, and technical support may have to be supplied to the customer country.

RECENT LEGISLATION

Two recent legislative actions of Congress are worthy of description in this chapter. They are the NATO Mutual Support Act of 1979, dealing with host nation support, and the International Security and Development Cooperation Act of 1980, which deals with logistics support of other countries in the event of hostilities there.

NATO Mutual Support Act of 1979

The NATO Mutual Support Act of 1979 (P.L. 96-323) authorizes the Secretary of Defense to enter into certain agreements with NATO countries and subsidiary bodies for the acquisition or reciprocal provision of logistic support, supplies and services between U.S. Forces and NATO military forces deployed in Europe and adjacent waters. The Act (1) authorizes waiver of certain provisions of the law relating to the acquisition and transfer of logistics support; (2) establishes reciprocal pricing and reimbursement procedures for the acquisition and transfer of logistics support as required by certain host nation support and cross-servicing agreements; (3) sets a dollar ceiling of $100 million ($25 million only for acquisition, excluding POL) on obligations and accruals in any fiscal year; (4) prohibits increase in inventories for purposes of using authority of the Act.

The statutes that may be waived by this Act are:

(a) 10 USC 2304 (g) pertaining to competition in negotiated contracts;

(b) 10 USC 2306 (a) pertaining to cost-plus-percentage-of-cost contracts;

(c) 10 USC 2306 (f) pertaining to cost and pricing data;

(d) 10 USC 2313 pertaining to audit of DoD and Comptroller General;

(e) 50 USC App. 2168 pertaining to cost accounting standards.

The enactment of this Act should simplify U.S. procedures both for obtaining and providing logistic support in the field during joint exercises and operations with our forces in the NATO Alliance. The NATO Mutual Support Act has been implemented by DoD Directive 2010.9 "Mutual Logistics Support Between the U.S. and Other NATO Forces," and DoD Instruction 2010.10 "Mutual Logistics Support Between the U.S. and Other NATO Forces - Financial Policy."

International Security and Development Cooperation Act of 1980 (Public Law 96-533)

This new law contains a provision of relevance to logistics support of other countries in the event of hostilities there. PL 96-533 amends Section 21(c), AECA, to prohibit the sale of defense services involving training and advising that may engage U.S. personnel in combat activities. (Existing Section 21(c) prohibits the sale of defense services involving training, advising, or otherwise providing assistance regarding combat activities.) The amendment also provides for a Presidential report 48 hours after the outbreak of hostilities in countries where U.S. personnel are performing defense services. Per the Conference Report, the following report language in the House bill, which established the guidelines with respect to activities permitted and prohibited under Section 21(c), will be used to implement the Conference Committee's substituted language:

Activities Permitted	Activities Barred
Continue to help organize and train ground force units, including training for combat, in support areas.	No trainers, advisers, or other personnel with units engaged in combat.
Continue to help organze and train Air Force units, including training for combat; continue to help repair and maintain combat equipment; assist in operation and maintenance of airfield facilities, such as hydrant refueling systems and munitions storage and repair facilities.	No flight line activities with combat units, such as arming or fueling aircraft for combat sorties.
Continue to help organize and operate vehicle repair and maintenance activities in support areas.	No personnel with or delivering equipment to units engaged in combat.
Continue to help train personnel in use of highly technical equipment in support areas.	No personnel with units engaged in combat.

Continue to provide advice on military strategy and doctrine at headquarters above unit level.	No personnel with units engaged in combat.

NATO LOGISTICS ACTIVITIES

Since so much of DoD RSI planning and implementation is focused on NATO because of its defense importance and priority, it is appropriate to include in this guide a discussion of recent NATO logistics actions indicating the major initiatives being taken by the U.S. and its allies. This section covers a range of such activities including host nation support, harmonizing logistics arrangements in the Communication Zone (COMMZ), logistics organization, interoperability, the NATO Logistics Master Planning System, and NATO infrastructure. Much of the detail provided in this section has been drawn from the Secretary of Defense's Seventh Report to Congress on Rationalization/ Standardization Within NATO, January, 1981.

Host Nation Support in NATO

In addition to the passage in 1980 of the aforementioned P.L. 96-323, which authorizes the Secretary of Defense to enter into host nation support (HNS) agreements with NATO countries, a number of HNS agreements were concluded in the same year.

The general rationale for such agreements is that U.S. forces currently allocated to Europe need additional logistics support to conduct sustained operations of the intensity envisioned in that theater. With the increased prospect of deploying major U.S. ground and air forces to Southwest Asia, where logistics demands would be greater and reasonably assured levels would be far less, there could be even fewer support forces available in Europe. Consequently, the need for HNS in Europe is increased.

HNS requirements fall roughly into the following functional categories: decontamination, engineering support, maintenance, materials handling, medical, personnel, POW handling, security, services, transportation, wartime stationing, airfield damage repair, airbase security, facilities, transportation and vehicle support. In recent discussions with Germany, BENELUX countries and the U.K., these countries have been asked to increase their wartime HNS support to U.S. lines of communication (LOC), collocated operating bases (COBs) and - in the case of Germany - to forward deployed U.S. forces.

Host nation support of the LOCs includes support of U.S. reinforcements and follow-on resupply originating in the CONUS and moving through European seaports and airports to forward locations in Central Europe. Also, many intratheater movements, such as munitions movements from central storage locations to positions of intended use, are included under LOC agreements. The first step in establishing LOCs is the negotiation of umbrella agreements between the U.S. and host governments followed by specific technical agreements to cover HNS for construction, facilities, utilities, transportation, airfields, procurement, civilian labor, communications, marine fleet, and general support.

Bilateral LOC agreements have been signed with Norway, Denmark, U.K., the Netherlands, Belgium, and Luxembourg. LOC agreements with other countries are being negotiated. A wartime movements plan with Germany has also been completed. A project is underway to develop an integrated U.S./ Canadian LOC from the North American continent to optimize the use of transportation resources in peace and war in support of U.S. and Canadian forces in Europe. Technical agreements resulting from this project will augment a U.S./Canadian logistics rationalization agreement implemented in 1978. With respect to collocated operating bases (COBs), the U.S. has identified bases in Europe to support U.S. based augmentation aircraft. Technical arrangements have been completed for the use of many of these bases.

Harmonizing Logistics Arrangements in the Communication Zone (COMMZ)

Harmonization means blending of the logistics policies, procedures, and supplies and services of several nations and improving arrangements and agreements for working together in the COMMZ. The importance of a fully coordinated support plan, using both military and civilian resources to accomplish the forward movement of reinforcements, refugee control, casualty evacuation and other supply, maintenance, and transportation services, has been realized by all nations. A number of actions supporting harmonization in the Communications Zone (COMMZ) on the European continent has been taken which are worthy of reporting in this guide.

Logistics Coordinating Capability at NATO Major Subordinate Commands
One of the major objectives of the LTDP in the area of consumer logistics was the establishment of a logistics coordinating capability at Hq Allied Forces Central Europe (AFCENT). This was completed in 1979 with the formation of the AFCENT Multi-National Coordination Center (MNCC). In peacetime, the MNCC will help plan for the reception and onward movement of external reinforcements and host-nation support requirements. In war and crisis, its functions will include coordinating support and monitoring movements of NATO forces in the Central Region.

Remedial Measures to Resolve Problems Arising from the Discharge of Bulk and Containerized Ammunition Cargoes. Current national restrictions on the use of seaports in Europe for the discharge of ammunition could impede reinforcement during crisis or even war. The Senior Civil Emergency Planning Committee (SCEPC) has established an ad hoc group to address the development of an alliance policy for the civil handling and movement of ammunition. The objective is to obtain agreement among nations and pass all necessary enabling legislation on (1) predesignation of seaport and airport facilities to be used for crisis and wartime ammunition receipt, (2) relaxation in crisis and war of peacetime safety restrictions on the use of seaports, airports, coasters, ferries and the inland waterways (3) unencumbered movement of shipments of ammunition across national borders and (4) commitment of the nations to maximum possible uniformity in procedures and regulations governing communication handling and movement.

Transportation Coordination During Rapid Reinforcement. The SCEPC has been directed to develop arrangements to coordinate the reinforcement movement flow based on a chain of national and international civil and military organizations.

Safe Havens for Battle-Damaged NATO Naval Ships. In a hypothetical engagement at sea between NATO and Soviet naval ships in the North Atlantic, structural, hull, and machinery damage to allied ships can be anticipated. Extended tows to distant allied shipyards or repair facilities would permit further damage to the towed units. The U.S. is promulgating plans for the development and establishment of safe havens to be located relatively close to the battle areas but within the umbrella of allied air cover.

Cooperative Military Airlift Arrangements. To provide important reciprocal airlift support between NATO allies, DoD submitted legislative proposal 96-42 which would authorize the Secretary of Defense to enter into bilateral or multilateral arrangements with allied governments and NATO Headquarters for reciprocal air transport of military personnel and cargo. Transportation would be provided on a space available basis so that scheduled airlift flights of any participating country would not be increased solely to accomodate requirements of another country. Thus, these arrangements would not result in additional costs for the U.S. or its allies and would improve the use of airlift assets during military exercises.

Mutual Use of Petroleum Terminals. Three petroleum tank farms have recently come under the U.S./German support agreement. The agreement provides for peacetime issue to U.S. forces of POL stocks from the three German terminals located near U.S. operating areas. Negotiations are continuing for the possible extension of the arrangement to include wartime situations. In the U.K., the U.S. Navy has contracted with the Royal Navy for fuel storage and is in process of finalizing storage agreements. The agreements provide for storage and issue of U.S.-owned stocks during peace and war.

Depot Maintenance of Equipment. USAREUR and German Army bilateral planning for the cross-service of combat vehicle depot-level maintenance has continued to the extent that workloads and readiness considerations warrant. The host nation supported depot-level maintenance program initiated in prior years has continued. This program also provides for HNS of U.S. forces direct support (DS) and general support (GS) level maintenance requirements after M-day.

Regional Purchase of European Non-Tactical Vehicles. The purpose of this program is to purchase low-density, non-tactical administrative use vehicles from European manufacturers for use in theater by U.S. forces. This program has two primary objectives. The first is support of NATO standardization objectives. Use of European vehicles simplifies logistics support because the forces of several NATO countries are using the same vehicles, and spare parts and maintenance are readily available on the local market. The second objective is support of the "two-way street" reciprocal procurement concept.

Improving NATO Logistics Organization and Support Arrangements

Senior NATO Logisticians Conference (SNLC). The SNLC, which held its first meeting in February 1978, provides advice and policy on NATO Consumer logistics matters (as contrasted to production logistics, which is handled by the CNAD). During 1980, the SNLC placed increased emphasis on improving the war reserve stock levels, particularly ammunition and fuel.

Assistant Secretary General for Infrastructure, Logistics and Council Operations, and NATO Headquarters Staff. An Assistant Secretary General for Infrastructure, Logistics, and Council Operations (ASG (ILCO)), together with a Director of Logistics were established in 1979 to provide NATO Headquarters the capability to improve coordination of Alliance logistics actions. This new staff will monitor and manage the Alliance's logistics program at the NATO Headquarters level.

Utilizing the NATO Maintenance and Supply Agency (NAMSA). NAMSA is the principal multilateral NATO logistics organization. It provides logistics support for designated weapon systems on a multinational basis to NATO members desiring its services. The U.S. is the main supplier to NAMSA, but has made only limited use of it for logistics support of U.S. forces. This is because the U.S. has had full capability to support U.S. forces in Europe and also has broader worldwide logistics responsibilities which influence the choice of logistics support modes. More importantly, NAMSA has declined to enter into contracts requiring full compliance with U.S. procurement laws and regulations. All other NATO nations contract with NAMSA in accordance with NAMSA regulations and procedures. Since the passage of P.L. 96-323, the NATO Mutual Support Act of 1979, these contractual barriers may be waived.

Interoperability

This important NATO requirement has led to a number of constructive actions, some of which are reported here.

NATO Aircraft Battle Damage Repair (ABDR). The main objective of the ABDR Program is to enhance combat availability and sortie generation rates of tactical aircraft during surge and intense phases of hostilities through rapid repair of battle damaged aircraft. Rapid ABDR is defined as the repair of battle damaged aircraft as fully and quickly as possible within the constraints of an intense combat environment.

Aircraft Cross-Servicing. The NATO Aircraft Cross-Servicing Program is designed to improve the capability of Alliance aircraft to recover at an allied air base, other than the home base, rearm with allied munitions and be retasked for a subsequent mission. This program is based on a selected "family" of air-to-surface and air-to-air munitions for cross-servicing by NATO tactical air forces.

Fuel Standardization. NATO's fuel standardization program is continuing and has resulted in the standardization of fuels for land and sea forces. Air forces have selected JP-8 (NATO F-34) jet fuel, which is commercial Jet A-1 grade fuel with additives, for use in Europe.

Interchangeable Ammunition. The interchangeability and standardization of ammunition within NATO is critically important to the improvement of operational capability, force flexibility, sustainability, and simplification of the logistics system. During the past year, progress has been made in certifying artillery, mortar, and tank gun ammunition for firing from U.S. and allied weapons.

U.S./DoD Logistics Master Plan (LOGMAP) for NATO Logistics Master Planning System (LOGMAPS)

The U.S. implemented the U.S./DoD LOGMAP in July 1978. The original LOGMAP has been updated to reflect progress in the LTDP and be more responsive to LTDP reporting and tracking requirements. The LOGMAP is designed to help achieve DoD objectives for U.S. and NATO logistics, and integrate these actions along with other DoD priorities into the DoD management system for programming and funding.

The Assistant Secretary General for Infrastructure, Logistics and Council Operations used the U.S./DoD LOGMAP as a guide in developing a NATO LOGMAPS, which will track implementation of LTDP logistics measures. LOGMAPS provides a means of promulgating the NATO "haromonized" logistics program which the Alliance can use to determine participation required and measure progress at appropriate intervals. It also provides the means for control, direction, and coordination of the functional responsibilities of NATO commands and agencies as well as member nations and their components involved in NATO logistics readiness.

The concept of a NATO LOGMAPS envisions each nation developing a national LOGMAP similar to the U.S. In this way, nations can easily consider support to and from other nations and the interface of Alliance defense planning in their national logistics planning. During 1980, a series of experimental LOGMAPS task sheets were produced, together with a manual giving the details needed to interpret and operate the LOGMAPS. The LOGMAPS is expected to be fully operational by the end of 1981.

NATO Infrastructure

The NATO Infrastructure program is a commonly-funded program which provides facilities and equipment in support of the wartime operations of NATO-assigned forces and for some of their peacetime training. With the recent addition of the Reinforcement Support Category (RSC), there are now 13 NATO Infrastructure eligible categories and these encompass a wide-variety of construction and capital equipment procurement for operational facilities, such as hardened aircraft shelters, war headquarters, automated satellite and ground communications systems, early warning radars, command and control electronic networks, airfield and naval base facilities, petroleum storage and pipelines, missile launch sites, secure nuclear warhead storage, air/sea reception facilities, prepositioned material storage for reinforcement forces and selected training facilities for multinational use. Support for NATO funding is restricted to those projects which (1) support NATO operational plans and NATO-assigned forces, (2) possess a high degree of common interest, including availability for use by all NATO forces during wartime and (3) conform to NATO-approved criteria and standards which do not exceed established minimum requirements for wartime operations.

Nations determine the military construction required to support NATO general defense plans and NATO force assignments, with overall infrastructure priorities established by the major NATO commanders. These requirements are translated into specific infrastructure projects and submitted for consideration to the Major NATO Commanders (MNCs). The MNCs then determine the higher priority needs and include these in a recommended annual program (a

Slice) which is forwarded to the NATO Military and Infrastructure Committees for screening and endorsement and to the DPC for final approval.

The program is normally cost-shared by the 13 nations having military forces assigned to NATO (excludes Iceland). France, however, does participate in selected areas, e.g. Warning Installations and in those instances, funding is shared by 14 nations on a different cost-share basis. Financial ceilings and national cost-shares are negotiated every five years. The ceiling of the current 1980-1984 cost-sharing period was set in May 1979 at one billion IAU (Infrastructure Accounting Unit) which equates to approximately $4.7 billion. The U.S. contributes a share of 27.4 percent under the current cost-sharing arrangement.

NATO TRAINING STATUS

Joint or multinational training NATO continues to be a major rationalization area with considerable potential for increased effectiveness. When allied military personnel train together in a common course of instruction, using common facilities and equipment, they learn to work together and to utilize common procedures. Moreover, in the long run, their national military forces will find it easier to agree on the common doctrine and tactics necessary to operate together effectively in combat. Another very important consideration is that consolidated training is often less expensive because of economies of scale.

This section discusses the current status of major NATO joint training activities and training cost arrangements, as reported in the Seventh Annual Report of the Secretary of Defense to the Congress on Rationalization, Standardization and Interoperability, dated January 1981. Within NATO, the Euro NATO Training Group is the organization charged with developing proposals for useful cooperative training. This group consists of training experts from all Alliance nations except France, Luxembourg and Iceland.

The benefits of a number of cooperative training projects are discussed below. Most noteworthy is the signing by 12 NATO Defense Ministers in December 1980 of an MOU which approves the establishment of a Euro NATO Joint Jet Pilot Training Program in the U.S. beginning in 1981. This program, the largest combined training project undertaken within NATO, is truly cooperative with participating countries sharing the cost and providing instructor pilots and staff as well as students. More details on this project are given below.

Obstacles to Alliance cooperation in training include differences in operational doctrine, procedures and military equipment. Differences in national doctrine make nations reluctant to send their personnel to training courses of other nations. This problem would be alleviated if nations would train using common NATO rather than diverse national doctrine and procedures. To the degree there are major allied differences in equipment, cooperative training opportunities tend to be limited to the basic level.

Progress in Specific Projects

Basic Helicopter Training. This joint helicopter pilot training project has been very successful both from the viewpoint of Alliance cooperation in pursuing common goals and as a demonstration of savings achievable through common training.

International Long Range Reconnainance Patrol (ILRRP) School. Due to the outstanding acceptance of the original course on Warsaw Pact recognition training, special recognition training courses were developed and are being attended by an increasing number of students from NATO Armies.

Euro NATO Engineer Courses (ENTAC). The courses provide instruction for platoon leaders and instructor personnel using CENTAG and NORTHAG scenarios on the identification, use and transfer of NATO engineer munitions and documentation as concerns the turnover of obstacles.

NATO Tactical Fighter and Weapons Training Center (NTFWTC) in Europe. Because NATO does not have an adequate aircrew combat training facility, some of the NATO nations have been participating in aircrew combat training exercises in the U.S. The Alliance needs a facility in Europe that would offset some of the costs associated with conducting this training in the U.S. and which would provide the added benefit of a NATO environment for training. This facility, cooperatively managed, proportionately financed and manned by the Alliance and providing for ordnance ranges, air combat manuevering instrumentation ranges, low-level routes, tactical air support of maritime operations, electronic warfare training, fighter weapons instructor training and joint exercises, could add greatly to combat readiness and RSI within NATO.

Euro NATO Joint Jet Pilot Training (ENJJPT). Because of the high cost per student involved in training jet pilots, the Alliance would benefit from the cost effectiveness and the better and more standardized training resulting from a cooperative pilot training program. The Euro NATO Training Group approved initiation of a project several years ago which would use a NATO-developed syllabus, a joint NATO faculty, and facilities dedicated to NATO. If all Euro NATO nations chose to participate, ENJJPT initially could graduate 320 students (including 110 U.S. students) per year from a single training site, with as many as 740 students in the long term.

The Euro NATO Training Group concluded in 1976 that, for the short term (10 years), the ENJJPT could be conducted most effectively in the U.S. because of a combination of adequate facilities, favorable weather, relatively uncongested air space and significantly lower costs. The ENJJPT Working Group completed the program memorandum of understanding (MOU) in June 1980 and the Ministers of Defense signed the MOU at the December 1980 DPC Ministerial, providing for initiating the program in October 1981. ENJJPT is the most significant accomplishment of the Euro NATO Training Group to date and probably the most ambitious program of its type ever approved in NATO. It should contribute significantly to enhanced RSI.

Training Cost Issues

Use of Incremental Costing. The costs charged by one NATO nation for training personnel of other NATO nations are determined by principles established in STANAG 6002, which has been ratified by all NATO nations except Iceland. STANAG 6002 (Principles and Procedures for the Conduct and Financing of Common Training) deals with the training of individual students using existing national facilities and directs that training will be provided on an incremental cost basis. Because of restrictions included in the Arms Export Control Act of 1976, U.S. ratification of STANAG 6002 included a reservation

that the U.S. must charge direct costs but could waive indirect costs and administrative surcharges on a reciprocal basis. The UK included a similar reservation in its ratification.

The majority of the NATO countries are concerned with the U.S and UK reservations and are pressing, in some cases at the Ministerial level, for the use of incremental costs for all training under STANAG 6002. For many years, our allies have followed the concept of incremental costing in assessing charges for training conducted for other countries, and they are asking the U.S. and the UK to do the same. However, new U.S. legislation is required before the U.S. can ratify STANAG 6002 without the current reservation. DoD proposed legislation to the 96th Congress that would permit the charging of incremental costs on a reciprocal basis for training the U.S. performs for other NATO nations. DoD intends to resubmit this proposal to the 97th Congress and recommends that it be promptly enacted. Under the proposal, the U.S. would charge its NATO Allies only the additional costs attributable to the additional allied students. The costing method the law now stipulates requires the U.S to charge its NATO allies, in addition, part of the fixed costs of the training base which the U.S. would incur even if it trained no foreign students. The incremental costing approach would eliminate the fixed cost charge.

Medical Costs for Trainees. A provision in the DoD FY 81 Appropriation Act, enacted in December 1980, will adversely affect the development of common training within NATO and create difficulties with our allies. Section 767 of the Act (96-527 dated 15 December 1980) requires that DoD be fully reimbursed for the cost of providing in-patient hospital care to foreign military and diplomatic personnel and their dependents. This provision runs contrary to our implementation of the NATO SOFA Agreement (The Agreement Between the Parties to the North Atlantic Treaty Regarding the Status of Their Forces, London, 1951) which states that the military personnel of NATO countries and their dependents may receive medical and dental care, including hospitalization, under the same conditions as comparable personnel of the receiving state. The U.S. is a party to this agreement.

The new legislation also runs contrary to NATO STANAG 6002 which the U.S. has ratified in accordance with a Congressional mandate. STANAG 6002 states that (1) costs will not be charged for accommodating trainees in receiving nation's facilities except where such costs are charged to members of the receiving nations as well and (2) trainees will be provided with medical and dental care without charge to the greatest extent possible. SECDEF has requested Congress, at the earliest opportunity, to enact legislation which would exempt the personnel of NATO nations, particularly those undergoing training in the U.S., from paying full costs for in-patient hospital care in U.S. facilities. This would permit the U.S. to comply with the provisions of SOFA and STANAG 6002, which the U.S has ratified.

SUMMARY

A comprehensive tailored LSA and an effective ILSP are prerequisites for accomplishing NATO RSI. This plan can only be achieved by a cooperative effort between U.S. and foreign logistics personnel. The earlier ILS is made a part of joint planning, the easier it will be to support effectively the multinational weapon system. It is the responsibility of a program manager to

ensure a successful ILS program. It is recommended that NATO personnel receive formal training and indoctrination in MIL-STD-1388 LSA to facilitate their participation in the process.

14. DISCLOSURE OF MILITARY INFORMATION

INTRODUCTION

According to the National Disclosure Policy, classified military information is a national security asset which must be conserved and protected, and which may be shared with foreign governments and international organizations only where there is a clearly defined advantage to the U.S. Advance planning by a program manager to assure prompt compliance with the National Disclosure Policy will contribute to the success of cooperation international programs and the sharing of information with our allies.

The purpose of this chapter is to give the PM a good grounding in such policy to facilitate his conformance with it. The topics covered include the National Disclosure Policy as it affects releasability of classified information to foreign governments, visitation procedures, foreign attendance at meetings, and industrial security.

NATIONAL DISCLOSURE POLICY

U.S. classified information is provided only to officials of the U.S. Government and to U.S. Defense contractors who have the proper security clearance, can provide sufficient safeguards against disclosure, and who have a need to know the information in order to do their job. Such military information may be provided to foreign governments and international organizations when it can be shown that advantages will accrue to the United States from this sharing. In recognition of this fact, a policy has been established under which U.S. officials may release classified military information to foreign governments and international organizations. This policy is known as the National Disclosure Policy.[1]

The basic disclosure policy was issued in 1971 by the National Security Council with Presidential approval. That policy, its objectives and implementing responsibilities, were reaffirmed by President Carter in 1978. Under the policy, the Secretaries of State and Defense are jointly responsible for controlling the disclosure of classified military information to foreign entities. When appropriate, they will consult with the Director, Central Intelligence; the Secretary, Department of Energy; and heads of other Departments and Agencies. The Secretaries of State and Defense have established an interdepartmental committee, the National Disclosure Policy Committee, to implement the policy. The Committee is responsible for promulgating specific disclosure criteria and to consider requests for exceptions to the policy.

The basic policy governs the disclosure of classified military information. Such military information is information under the control of, or of primary interest to, the Department of Defense and its departments or agencies and which requires protection in the interest of national security. In this

[1]This discussion of National Disclosure Policy is derived from a speech by Arthur Van Cook, Director of Information Security, OUSDP, to the National Classification Management Society, 24 June 1980.

context, disclosure refers to the authorized transfer of classified military information to a foreign government or an international organization, such as NATO. The policy also controls the release of information about equipment on the Munitions List which is published by the State Department.

There are several categories of information specifically not covered by the policy. National Intelligence, for example, is controlled by the Director, Central Intelligence and the National Foreign Intelligence Board, while the release of communications intelligence is controlled by the National Security Agency and Director, Central Intelligence (DCI). The DCI also controls the release of counterintelligence information and products. Communications security information is controlled by the U.S. Communications Security Committee. The Atomic Energy Act of 1954, as amended, governs the release of atomic information; and the Secretary of Defense and the Joint Chiefs of Staff control the release of strategic planning and guidance information.

The most important aspect of the policy is that classified military information is a national security asset, an asset that must be conserved and protected, but which may be shared with foreign governments and international organizations. However, this asset is shared only when there is a clearly defined advantage to the United States. To amplify this point, the basic policy sets forth five policy objectives, or criteria, all of which must be satisfied before deciding to disclose classified military information to a foreign government or international organization.

- The first is that the disclosure must be consistent with the U.S. foreign policy toward the recipient nation or organization. Normally, we will exchange information with countries who are pursuing military and political objectives similar to our own. However, we may release information to a country with distinctly different military and political objectives from ours, if a specific national purpose, diplomatic or military, is served.

- The second objective to be met is that the disclosure must not seriously jeopardize the military security of the United States. In assessing this risk, we must examine carefully, for instance, the level of technology or the sensitivity of the information involved in a particular disclosure and determine the effect on our national security should the information be compromised. Part of this determination is based on the extent to which the technology or information is already known by other countries, and the likelihood of compromise.

- The third policy consideration is the assessment of the foreign recipient's ability to give the information substantially the same degree of security protection that we give it. This is designed to reduce the risk in sharing information. Some recipients may provide greater security for classified information than that afforded by us. In order to protect the information, the recipient must have not only the capability but the intent. We establish intent by executing a written General Security of Information Agreement. This is a reciprocal agreement negotiated between the U.S. and the foreign governments, which reflects both parties' intent to protect each other's information. The Department of State is responsible for negotiating these agreements, which it does through the respective U.S. Embassies. The

National Disclosure Policy Committee is charged to ascertain the capability of the foreign government to protect our information by conducting periodic on-site surveys. Through the State Department and U.S. Embassy concerned, we obtain the host government's approval and assistance in conducting this survey. The survey teams, comprised of top-level security specialists from agencies concerned with foreign disclosure, review the security laws, procedures and practices of the government to determine its ability to protect our information. Governments with whom we exchange classified military information are welcome to perform reciprocal security surveys here. Of course, the National Disclosure Policy Committee is guided by the team's findings and acts on its recommendations.

- The benefits to the United States must be at least equivalent to the value of the information disclosed. Since classified military information is a valued asset, we should treat it with a sense of worth. This concept ties all aspects of the policy together and relates it to the real world. The benefits could be a quid pro quo exchange of military intelligence on a potential adversary. In a coproduction arrangement, it might be to our advantage to share state-of-the-art technologies. The improvement in the military capability of the recipient government also might be in our best national interest.

- The last policy consideration is whether the information to be provided is sufficiently limited only to that which is necessary to accomplish the purpose of disclosure. This is a common sense requirement to minimize the chances of possible loss of the information and still do the job. This requirement is consistent with the familiar need-to-know requirement here in the United States.

Benefits may be obvious, but so are the risks. Though, in some cases, it may be in our best interest to assist a developing country with intelligence information on insurgents' strength and plans, there is a risk of compromise because of the intended recipient's inadequate security procedures. The decision maker involved must analyze possible damage to national security if the information is compromised, and evaluate the country's capability to protect the information to determine the minimum amount of information needed to satisfy the purpose.

National Disclosure Policy Committee (NDPC)

The Secretaries of Defense, State and the Military Departments and the Joint Chiefs of Staff are represented on the National Disclosure Policy Committee as General Members. General Members have a broad interest in all Committee operations. Please recall that the Secretaries of State and Defense have a responsibility to consult with other officials as appropriate. These other officials, the Director, Central Intelligence Agency; the Under Secretaries of Defense for Policy and Research and Engineering; the Assistant Secretary of Defense for International Security Affairs; and the Assistant to the Secretary of Defense for Atomic Energy, are represented as Special Members. Special Members have an interest in only certain facets of Committee operations. For example, the Directors of the intelligence agencies, both represented as Special Members, are primarily interested in disclosures of intelligence information. The Air Force representative, a General Member, may

have an interest in the disclosures of Army and Navy weapons because of common technology used in the manufacture of these weapons or components.

By agreement between the Departments of Defense and State, the representative of the Secretary of Defense chairs the Committee. The Secretary of Defense also is responsible for administration of the Committee, and issues the document which implements the National Disclosure Policy with the concurrence of State, Energy, and the DCI. The Secretary of Defense has designated the Deputy Under Secretary of Defense for Policy to be the senior official in the Department responsible for foreign disclosure matters. Senior DoD Members on the NDPC and their points of contact are shown in Figure 14-1.

FIGURE 14-1. POINTS OF CONTACT FOR KEY DoD MEMBERS ON THE NATIONAL DISCLOSURE POLICY COMMITTEE

OFFICE OF THE SECRETARY OF DEFENSE	
(Chairman) Director, Information Security, OUSDP	695-2686 -2289
OFFICE OF THE JOINT CHIEFS OF STAFF	
General & Organizational Policy Division	694-3681
Plans and Policy Directorate	697-8534
DEPARTMENT OF THE ARMY	
Director of Counterintelligence, OACSI	695-2675
DEPARTMENT OF THE NAVY	
Technology Transfer Policy & Control Division (OP62)	697-0889 -0899
DEPARTMENT OF THE AIR FORCE	
Foreign Disclosure Policy Group	695-2917
(HQ USAF/CVAIP)	697-2790

(Other members represent OUSDRE, OASD(ISA), OATSD(AE), DIA, Department of State, CIA, DOE & NASA).

The large volume of disclosure decisions required does not allow the Committee itself to act on each case. Consequently, disclosure authority must be delegated. Disclosure authority in the Defense Department has been delegated to the Secretaries of the Military Departments, the Joint Chiefs of Staff, the Director, Defense Intelligence Agency, and a few other key Defense officials. They may in turn delegate this authority in writing. In order to provide guidance to those officials who have been delegated disclosure authority, the Committee has developed disclosure charts as an annex to the National Disclosure Policy. An example of the charts is in Figure 14-2. These disclosure charts set forth classification eligibility levels in eight categories of information for most foreign governments and each international organization to which we release classified military information. Disclosure

officials are authorized to disclose information up to the classification levels specified in the charts (TS, Top Secret; S, Secret; C, Confidential, and X, through Secret on Communist Countries only) for the particular category of information, provided each of the five disclosure policy objectives or criteria discussed earlier can be met. Each decision is made on a case-by-case basis.

FIGURE 14-2. ANNEX TO NATIONAL DISCLOSURE POLICY

	DISCLOSURE CHARTS		
CATEGORIES	COUNTRY A	COUNTRY B	COUNTRY C
1. ORGANIZATION, TRAINING AND EMPLOYMENT OF MILITARY FORCES	S	C	
2. MILITARY MATERIEL AND MUNITIONS	S	C	
3. APPLIED RESEARCH AND DEVELOPMENTAL INFORMATION AND MATERIEL	C		
4. PRODUCTION INFORMATION	C		
5. COMBINED MILITARY OPERATIONS, PLANNING AND READINESS			
6. U.S. ORDER OF BATTLE			
7. NORTH AMERICAN DEFENSE			
8. MILITARY INTELLIGENCE	TS	S	X

S=SECRET, C=CONFIDENTIAL, TS=TOP SECRET, X=THRU SECRET ON COMMUNIST COUNTRIES ONLY

There are eight categories of information listed in the charts. Category 1 (Organization, Training, and Employment of Military Forces) includes military information of a general nature necessary to the organization of military, paramilitary, or irregular forces to include those tactics, techniques and tactical doctrine necessary to train and employ them. Category 2 (Military Materiel and Munitions) encompasses all military materiel, arms and munitions procured and controlled by the U.S. Government for the equipage, operation, maintenance and support of its military forces or the military, paramilitary or irregular forces of its allies. Items developed under U.S. Government contract or derived from technology paid for by the U.S. Government

are included in this category. In sum, this category comprises information to include technical data and training necessary to operate, maintain, or support specific military materiel, arms or munitions. Category 3 (Applied Research and Development Information and Materiel) includ but is not limited to classified military information resulting from exte.sion of fundamental theories, designs, and data from purely theoretical or experimental investigations into possible military appl' 'ations to include research, the construction and testing of prototypes and such design changes affecting qualitative performance as may be required during the service life of an item. Category 4 (Production Information) includes such things as designs, drawings, specifications, models, manufacturing techniques, and related information necessary to manufacture military materiel and munitions. Category 5 (Combined Military Operations, Planning and Readiness) includes that information necessary to plan, assure readiness for and provide support to the achievement of mutual force development goals or participation in specific combined tactical operations and exercises. Category 6 (U.S. Order of Battle) includes information pertaining to U.S. forces located within territory which is under the jurisdiction of a recipient government or is otherwise of direct concern to a foreign government or an international organization. Category 7 (North American Defense) includes information which concerns plans, programs, projects, and operations directly related to North American Defense. Category 8 (Military Intelligence) comprises information of a military character pertaining to foreign nations and areas as delimited by the exclusions noted earlier.

One final point must be emphasized. If the classification of the information proposed for disclosure exceeds that country's eligibility in the appropriate Category of the Charts, or if the policy criteria cannot be met, then the proposed disclosure must be denied or an exception to policy must be obtained to permit the disclosure. Moreover, even if the U.S. disclosure official has determined that eligibility in the Charts exist and that all policy criteria have been met, disclosures of classified military information may not be made until the affected originator's approval has been obtained and/or appropriate authority to disclose has been received. To repeat, all disclosure authority rests in the first instance with the head of the Department or Agency which originates the information. In addition, all disclosure officials must be certain that they possess the required authority to disclose the information in question.

Exceptions to Policy

There are normally about 60 requests for exceptions to policy annually. These requests normally involve situations where it is determined that the information proposed for release exceeds the intended recipient's eligibility in the particular category in the disclosure chart, or it cannot be ascertained that the recipient has the capability to protect the information. Requests for exception to policy normally emanate from the Military Departments since, in most cases, they own the information. On occasion, the State Department or Defense Department's International Security Affairs office requests an exception to policy where foreign policy is a principal consideration. In most cases, however, the requests deal with the transfer of weapon systems and other military hardware. The NDPC adjudicates the requests making sure that all of the disclosure criteria are considered and that the release of information ultimately results in a clearly defined advantage to the United

States. It is the responsibility of the requesting agency to ensure that the Committee is presented with all the information needed to make a sound decision. The Committee must be convinced that it is in the best interests of the United States to share U.S. information with a foreign government. A great deal of research and coordination goes into the development of these requests.

If the Committee cannot reach a unanimous decision, the request is not shelved. In these cases, the Chairman must weigh the arguments for and against the disclosure and issue a decision. His decision is subject to appeal within ten working days by any of the Committee members having an interest in the matter. Ultimately, this appeal may reach the desk of the Secretary or Deputy Secretary of Defense whose decision is final. If the Chairman's decision is not appealed within the ten day timeframe, it stands.

Not all requests for exceptions to policy are considered by the Committee. The Secretaries of State and Defense, or their Principal Deputies may personally authorize exceptions to policy. However, before the Secretary of State, or his Deputy, may approve an exception to policy, they must have the concurrence of the Department or Agency having jurisdiction over the information involved -- normally Defense. Annually, about five exceptions to policy are granted by the Secretary or Deputy Secretary of Defense in time-sensitive situations.

False Impressions

It is the policy of the United States that we will avoid creating false impressions of our readiness to make available classified military materiel, technology, or information. Lack of strict adherence to this policy may create problems. Much of our military hardware is unclassified. However, this same unclassified hardware, if sold, may require the release of sensitive classified information for its operation or maintenance, or for the foreign recipient to receive training on it. Therefore, the disclosure decision must be made based on the classification level of all information which may be required for release if the system were to be acquired. If the proposed foreign recipient is not authorized to receive the highest level of classified information required, no information, not even unclassified may be released or discussed until the required authority is obtained. This means that there can be no weapon specific contacts, and no release of price or availability data until authority is obtained to release the highest level of classified information ultimately required for disclosure.

Recording of Disclosure Decisions

To help keep track of disclosure decisions, the Foreign Disclosure Automated Data System (FORDAD) was established as a central repository for such decisions.

Four types of information are recorded in FORDAD:

1. All decisions made by disclosure officials of classified documentary information or material. These are normally made within the guidelines of the National Disclosure Policy.

2. All decisions on requests for exceptions to policy.

3. All disclosures involving TOP SECRET information, and

4. All DoD decisions on Munitions License Applications.

This information is used on a routine basis to provide a background of previous, similar cases by weapon or country. It is also used to make damage assessments if a sudden change occurs in a foreign government which brings into question its capability to protect our classified information.

A new system, called the Foreign Disclosure and Technical Information System (FORDTIS) is being developed to replace FORDAD. FORDTIS represents a tremendous improvement over FORDAD as it will provide an interactive, real time terminal at each disclosure office. This system is to include also decisions on Foreign Military Sales, Munitions cases and Commerce licenses. FORDAD procedures are contained in DoD Instruction 5230.18.

TRANSFER OF CLASSIFIED INFORMATION

United States Government policies concerning the release of classified material to foreign governments and international organizations, such as NATO, are derived from law, Executive Orders, and Presidential Directives. These issuances prescribe rules for the protection of U.S. classified material and require that such material be released on a government-to-government basis. Further, care must be exercised to assure compliance with U.S. Government arms export control laws as set forth in the Department of State International Traffic in Arms Regulations (ITAR); government arrangements cannot be used as a means to bypass the provisions of ITAR. For these reasons, Department of Defense policies differentiate between access to U.S. information and technology by foreign government officials and access by representatives of foreign industry, and between contacts by foreign representatives with DoD elements and contacts with U.S. defense contractors.

Requests by foreign governments, international organizations, and their authorized representatives as well as U.S. generated proposed disclosures are to be forwarded to the appropriate disclosure office of the originating Service, agency, or Joint Chiefs of Staff (for strategic plans and combat operations) for authorization of the disclosure. When transfer is authorized, the information is to be transmitted government to government only, even in the case of classified information held by U.S. defense contractors when the ultimate destination is a foreign government or contractor. Transmittal will be in accordance with DoD Information Security Program Regulation 5200.1-R. Disclosures and denials are to be recorded in FORDAD. Figure 14-3 lists the applicable DoD and Service Security policy publications. The decision process on foreign requests is to be handled in a judicious and expeditious manner.

FIGURE 14-3. DoD AND SERVICE SECURITY POLICY PUBLICATIONS

DoD	ARMY	NAVY	AIR FORCE
DoDD 5000.19		SECNAVINST 5260.1C	AFR 178-7
DoDD 5030.14		OPNAVINST 5510.48 (Series)	
DoDD 5030.28	AR 12-6	OPNAVINST 4000.36F	AFR 400-43
DoD Regulation 5200.1-R	AR 380-5	OPNAVINST 5510.1F (App. G)	AFR 205-1
DoDD 5220.6	No Service Implementation Required		
DoD 5220.22-M&-R	AR 380-49	OPNAVINST 5540.8F	
DoDD 5230.3		SECAVINST 5720.44	AFR 190-12
DoDD 5230.9	AR 360-5	SECNAVINST 5720.44	AFR 190-17
DoDD 5230.11	AR 380-10 AR 380-11	SECNAVINST 5510.24D	AFR 200-9
DoDI 5230.17	AR 380-10 AR 380-11	SECNAVINST 5510.26A	AFR 200-9 HOI 200-3
DoDI 5230.18	AR 380-10 (In Part)	OPNAVINST 5510.127A	AFR 200-6
DoDI 5230.20		SECNAVINST 5510.31	AFR 200-9

Normally, classified information is transferred to foreign governments under the following:

- International agreements (DEA, IEP, MOU, MOA)
- Symposia and conferences
- Foreign visits and accreditations
- Foreign military sales, loans, or grants of classified items
- Foreign participation in DoD Component training activities
- Personnel exchange program (foreign integrated personnel)
- Scientist/Engineer exchange programs
- Commercial arrangements under the International Traffic in Arms Regulations

The program manager and his staff should request specific written approval for the disclosure of classified (and unclassified, if subsequent discussions would lead to the release of classified) information from the appropriate designated disclosure authority prior to disclosure. This approval should include the general parameters within which disclosures may be made in the course of conducting business overseas on official travel. Presentations at symposia and conferences should meet the provisions of DoD Directive 5200.12, entitled "Security Sponsorship and Procedures for Scientific and Technical Meetings Involving Disclosure of Classified Military Information," dated 15 June 1979, and reference lists and bibliographic material should be screened to delete material that is not releasable to participants.

The following standards shall also be met, prior to DoD Component approval, for release of any information, classified or unclassified, relating to foreign military sales, leases, loans, or grants of classified items.

- Extreme care shall be exercised in the release of technical data that may involve design, manufacturing, production or system integration technology. In certain instances, it shall be necessary to edit or rewrite data packages to exclude information that is clearly beyond that which has been authorized for disclosure.

- Classified material or data must be moved under security safeguards appropriate to the transportation mode employed, as established by DoD Regulation 5200.1-R.

- Classified information authorized for release in pursuance of a possible sale shall be limited to general information, usually no higher than CONFIDENTIAL, on system characteristics, capabilities, price, and availability until a sale is consummated. No specific information on system countermeasure (CM) susceptibilities or vulnerabilities or counter-countermeasures (CCM) capabilities may be disclosed until the sale is consummated. After consummation of the sale or grant, classified information may be released up to the level authorized for the foreign recipient.

- Small numbers as sample items for evaluation are discussed in detail in Chapter 11 on Foreign Weapons Evaluation.

- Information for which the U.S. Government does not own full rights is discussed in Chapter 8 on Intellectual Property.

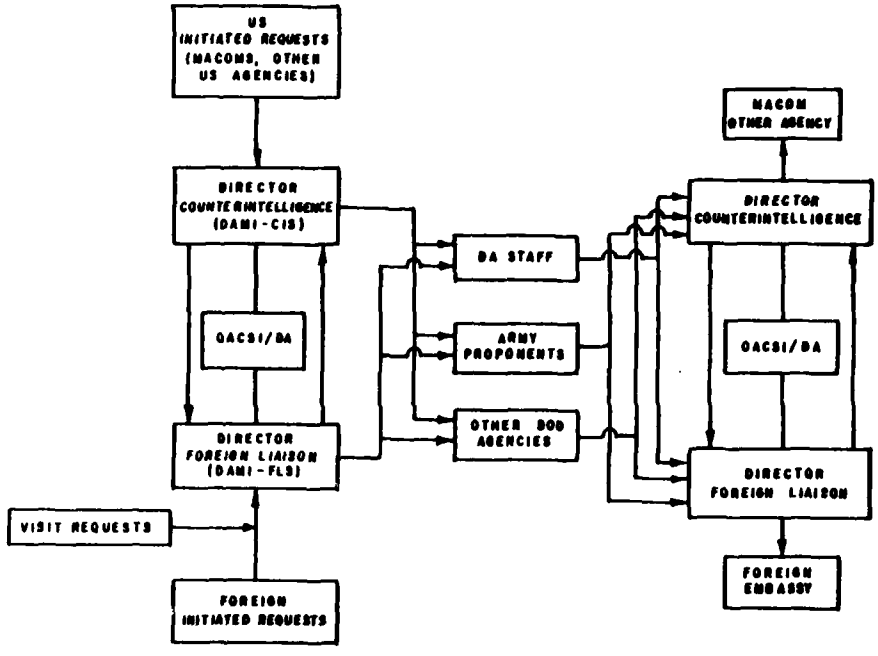
- In those instances involving disclosure of intelligence information, care shall be exercised to ensure that the disclosure shall not jeopardize U.S. intelligence sources and collection methods.

Army Requests

Requests for information are received from foreign governments or from Army commands/activities for passing to foreign governments under various international agreements of data exchange. As shown in Figure 14-4, foreign requests are directed to the Director of Foreign Liaison, and U.S. initiated requests are directed to the Foreign Disclosure Team, Directorate of Counterintelligence. These directorates coordinate the releases with Army staff activities, commands, and with activities external to the Army, as required.

Based upon the responses received and current policy concerning both the country and the information to be released, a releasability determination is made at the Department of Army staff level. Approved documentary releases are made by the Directorate of Foreign Liaison to the foreign embassy in Washington as a government-to-government exchange.

FIGURE 14-4. ARMY INFORMATION SECURITY PROCEDURES



The clearance staffing procedure for foreign visits is essentially the same as for other information releases. Visits, however, are almost always limited to oral/visual releases.

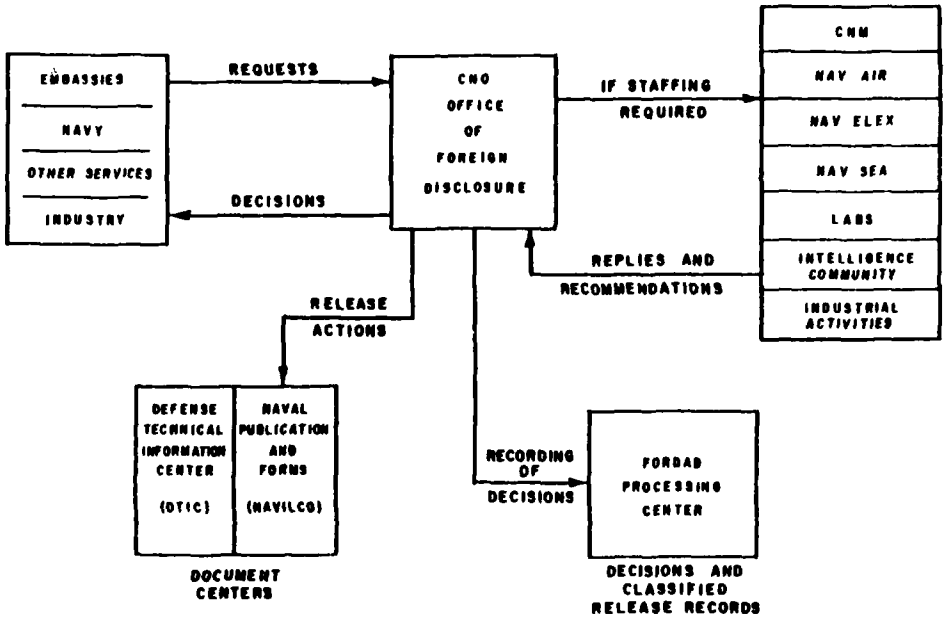
Navy Requests

Requests for documentary information to the Navy are normally received by the Chief of Naval Operations (CNO Op-621) from the foreign embassies, other Services, industry and other offices within the Navy (see Figure 14-5). When possible the decision to release documentation is made without staffing. However, when staffing is necessary the replies are consolidated and coordinated prior to the release determination.

The Naval Publications and Forms Center in Philadelphia is the primary source of documents to satisfy Navy document requests. Requests for documents that have been determined to be available to the general public are referred to the Defense Technical Information Center.

The Navy document request procedures are consummated by answering the originator's request and entering all denials and classified documentary releases into the FORDAD system.

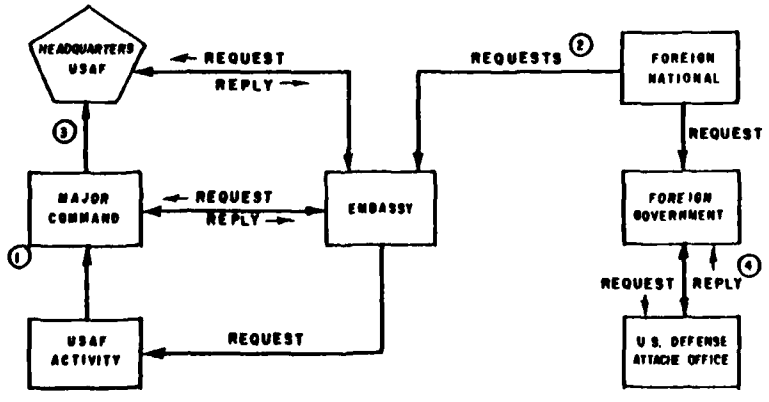
FIGURE 14-5. NAVY INFORMATION SECURITY PROCEDURES



USAF Requests

Transfer of all classified and some unclassified USAF documents must be done on a government-to-government basis. Figure 14-6 portrays the different modes of transfer. The numbers on the figure relate to the numbered paragraphs below.

FIGURE 14-6. AIR FORCE INFORMATION SECURITY PROCEDURES



1. USAF activities may propose release of documents, either unilaterally or in response to a specific request.

2. A foreign national may request documents through his embassy in Washington, D. C.

3. Some authority to release information is delegated to major commands. If a request exceeds that authority, then it is elevated to the next higher echelon for release determination.

4. USAF attaches may respond to requests under certain Defense Intelligence Agency instructions.

In all cases, foreign nationals should be encouraged to use the facilities of their embassy in Washington, D. C. Requests received directly from foreign nationals should be forwarded through major command disclosure channels to HQ USAF/CVAII.

UNCLASSIFIED TECHNICAL INFORMATION DISCLOSURE

The channels, controls and procedures for disclosing unclassified documents are essentially the same as for classified documents. Again, the appropriate foreign disclosure office must always approve disclosing any information and material, whether or not the documents or materials have been approved for previous disclosure. Unclassified technical or other material and information should be distribution-limited by the originator when he wishes to impose additional protection. Distribution-limited information should then be released only through specifically-approved government-to-government channels, based upon appropriate release authority. Only documents cleared in advance for public release should not be marked "distribution-limited".

CONTROL OF FOREIGN REPRESENTATIVES

DoD Instruction 5230.20, entitled "Policy and Procedures for the Control of Foreign Representatives," dated 30 April 1980, sets forth standard procedures concerning requests for visits, accreditations, and other related matters. Accreditation as used in DoDI 5230.20 pertains only to foreign representatives, military or civilian to include U.S. citizens, who are officially employed by a particular foreign government. As implemented by the Military Departments and the Defense Intelligence Agency, "accreditations" are extended only to the foreign government-sponsored officials who have a frequent need for contacts with DoD departments and agencies, such as liaison officers and procurement officials. Normally, those individuals are assigned to the foreign embassy or mission in the United States. Those foreign officials who do not have a frequent need, such as foreign government officials stationed outside the United States and foreign industry representatives, must apply for either a one-time visit authorization or an extended visit authorization.

Visitation Procedures

Except for those visits approved by the immediate office of the Secretary of Defense and Deputy Secretary of Defense, the Director, Defense Intelligence Agency (DIA) processes requests for visits and accreditations for

OSD, the OJCS, the Unified and Specified Commands, Defense agencies, and their defense contractors. The Services process requests for their own departments and Department of Defense contractors. Foreign requests to visit DoD contractors shall be reviewed concurrently by the three Military Departments. Correspondence with DoD contractors relative to approved foreign visits shall be coordinated by the Military Department that has been designated as the point of contact with the particular Defense Investigative Service Industrial Security Regional Office.

Requests by foreign embassies shall normally be submitted at least 30 days in advance for visits and 90 days in advance for accreditations. Visits carried out under the terms of an approved accreditation, extended visit authorization or one-time visit may take place after coordination with the PM office by the visitor, with at least 72 hours' advance notice to the office concerned. Requests for visits and accreditations submitted by foreign embassies should follow the examples as contained in DoDI 5230.20 at enclosures 3&4, respectively. Standardized notifications shall be used to advise foreign embassies of final action on requests for visits and accreditations. These standardized notifications are contained in DoD Instruction 5230.20 at enclosures 5&6, respectively.

Notification of approval of a foreign request for a visit or accreditation to a DoD Component shall be forwarded to the contact officer where the foreign representative is accredited, or where the representative will visit. This notification shall contain adequate guidance regarding the parameters of the subject matter and maximum permissible level of classified information that has been authorized for disclosure. The level of the disclosure authorization and detailed disclosure guidance may not be divulged to the foreign visitor; however, the foreign visitor should be informed of the classification of the information disclosed to insure that it is properly safeguarded. Only that information essential for accomplishing the stated purpose of the visit should be disclosed.

Disclosures of classified military information to foreign visitors and accredited foreign representatives shall be limited to releasable oral and visual information, unless the release of documentary information is specifically authorized in an approved visit request or letter of acceptance for accredited officials. Requests for classified documentary information resulting from a foreign visit shall be processed through normal foreign disclosure channels. In either case, the physical transfer of classified documentary information shall be effected through government-to-government channels.

An official visit by a foreign representative is approved on the basis of disclosure authorization and <u>not</u> a U.S. security clearance. The U.S. PMO should note the distinction between a U.S. security clearance and a disclosure authorization, and avoid the use of the former terminology in correspondence regarding an approved foreign visit request. A PM who wishes to invite foreign representatives to visit the PMO or a defense contractor, or who wishes to have a foreign representative accredited to the PMO, shall coordinate his actions with his Military Department before extending an invitation. This procedure is not required when the foreign representative is authorized recurring contacts as a result of an approved accreditation or extended visit authorization.

A foreign national may be permitted to participate in training if it pertains primarily to the operation and maintenance of a U.S. item, and is scheduled to be conducted after a purchase agreement has been signed by the prospective trainee's government, or after a Military Assistance Program order for the item has been issued by the Defense Security Assistance Agency. The foreign national may conduct classified training on a U.S. item after disclosure to the foreign national's government has been approved.

Foreign personnel integrated with the commands and PMO shall not be assigned to positions that would expose them to classified military or other sensitive information that is not releasable to their government. Detailed job descriptions shall be prepared by each office for those positions to which integrated personnel are assigned. Integrated personnel may have access to releasable classified military information on an oral or visual basis only. Such personnel may not act as an official representative of their government while assigned to a command or PMO, nor may they represent the command or PMO with other foreign governments or foreign representatives.

Foreign Attendance at Meetings

Department of Defense policy encourages foreign participation at meetings, seminars, and conferences related to contractual opportunities for equipment, weapon systems or programs which enhance our NATO defense posture. The Defense Department issued supplemental guidance in 1979 stating that release of classified military information related to such meetings would be governed by the National Disclosure Policy. The Military Departments are responsible for planning of foreign participation in these meetings. In such planning, the Departments should consider three factors previously covered: (1) decisions to approve the release of classified military information rest first with the originating department or agency, (2) not all foreign governments have the same eligibility for classified military information, and (3) the false impressions provision of the NDP. Other factors to consider are the Arms Export Control Act and Presidential policy concerning the transfer of sensitive technology discussed in Chapter 9.

Considering all of these factors, there is quite a bit of advance planning and coordination required if there is to be attendance by our allies at scientific and technical meetings. Presentations may have to be sanitized, or perhaps, if sanitization is not possible, "U.S. ONLY" sessions may have to be arranged. Presentations have to be limited to a classification eligibility level common to all foreign participants. Obviously, lowering the classification level of the presentations may penalize U.S. attendees, or those of our allies who may otherwise be eligible to receive most of the information to be presented. Therefore, care should be exercised when considering which foreign representatives to invite to these meetings and in public advertising of the meeting.

INDUSTRIAL SECURITY

The security of the U.S. depends in part upon the proper safeguarding of classified information released to industry. The objective of the Industrial Security Program is to assure the safeguarding of classified information in the hands of U.S. industrial organizations, educational institutions, and all organizations and facilities used by prime and subcontractors. The Industrial

Security Regulation (ISR), DoD 5220.22-R, sets forth policies, practices, and procedures of the Industrial Security Program used internally by the DoD to insure maximum uniformity and effectiveness in its application throughout industry. The Industrial Security Manual (ISM), DoD 5220.22-M, a companion document to the ISR, is a DoD publication which contains detailed security requirements to be followed by U.S. contractors for safeguarding classified information. The ISM is made applicable to industry by management's execution of the Department of Defense Security Agreement (DD Form 441), and by direct reference in the "Military Security Requirements" clause in the contract.

Administration of the Defense Industrial Security Program (DISP) is assigned to the Director, Defense Investigative Service (DIS). However, administration of the security cognizance concept has been assigned to the Director of Industrial Security, HQ DIS. Security cognizance authority has been delegated to the Regional Directors of Industrial Security for all contractor facilities physically located within prescribed regional boundaries. The Regional Director of Industrial Security performs all cognizant security functions prescribed in the ISR and ISM on behalf of all User Agencies, except in certain instances involving contractor activities on User Agency installations and for U.S. classified contracts awarded to U.S. contractors for performance abroad. In such instances, the Commander or Head of a User Agency installation is responsible for performing certain security actions.

While the ISR and ISM prescribe minimum industrial security requirements, User Agencies may augment these requirements by imposing more restrictive standards through incorporating them into the basic terms of the contract. User Agencies are not permitted to authorize lesser standards of industrial security, i.e., waivers, exceptions, deviations, etc., without the written approval of the DUSDP, his designee, or higher authority, or the Director for Industrial Security, HQ DIS. All requests for waivers or deviations are required to be submitted through the appropriate cognizant security office (DIS Regional HQ) to HQ DIS, ATTN: Director for Industrial Security. Any situation or emergency which indicates a need for clarification, modification, addition or deletion to either the ISR or ISM should be reported promptly, together with recommendations, through channels to the Director for Industrial Security, HQ DIS. However, the ISR should not be construed to limit in any manner the authority of the SECDEF, the Secretaries of the Army, Navy, and Air Force, or the Heads of User Agencies individually to grant access to classified information under their cognizance to any individual designated by them. The granting of such access is beyond the scope of the Industrial Security Program.

There are, in addition to the DIS Industrial Security Regional Offices, three primary DISP oriented field extensions of HQ DIS. They are the Defense Industrial Security Clearance Office (DISCO), the Defense Industrial Security Institute (DISI), and the Office of Industrial Security International (ISI).

Defense Industrial Security Clearance Office (DISCO)

The Defense Industrial Security Program (DISP) establishes procedures for safeguarding classified defense information which is entrusted to contractors. Included in these procedures is a system for determining the eligibility of industrial personnel for access to classified defense information. This function is performed centrally by DISCO. DISCO receives requests

for personnel security clearances from DoD contractors and from contractors of other user agencies; obtains Reports of Investigations (ROIs) from appropriate investigative agencies; evaluates personnel security request documentations and ROIs and issues clearances, if such actions are justified in light of the information being considered. Requests may be rejected by DISCO for certain administrative reasons, but rejection of requests, based on derogatory information, is not within the scope of DISCO authority. Derogatory cases are referred to the Office of General Counsel, DoD, Office of the Assistant General Counsel (fiscal matters), ATTN: Directorate for Industrial Security Clearance Review Office (DISCR) for determination. Overseas assignment notification, assurances, and reciprocal clearances are also processed by DISCO. DISCO maintains a computerized records system (MODISCO) for the preservation and ready accessibility of all industrial personnel and facility security clearances, maintains facility clearance records, and retains for the prescribed period the individual case folders pertaining to clearance actions. DISCO also controls shipment to contractors of the blank forms required for initiation of personnel security clearance actions. The DISCO is located in Columbus, Ohio.

Defense Industrial Security Institute (DISI)

Since 1972, the Defense Industrial Security Institute (DISI), located at Richmond, Virginia, has offered specialized security training to eligible industry and government personnel. Industrial management and government personnel are provided both with formal training as well as a forum in which to express recommendations for improvement of these programs. In addition to providing Industrial Security training, the Institute is also tasked with presenting courses of instruction on Information Security Management for Defense Department personnel. These courses include the Information Security Program and the safeguarding of classified information within the military establishment. DISI also provides counterintelligence awareness briefings to industry. Every other year, DISI schedules an International Industrial Security Orientation Program to familiarize foreign industrial security officials with the DISP, and to surface any difficulties or problems encountered pertaining to the implementation of bilateral agreements.

Office of Industrial Security International (OISI)

The Office of Industrial Security International is located at the NATO Support Activity (U.S.), 13 Chaussee de Louvain, St. Stevens Woluwe (Brussels), Belgium, and performs the following functions:

- Serves as a central point for maintaining records of Letters of Consent (clearances) and Security Assurances issued on behalf of contractor personnel assigned outside the U.S. Utilizes these records to process classified visit requests to U.S. Government, foreign government and NATO activities as may be required, and to confirm clearance data to such activities and contractors when appropriate.

- Processes requests for NATO Security Clearance Certificates and NATO Facility Security Clearance Certificates pursuant to DoD Directive 5210.60 and USSAN Instructions 1-69 and 1-70. Maintains an index of such clearances and disseminates clearance

verifications to U.S. Government, foreign government and NATO activities upon their request.

- Provides advice, guidance and assistance on industrial security matters to U.S. contractors, their employees and other individuals who have requested, been granted, or are being considered for security clearance or assurances. Administers security briefings and orientation when required and assists in facilitating classified visits by cleared industrial representatives.

- Provides advice, guidance and assistance on industrial security matters to U.S., foreign and international part organization officials. Maintains personal liaison with such officials on a recurring basis.

- Provides a repository for classified material which has been released by U.S. contractors or User Agencies for use by cleared industry representatives in the Brussels, Belgium area. Ensures that the material which is not releasable to foreign governments or their nationals is afforded safeguarding within a U.S. Government controlled activity.

- Assists in the establishment of government-to-government transmission channels between the U.S. and foreign governments. Serves as a conduit for the designated U.S. Government Representative in processing classified material received from or released to foreign activities located in the Brussels, Belgium area.

- Whenever possible, performs periodic inspections of U.S. contractor activities on U.S. controlled installations in Europe, the Middle East, and Africa when requested to do so by the Military Departments (Commander or Head of U.S. controlled installation).

User Agency Contracts Requiring Overseas Deliveries

When a U.S. Government agency (User Agency) places a contract with a cleared U.S. contractor which calls for delivery of classified information or materials to a foreign government (principally Foreign Military Sales contracts), the responsibility for delivery rests with the User Agency. It is extremely important that such contracts specify F.O.B. origin. Contracts which specify F.O.B. destination significantly impede compliance with government-to-government transmission requirements. Transmission of classified material must be in accordance with paragraph 1-601, ISR and paragraph 17, ISM. Parcel Post is not an approved method of transmitting classified material under the DISP. However, the contracting officer, or in the case of an FMS transmission, the Foreign Military Sales Office of the DoD component, is provided the latitude to approve special transmission arrangements.

Transmission of classified material to foreign addresses located in the U.S. or outside the U.S. must be on a government-to-government basis. In these few instances where the transfer is to occur in a foreign country, the material must be accompanied in transit by an approved U.S. cleared courier or

escort who would be responsible for acting as the U.S. representative at the point of debarkation. A previously identified and approved foreign representative would then receipt for the shipment. If the transfer is to occur in the U.S. certain requirements must be satisfied. They are as follows:

(a) The shipment must be to an embassy or other official agency of the recipient government which has extra territorial status, or currently provided for by paragraph 1-108, ISR has been coordinated with and concurred in by the Military Departments.

(b) For onloading abroad the carrier designated by the foreign government at the point of departure from the U.S., provided that an authorized representative of the foreign government is present to insure immediate onloading and to assume security responsibility for the classified material, or

(c) To a cleared U.S. contractor storage facility located at or near the loading point, or

(d) To a storage point or warehouse owned or controlled by the recipient foreign government which is protected by a trained guard force consisting of nationals of the foreign government or cleared U.S. citizens. In such cases, the storage facility must have been surveyed by a DIS Regional Industrial Security Specialist who has approved the physical security safeguards.

The principle of government-to-government release is an essential element of our national security policy. In those instances when U.S. classified material is being released to a foreign country, the transfer of title and custody between duly authorized representatives of the two countries concerned serves to reaffirm the general security understanding already reached with the recipient country and to ensure that the following basic security principles contained therein concerning the protection of classified information are carried out: (1) the information will be safeguarded by the recipient government in substantially the same fashion as information of equivalent classification level is protected by the releasing government; (2) the information will not be released to a third country except with the prior consent of the releasing country; (3) the information will be used for military or other specified purposes only; and (4) patents and other proprietary rights will be honored. Of course, these principles apply equally when the classified material of the foreign country concerned is being released to the U.S. and its contractors. In either case, the government-to-government release channel puts the recipient government on notice when classified material of another country is being released within its country. This enables appropriate steps to be taken by the government of the recipient country to assure that the terms of the security understanding it may have with the releasing country are carried out.

Foreign Contracts to U.S. Firms

With the favorable conditions which currently exist, foreign governments and foreign firms are letting classified contracts and subcontracts to U.S. firms on an increasing and unprecedented scale. The initial point of contact for such procurement is the Director of Industrial Security, HQ DIS.

When precontract discussions between representatives of the foreign government and U.S. firms will involve or is expected to involve disclosure of foreign classified information to the U.S. firm, the foreign government should communicate directly with the Director of Industrial Security, HQ DIS, to:

(a) Obtain information as to the present facility security clearance status of the firm.

(b) Determine the ability of the facility to safeguard properly the classified information.

(c) Request clearance action in those cases in which a facility security clearance of the appropriate level has not been granted.

(d) Ascertain which cognizant security office will exercise supervision over the security aspects of the contract.

(e) Obtain information as to the security clearance of the key personnel with whom they will negotiate.

(f) Request instructions relative to appropriate U.S. Government classified visitor control procedures.

(g) Notify the cognizant security office when discussion between the foreign government or foreign firm will involve release or disclosure of foreign classified information to a U.S. firm.

U.S. Contracts to Foreign Firms

A User Agency may initiate action to award or permit one of its contractors to award a classified contract to a foreign contractor, provided the classified information involved has been approved for release (or is determined to be releasable) to the government of that country under the National Disclosure Policy. In addition, the foreign government concerned must have entered into a security agreement with the U.S. under which it agrees to protect U.S. classified information released to it. The User Agency must also, acting on its own behalf or on behalf of one of its contractors, communicate directly with the designated foreign government to:

(a) Request approval for the placement of prime or subcontracts in the foreign country.

(b) Inform the foreign government of the intention to place a classified procurement with one of its firms and request verification of the level of the foreign firm's facility security clearance level and storage capability.

(c) Arrange for the approval of visits for any U.S. personnel which may be necessary to carry on precontract negotiations leading to the award of a classified contract.

Once the contract has been approved by the foreign government, a number of security procedures prescribed by paragraph 8-104b, ISR must be accomplished by the User Agency. Further, the User Agency is required to inform the Director of Industrial Security, HQ DIS when it authorizes a U.S. contractor to place a U.S. classified contract in a foreign country involving disclosure of U.S. classified information to the foreign country. The Director of Industrial Security, HQ DIS is responsible for providing guidance to the appropriate cognizant security office regarding the U.S. contractor's obligation to properly safeguard any foreign classified information released to them. The U.S. firm's obligation in this regard would be based on an existing bilateral agreement, or otherwise in accordance with instructions received from the foreign government or foreign contractor releasing the information to the U.S. contractor.

Security administration of classified contracts overseas is normally the responsibility of the military department which awarded the contract, and therefore, it is responsible for conducting industrial security inspections overseas. The Army and Air Force perform this function in Europe. Other U.S. activities frequently perform this function outside of Europe, e.g., usually a MAAG in the Middle East.

Storage of Classified Material Overseas

DoD policy requires that U.S. classified material located overseas be stored in U.S. controlled areas. The meaning of "U.S. controlled" has not been uniformly understood or implemented. Usually the meaning is presented in terms of examples, e.g., Defense Attache Offices (DAOs), U.S. embassies or consulates, MAAGS, or U.S. controlled areas of international organizations, such as NATO. The problem is that not all of the foregoing storage sites or locations are in fact under U.S. control. Some are located within foreign commercial office buildings or residential areas. Still others have been known to be located in foreign government controlled buildings. However, as a rule of thumb, all American embassies and consulates should be considered as proper storage sites for classified information.

Similar variances exist in regard to U.S. areas and offices of international organizations. Military guards are utilized in exercising control at the U.S. Mission to NATO (Marine guards), and the U.S. Delegation to NATO (Army Military Police). These controls do not exist for all U.S. office areas at other NATO agencies and activities. However, the problem is not limited to the existence or lack thereof, of formal guard services. Other basic security criteria must also be considered. For example, at some NATO activities there is inadequate physical control of "off the street" and other categories of visitors. There are also cases of inadequate control of NATO uncleared "employees," e.g., auxiliary, support or custodial personnel. The point to remember is that the mere official presence of U.S. activities or NATO activities at a given location is not in and of itself evidence of U.S. control, and storage of U.S. classified material is not necessarily properly safeguarded against compromise. Contractor storage of U.S. classified military information is not authorized overseas.

NATO SECURITY REQUIREMENTS

The minimum NATO security requirements which must be adhered to by all NATO member nations are prescribed within NATO Regulation C-M(55)15(Final).

The U.S. implementation of C-M(55)15(Final) is USSAN[2] Instructions 1-69 and 1-70. USSAN Instruction 1-69 contains instructions for the protection of classified NATO information and material by Departments and Agencies. USSAN Instruction 1-70 prescribes the U.S. implementation of NATO Industrial Security Procedures. Both USSAN Instructions serve as source documents for further U.S. implementation of the minimally required NATO security regulations, e.g., the Industrial Security Regulation; the Industrial Security Manual; and the security documents of the Military Departments. All NATO member nations may impose via their national implementation more stringent NATO security requirements than prescribed by C-M(55)15(Final).

A final personnel security clearance granted by DoD for U.S. citizens is valid for NATO information of the same or lesser security classification provided such individuals have been given an appropriate NATO security briefing. The term "NATO classified information" applies to classified information circulated within and by NATO, including information received from member nations, as well as information originated in the organization itself. However, classified information contributed by a member nation remains the property of the originating nation, even though it is circulated in a document belonging to NATO.

The marking "NATO" on a document is used to signify that the document is the property of NATO. The marking "COSMIC" is also used on NATO documents (TOP SECRET) to signify that it is the property of NATO, and that it is subject to special security controls.

Another marking which may appear on NATO classified documents is the word ATOMAL. ATOMAL information is largely U.S. TOP SECRET, SECRET, and CONFIDENTIAL Restricted Data (RD) and Formerly Restricted Data (FRD) which has been released to NATO. NATO security regulations require that prior to affording access to ATOMAL information, a determination of eligibility for each individual to be given access will be made by a responsible authority of the government of the individual concerned, and that a background investigation must be completed (even at the SECRET level) on individuals other than members of the armed forces or civilian personnel of the military establishments of the NATO member nations. Prior to access, individuals must also be provided an ATOMAL security briefing.

[2]USSAN stands for United States Security Authority, NATO.

15. MODES OF COMMUNICATION

INTRODUCTION

In this final chapter, we return to a more general feature of international programs, and that is the problem of communication given national differences in languages and in patterns of behavior. In this chapter, we cover communications occurring in meetings, negotiation, translation and interpretation, and lessons learned in communication experiences. In addition, because of the importance of information to the Program Manager in such communications, we have included a section on sources of information about foreign weapon systems, economy, technology, and DoD arrangements for international communication.

The success of a cooperative international program depends in a large measure on effective two-way communication and a sharing of information. Poor communication and a lack of relevant data have been blamed in the past for what was actually poor program management. Thus, the complications of differing languages and the variety of available data sources have been used as an excuse for such international program failures. Actually, there is an orderly, systematic manner to tailor reasonable program goals and objectives and to develop the appropriate management organization and structure to meet these goals and objectives. The organization established to accomplish the program management tasks should also assure that effective communications is taking place. Chapter 6 discusses organization and staffing of a multinational program office in detail. Interface/communications management becomes the task of the program manager as requirements are defined.

Once program objectives have been established, the next step is development of a front-end analysis and initiation of the program plan. These involve answering the following basic questions:

- What is the program selling (hardware, training, turnkey plant)?
- To whom is the program selling (subsidiary, government, industry)?
- What is the competition?
- What environment is anticipated?

The program manager must know his customer, understand the customer's economic goals, and know his positions on the subject. The program manager's acquisition strategy must be attuned to the customer; for instance, to consider the use of native subcontractors, whenever possible, and to train nationals for blue-collar, white-collar, and management positions, etc. The PM must understand the thinking, interests, and authority of the customer's representatives. The program manager must be aware of individuals in the customer's organization who may feel threatened by the program plan with loss of prestige, authority, or prospects for advancement.

MEETINGS

Because of distances for travel and differences in time zones and working schedules, meetings assume a special significance in international programs. It may require several days of meeting to reach understandings, because participants must obtain coordinated national positions. Meetings, however, are essential to resolve issues, negotiate licensing agreements and memoranda of understanding, disseminate new information or provide feedback, coordinate specific efforts and obtain participating nations' support, and reconcile conflict. Meetings are an effective means of communication for an international project to gather participants together on matters of mutual interest to produce the following results:

- Integrate project interests.
- Change attitudes, perspective on problems, and national positions.
- Encourage participation in bilateral and international projects.
- Gain information from participants to improve decision-making.
- Obtain commitments of participants to particular courses of action.

Productive meetings are an effective tool for program management communication, in order to develop specific plans and to organize specific tasks. Effective meetings occur as a result of careful planning, meeting leadership, and attention to details. An agenda should be prepared with the meeting objectives in mind, thereby providing the framework to keep the meeting on course. A well-planned agenda will allow the chairman to facilitate interactions of participants. The agenda should focus on issues relating to one topic, if possible, thus requiring fewer attendees and yielding better participation in the discussion. The more concise the agenda the better, as it is difficult for most participants with specific interests to be prepared to discuss a wide variety of issues. Background data should be provided on each issue to ensure that participants understand the issue, and are able to obtain coordinated positions prior to the meeting. Also, the agenda and background data should be provided to the interested parties as early as possible to assure that such a meeting is required.

The two requirements for international meetings over and above the general requirements for other types of meetings are those for handling messages and communications to establish and review positions on issues under negotiation, and also the use of interpreters. The meeting place must have adequate communications to the outside. Equipped meeting rooms are available at international business and trade centers for business negotiations, and at NATO headquarters and national capitals for government-to-government meetings.

To produce an effective meeting, only those with expertise and/or decision-making responsibility should attend. Even so, international meetings will tend to be much slower in operation and, especially if several positions need to be considered for multinational endeavors, quick decisions are not normally to be expected. Time will be required for participants to review previously established positions, with development and/or consideration of new

alternatives. Such delays are inevitable in order to obtain better decision-making on courses of action. An effective meeting can serve as a basis for multinational team building on the way to achieving successful international collaboration.

In meetings or group discussions, it is especially important that certain etiquette and protocol be observed:

- Never browbeat, criticise, or demean any individual in or outside the group. The individual will be undercut and lose face, and you will lose the trust and credibility of the group.

- Learn local national taboos, because some natural behavior in America may be regarded as lack of morality or taste in other countries.

- Be a tough businessman and hard negotiator, but always remember to let the other person "save face" by winning many small issues for his side. The other negotiator will have to show his superiors the results of the negotiation, which may not be endorsed if the outcome is inequitable.

- Precedent is an especially important consideration in international discussion; rely on analysis prior to proposing "innovative and creative" proposals which may become precedents.

- Never make a commitment that hasn't been approved or that you don't have the responsibility and authority to satisfy. Go to meetings with a staffed and approved position on all issues.

- Know the history, educational background, position, and authority of each participant from other governments or their businesses, as well as your own.

- Effective communication starts with a thorough knowledge of our own methods, problems, and requirements. Next, be able to describe future requirements, the time they are needed, and the reasons for them. To assure that these plans are only improved or else substantively unchanged during follow-on discussion, harmonization and agreements are needed on secondary factors and details.

- The leader of the negotiating or other business "teams" should utilize functional specialists available within or through the PM organization, to communicate effectively with the participating personnel on issues outside the leader's area of expertise.

A distinction must be made between public and private sector contract negotiations. The distinction rests primarily on the difference between the public sector concept of sovereign equality and the private sector's economic marketplace orientation. Public sector negotiations between two governments cannot rest only on one government's framework of rules and regulations, but will always involve some mixture or blending of both sets of rules. In public sector negotiations, political considerations are often paramount, while in the private sector, economic considerations usually prevail. Public sector negotiations may involve many more emotional issues, and protocol then becomes

very important. For example, most of the private sector U.S. negotiators have reported that they have had very few language problems in dealing with European firms because all negotiations were conducted in English, and contracts are normally written in English. Although public sector negotiations were frequently conducted in English, a great deal of time was spent preparing and altering translations to produce a bilingual document.

NEGOTIATIONS

Chapter 7 on Contract Management discusses negotiation in the general context of the contracting sequence from program approval to contract award. This Section focuses on specific elements of an international negotiation as they can be affected by communication.

The negotiation process is significantly longer if the foreign firm has not had extensive exposure to U.S. business practices and specifications. Many standard operating procedures identified in the buyer's regular "boiler plate" clauses must be thoroughly discussed with foreign suppliers. American business practices regarding payment, warranties, and liquidated damages also require discussion because treatment of these factors varies from country to country. Normally, the U.S. negotiator must establish the extent to which the foreign supplier previously has complied with applicable U.S. specifications. This requires a detailed step-by-step review of the specifications. Sometimes the foreign supplier's standard specifications meet or exceed the U.S. requirement. However, a very detailed review and comparison is required to ascertain the adequacy of the foreign specifications.

Some other factors that might arise during negotiations with foreign suppliers include letter of credit procedures, default provisions, cancellation limitations, place of jurisdiction, and procedures for resolving disputes. The letter of credit mechanism is quite complex, involves several parties and as many as thirteen steps to complete a single transaction. Specific letter of credit terms and conditions should be negotiated and incorporated into the basic contract, to preclude misunderstandings during contract performance.

Default clauses often have release provisions in case of a force majeure. Since the determination of what constitutes a force majeure varies from country to country, this clause must be carefully worded to protect the purchaser. Cancellation procedures are especially difficult to negctiate with European suppliers because of the latter's inability to adjust the size of his labor force.

The issue of place of jurisdiction is somewhat easier to resolve in dealing with foreign private firms than with foreign government agencies. Since the buyer is paying the bill, and thus providing the money in the transaction, the buyer can usually persuade the seller that legal jurisdiction should remain in the state or country in which the buyer is incorporated. Sometimes, a trade-off takes place because the seller is very concerned about jurisdiction with regard to disputes. Usually, a recognized international arbitration board is designated to resolve such disputes. Negotiation of these points is quite complex, and much interaction with legal counsel is generally needed to avoid an unfavorable arrangement.

Trade-offs are commonplace in almost all negotiations; however, in dealing with foreign suppliers, the quid pro quo concept is especially important. In some countries, the "winner" is thought to be the negotiator who gains the most concessions, regardless of their importance. If the foreign negotiator treats all concessions as equal, the U.S. negotiator should ensure that many issues are introduced. Concessions can be offered or exchanged in an attempt to win big points and yield on little ones. For example, a French supplier might insist on modification of the specification to provide that "MADE IN FRANCE" be etched into the item's casing. If the American negotiator is concerned about the delivery schedule, a very painful liquidated damages clause could be presented in exchange for this minor (but emotional) specification change. When used effectively, both sides feel they have won at the negotiating table. One must always look for emotional issues that might yield valuable concessions on substantive issues. Of course, the skilled U.S. negotiator must fully understand foreign business practices and cultural influences on negotiations, to recognize issues which will yield the best concessions. Since emphasis on these factors and general negotiating techniques vary from country to country, it is important to recognize differences among each country's negotiators.

Finally, a few points seem to apply to U.S. negotiations with all foreign countries. U.S. members must speak slowly if they are to be understood fully. It is important to avoid embarrassing members of the foreign negotiating team. While this might seem obvious, it must be remembered that it is easy to embarrass someone without realizing it, particularly if foreign customs are not understood fully. To minimize misunderstandings, the U.S. negotiator should always use clear, simple language and repeat important points often, using slightly different phraseology each time. Frequent caucuses are especially useful in negotiating overseas because they help to relieve tension.

INTERPRETERS AND TRANSLATORS

In meetings and group discussion, interpreters may be required if participants are not all fluent in the languages used. Even if the participants are familiar with the languages, the interpreter can catch dialects and meanings not always apparent to all participants, and give participants time to think before answering. Interpreters are divided into three levels of proficiency:

- Conference interpreters provide instantaneous, simultaneous translations of conversations.

- Seminar interpreters, almost equally skilled, but not as precise, use chit-chat rather than exact representation.

- Escort interpreters are fluent in the language, but unable to interpret simultaneously with the conversation.

Interpretation is really an artistic performance when done by conference interpreters. Normally, only conference and seminar interpreters are used for meetings. Escort interpreters are used for escort services, when only a one-on-one conversation is expected. If you have employed an interpreter of a higher skill, it is preferable to remain with this higher-skilled interpreter in the event of contingencies, and because of his knowledge in the particular

subject to be discussed. Each interpreter will usually require one study day before the meeting, either at home with study material or at the meeting site with knowledgeable program personnel, to learn the terminology.

Translators can take written work and express it in another language, so that it is scientifically and grammatically correct. If the translation is critical, a reviewer is also necessary to obtain another interpretation, and to smooth out the translated text. Translators (called conference translators) are paid by the day or by the work. Translation takes considerable time because of the research involved; the expert translator normally averages 2,000 words per day. A translating team is usually composed of two translators, one reviewer, and two bilingual typists to balance the workload.

Because most meetings and translations for the DoD program manager require security clearances for the personnel involved, the DoD program manager should use the Language Services Division, Department of State, for contracted services. The Language Services Division is located in the State Department Building, Room 2214, 23rd and C Streets N.W., Washington, D. C. 20520, and can be reached at (202) 632-1102. Their contract personnel can normally provide the type of service required and furnish the contractor's clearance to the cognizant DoD Security Office. They operate on a first-come, first-served basis.

Advance notice is very important when the date is firm. To begin the process, a telephone call is necessary to establish the availability of interpreters and/or translators with the skills and languages on the dates required; in addition, specify the type of conference (legal, technical or political/economic); and establish a firm date. A follow-up letter will be required, stating the above information and providing fiscal data for the contract.

State Department personnel with the requisite skills may be substituted at the same cost to the DoD program manager. The DoD program manager is required to pay the salary for one study date, either on site or at home (interpreter only); travel and work time; and per diem, travel, and a 10 percent State Department overhead. Salaries range from $210 per day for a conference interpreter, to $165 for a seminar interpreter, or $75-$90 per day for an escort interpreter (FY80 stabilized rate). Also, the U.S. Army has an Interpreters/Translators Group located at the U.S. Army Foreign Science and Technology Center: ATTN DRXST-IS4, 220 Seventh St., N.E., Charlottesville, VA 22901; Autovon 274-7487.

The host nation normally provides the interpreters and translators; however, the German Ministry of Defense (MOD) sometimes brings its own. The contract personnel are available also for overseas travel. NATO discussions and documents are normally required only in French and English.

For contractors, "The American Association of Language Specialists (TAALS) is the professional association with language specialists working at international levels, either in conferences or permanent organizations, The association has a membership of about 250 interpreters and translators. They are based in fourteen countries of the Western Hemisphere--Argentina, Brazil, Canada, Chile, Columbia, Guatemala, Mexico, Netherlands, Antilles, Panama, Peru, the United States, Uruguay, Venezuela--and in Europe, Africa, and Japan.

Over 70 of them are permanently employed by international organizations, governmental agencies, and universities; the others work on a free-lance basis. The association vouches for the language competence of its individual members through the rating system in the present Yearbook. The TAALS standards of professional ethics and working conditions are binding on its members everywhere.[1]"

It should be remembered, however, that for security reasons, contractors should consider hiring their own translators and interpreters with security clearances if working on classified contracts with multinational implications. To illustrate the magnitude of the problem, the ROLAND program required the translation of more than 140,000 drawings, specifications, and other data items from French and German to English. The quantity and quality of the translation effort required were matters of such concern that the contractor undertook a study of alternative methods (including the preparation of a large technical dictionary) to arrive at the best solution. Excellent results were achieved and the translation problem was brought under control.

EXAMPLES OF COMMUNICATIONS LESSONS LEARNED

This chapter has thus far considered such specific elements in communication as meetings, translation and interpretation, and negotiation. To broaden the concept of communication further, we present a series of lessons learned in international programs that reinforce the necessity for the program manager to proceed carefully from a statement of requirements to a well-developed plan of operation so that communication will be facilitated. Given the added complexity of international programs both in execution and communication, the basics of good management become even more imperative.

The following lessons learned represent typical approaches or procedures useful in managing an international program:

- Many business arrangements are based on requests for equipment from specified manufacturers or services from specified sources. This totally negates the DoD's or the U.S. company's ability to compete the contracts. Information to foreign customers should emphasize benefits derived through competition, such as more advantageous prices, types of contracts and contract terms, and more favorable delivery schedules. Wherever possible, requests should specify equipment capability or type of service and encourage competition between known qualified sources. Schedules should also incorporate necessary contracting administrative lead times for competition.

- Foreign customers may require concurrent development/production programs to gain the advantage of earliest possible delivery. In doing so, be aware of possible qualification, production, and engineering change/retrofit costs due to early design freezes and release of necessary production parts to meet production schedules. Concurrent development/production should be used only when earliest possible delivery is the primary factor. In such cases, the customer should be

[1] The American Association of Language Specialists (TAALS) 1980 Yearbook, Suite 9, 1000 Connecticut Avenue, N.W. Washington, D.C. 20036, (202) 298-6500.

formally appraised of the resultant high risk in costs for qualification, production, and engineering change requirements.

- Any business arrangement should clearly define what warranty, if any, is to be provided or sought from the contractor and the associated costs; what liability insurance, if any, is included; and specifically who is liable for damages and loss of equipment or life. This is especially important if U.S. Government or contractor personnel are to operate and maintain the equipment as in a training or teaching mode, and for replacement of equipment severely damaged due to materiel failure (i.e., crash-damaged aircraft).

- Responding to a sense of urgency to complete international business arrangements, programs are frequently entered with general statements of work, but without program plans to define specific tasks and milestone schedules, contractor and customer personnel requirements, equipment and facilities requirements, etc. As a result, early efforts normally lack direction and cohesion. Sufficient planning is extremely important in international programs before implementation.

- Business arrangements normally identify the obligation of the customer nation or business to provide facilities, equipment, personnel, supplies, waivers of local taxes (if applicable), visas, and work permits, but in very general terms. Specific types of equipment, facilities specifications, quantities of personnel, and availability/input schedules for those personnel also must be provided. Operating supply programs can be simplified by specifying in the service contracts that the program manager can fund the purchase of items required, without requiring a case-by-case approval by him or his representative in-country. The business arrangement should clearly state that if customer obligations are not met, the program manager will provide the necessary support, to include lease of facilities when appropriate. This portion of the business arrangement also must be funded appropriately.

- In an effort to have spare parts, special tools, etc., available for concurrent delivery with the end item, most support items are released using production-based estimates of budgetary cost and delivery schedules. The actual prices may vary considerably from budgetary estimates, and delivery times of support items are difficult to program accurately because the schedules are estimated. Firm prices or, as a minimum, "not to exceed" prices and firm delivery schedules, should be established for support items prior to their release. This same philosophy should apply to technical manuals covering such areas as preparation times, cut-off dates for changes, printing schedules, and costs.

- Negotiation of major hardware and service contracts, and statements of work should be accomplished at the location of contract performance. This substantially improves customer participation and allows functional managers and on-site administrative personnel to be available immediately for consultation and participation. The on-site negotiating process significantly improves the integrity of the statement of work.

- The procedures of DoD-STD-480A, Configuration Control, are normally incorporated into DoD hardware contracts. MIL-STD-480 should continue to be applied but, in addition, hardware contracts should define explicitly engineering change proposal (ECP) formats and data to be included. The hardware developer should be required to impose configuration control requirements on vendors and update periodically the program manager and his technical representatives on status. The PM and his staff should have access to vendor ECPs and periodically review prime contractor and vendor performance in configuration control of vendor items. The PM should also chair the Configuration Control Board.

- The program manager should institute a quarterly review procedure of hardware, training, and support contracts. At each review, which PM personnel and customer representatives should attend, the prime contractors and major vendors should be required to present a status update. This mechanism has proven extremely successful in surfacing problems, identifying action elements and actions required, and tracking program progress. This review procedure serves as a very effective motivational tool.

- The program manager or his representative operating in foreign countries should be given local procurement authority ($50K-$100K) for necessary supplies and services to support the office operation. The program manager's office in an overseas location should not become dependent on the prime contractor or the customer for this support.

- Shortly after initiating an international program, a dictionary of words and terminology should be initiated. Agreement on definition of commonly used terms is necessary and will pay dividends in improved understanding and better communications. Once agreement is reached, these terms should be used in communications, rather than synonyms or other expressions with the same, or nearly the same, meaning. Slang should be avoided for the same reason. Glossaries of Terms are available from the North Atlantic Treaty Organization as a start on a dictionary of terms for the program.[2]

SOURCES OF DATA

The major commands and PMs implementing or about to be involved in NATO collaborative programs have requirements for a wide variety of information relating to foreign weapons systems, the European industrial and technological base, policies and procedures established at OSD and within the Service, etc. These data are necessary if the international research & development and international logistics staffs and the program office are to:

- Implement DoD policies relating to NATO cooperative armaments program.

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[2] Glossary of Terms Used in Connection with Industrial Property by the NATO Working Group on Industrial Property, Brussels, 1975, and Weapon Systems Management Glossary of Terms by the Industrieanlagen - Betriebsgesellschaft mbH (IABG) - Management Division, Ottobrunn, Germany, September 1978.

- Relate to U.S. technology export controls and information security procedures.

- Further U.S. initiatives for standardization and interoperability and for harmonization.

- Provide a comparison of foreign developments and U.S. programs to reduce the potential for duplication and obtain the synergistic effects of all alliance technology development.

- Assist in the development of individual RSI planning documents and MOU provisions by analyzing alternatives.

- Provide a baseline for assessment of U.S./NATO military equipment capabilities and deficiencies.

For example, a project manager may be interested in foreign weapon systems having an impact on his program; whereas, at a headquarters level, the emphasis is on such subjects as the technological posture/capability of a country. The total DoD requirement for foreign data falls into six major categories as follows:

- Technology Assessments: technological posture of different countries.

- Weapon Systems: systems and subsystems developed or programmed for development.

- Industrial Enterprises: character of foreign industries -- strengths and weaknesses.

- Economic Factors: evaluation of economic strength.

- International Agreements: commitments formalized such as DEAs, MOUs, etc.

- Historical Reports of Technology Transfers: refers to a record of FMS, exports, etc.

An illustration of the availability of current data sources with an assessment of each source is included for reference purposes (Appendix E). The listing is not complete, by any means; however, it reflects some of the many sources of data available to DoD personnel. There are other potential sources of foreign data not included in this appendix; these sources would include the following examples:

[redacted]eriodicals/Publications:

a. International Defense Review.

b. Aviation Week and Space Technology.

c. Defense and Foreign Affairs.

d. Europe.

e. CNRS Research.

f. Armed Forces Journal (International).

g. Armada International.

h. NATO's Fifteen Nations.

i. National Defense.

j. Flight International

k. Air et Cosmos

- Foreign Equipment Exhibitions: This source of data involves on-site observations devoted to technical and performance characteristics of selected items of equipment. While it may be difficult to obtain a schedule of such activities, depending upon the items involved, an inquiry may be made through the Office of Defense Cooperation (ODC) to the country involved. To illustrate this method of obtaining foreign data, the FRG "show and tell" of wheeled combat vehicles at Trier, Germany, is a good example. The Paris Air Show is another prime example of revealing defense-type equipment recently developed for the international market.

- Equipment Catalogs: On certain occasions, foreign governments publish catalogs to indicate availability of selected types of equipment and/or components. The most common type of catalog is represented by a document distributed from the United Kingdom. This catalog provides a description of the item, performance characteristics, military applications, options/modifications available and source of additional detailed information.

- Industry Brochures: Another source of foreign data is the publication of industrial brochures designed to market specific products. These brochures normally include a general description, pictures or drawings, capability and a sales promotion on how the equipment can meet the needs of the military service. The question that must be addressed, is how to ensure that an individual is included on the mailing lists to receive these documents. This requires an aggressive approach to determine the following:

  a. Country that possesses this technology.

  b. Names of specific companies (if available).

  c. When practical, arrangements for visits to subject industrial concerns.

  d. Request to industry to be included on mailing lists for subject materials.

  e. Participation in marketing survey programs.

f. Request for assistance from the UN country Office of Defense Cooperation (ODC) to be included on appropriate distribution lists.

g. Review of publications for potential documents.

h. Maintenance of coordination with FMS personnel to obtain sources of foreign data available in brochures.

- Industrial Reports: The Department of Defense (DoD) has utilized many different contractors to survey and publish data involving foreign governments/industry. For example, General Research Corporation (GRC) has completed a (7) seven part study "Arms Exports and Weapons Cooperation in NATO," which includes statistical data useful at various levels within DoD. The aggressive manager of international programs continually watches for such data to determine their usefulness and/or impact on his program. It is doubtful that a summarized shopping list of these reports exists; however, many have found their way into technical libraries or one of the international offices of the individual Services.

- Seminars/Conferences: Both industry and the government sponsor periodic meetings to examine U.S.-foreign relationships, e.g., American Defense Preparedness Association (ADPA). While the majority of topics presented at these meetings involves policies and procedures, they do constitute a forum which permits the exchange of military information and data. In addition, reference material is published (e.g., ADPA, Vol. I and II, "NATO Rationalization, Standardization and Interoperability") by many of these associations which discusses significant NATO programs to demonstrate how international cooperation can be achieved.

- Intelligence Reports: The military community issues intelligence reports that frequently discuss foreign weapon systems and technology. For example, the Army Foreign Science and Technology Center at Charlottesville, Virginia, publishes a bi-weekly Scientific and Technical Intelligence Summary. This document, while somewhat limited in scope, does provide useful information concerning selected foreign weapon systems and technology. The international program manager should be aware of this source of material and submit formal requests for data if they are not available from other sources.

As can be readily determined from this chapter, there is no current systematic effort available to monitor, or assess, weapon systems and technology. The sources of information are widely dispersed among many governmental agencies, and no single attempt is being made to consolidate these data into a usable format. The data systems that do exist (e.g., intelligence community) are inadequate as regards information on friendly nations. This creates a difficult environment for the international program manager to accomplish his responsibilities effectively. However, with an aggressive approach, he can operate successfully within the framework of the current system. This is not to imply that a central data source within DoD is not necessary. There is a need for more information on foreign weapon systems and technology; however, a problem remains on how to obtain these data in a cost-effective manner.

In summary, the international program manager must:

- Be aware of foreign systems and technology.
- Know the foreign alternatives -- (capability - requirements - costs).
- Aggressively seek information from available foreign sources that relates to his program.
- Know the industrial/governmental arena in which he must operate his international program.
- Establish a library of foreign data as it relates to his program.

APPENDIX A
SECTIONS OF AN MOU

This Appendix provides guidance for preparing the separate sections of an MOU. Because of the individual nature of each program, some sections can be combined, deleted, or expanded and divided into several sections, to address adequately the complex issues. Certain sections, such as intellectual property, or finance and security, will require expert advice beyond that covered here. Compatibility of sections is essential, and cross-referencing should be used whenever necessary. Prior agreements and MOUs should be referenced in specific sections where applicable.

- Title page - identifies the document.
  - -- States document is an MOU.
  - -- Identifies participants.
  - -- Gives the subject; and
  - -- any security classification.
- Table of contents - lists sections and annexes by title and page number.
- Section 1 - defines terms, abbreviations, and reference agreements.
  - -- Defines all words and phrases to the extent necessary to ensure a common understanding.
  - -- Defines all abbreviation and acronyms.
  - -- States prior agreements and their effect on the current agreement.
  - -- Gives effect of proposed modifications to referenced prior agreements.
- Section 2 - Introduction and the Basis for the Arrangement--sets out background and introduces the program in summary form.
  - -- Identifies the Participants and, where appropriate, their representatives.
  - -- Gives reasons for execution of the arrangement and benefits to be derived.
  - -- Summarizes background consideration and intentions respecting follow-on activities.
  - -- Sets out general aims of the program; makes reference to RSI, etc.

- Section 3 - Objectives.

  -- Specific objectives and general goals of the Participants, given in a manner to clarify the intent of the Participants and aid in resolution of ambiguities in other sections of the MOU.

- Section 4 - Total Scope of the Project & MOU.

  -- Project divided into successive phases of the periodic armaments planning system (PAPS).

  -- Accomplishments required to pass from one phase to the subsequent phase.

  -- Phase(s) and activities covered by this MOU.

  -- Provisions affecting follow-on activities.

- Section 5 - Basic Management Structure, Interfaces and Administrative Procedures.

  -- Type of management structure: separate, joint or centralized authority.

  -- Organizational structures for handling overall responsibilities for program policy and direction, e.g.: Board of Directors (large programs); Steering Committee (other programs); Closed NATO Project Group (feasibility phase).

  -- Organizational arrangements for exercising responsibility for day-to-day program management e.g.: General Manager heading NATO or other international agency; pilot or lead nation for single country management; Project Director heading a project office (such a project office may be established by separate joint administrative arrangement including provisions for its funding, location, staffing and administrative support); joint national responsibilities, each country being responsible for the performance of its national workshare.

  -- Control of program management office by voting; percentage of financial, personnel, or other contributions; and other considerations.

  -- Other separate but related programs to facilitate information exchange.

  -- Plans to lead to more extensive programs as related projects mature.

  -- Position designation of personnel accomplishing data and technology transfer and liaison (normally national project officers).

-- Report requirements, data to be exchanged, procedures, languages to be used, and frequency of reports.

-- Joint management plan, coordination, and cooperation.

-- Managerial involvement by industry.

-- Management committee: voting members from each Participant; selection of the chairman; meeting procedures, frequency, and locations; voting procedures and percentage of vote required for approval; and direct liaison between committee members and designated representatives.

-- Steering committee member/project officer responsibility and authority in conducting design reviews and assisting in design analysis; development and review of test planning and participation in the test and evaluation; approval of budget and payment schedules; coordination of visit and access requests; consideration of amendments/modifications of the MOU; coordination of documentation exchange; notification of cost, schedule, and performance degradations; and all other duties in administering his country's responsibilities to the project.

-- Industrial organization: framework of any industrial structure appropriate to secure the objectives of the program should be recognized and provisions included as necessary: relationship of Industrial Organization to Participants (e.g. governments), prime contractor (leader, follower), contractor (consortium), and subcontractors.

- Section 6 - Schedule of Work.

-- Project management objectives to guide and set milestones for program progress.

-- Dates for identifiable work packages with work breakdown structure portrayed in the annexes, if a complex program.

-- Specified levels of management approval for schedule, performance, and cost changes.

- Section 7 - Work Sharing.

-- Definition of the principles governing allocation of work to be performed under the MOU.

-- Division of the future efforts in subsequent phases as expressed in Section 5.

-- Factors affecting work sharing: technological requirements of the program, including standardization and interoperability requirements; technical capabilities of the participants; prospective requirements of the participants; financial contributions by participants, and other contributions by participants (e.g. government services and facilities).

-- Decision on present work-sharing percentage normally in proportion to the financial contribution, whether prior work is to be included in these percentages, and whether subcontracting is an approved method of work sharing.

-- Designation of approval authority for the work-sharing plan.

-- Statement of third-party sales work-sharing percentages.

-- Consultation with industrial interests.

-- Monitoring work sharing plan including adjustment of any imbalance occuring during program, and provisions for logistics support.

-- Provisions for coproduction.

-- Provisions for logistic support as appropriate.

- Section 8 - Funding and Allocation of Costs.

-- Develop guidelines for the determination and reimbursement of costs.

-- Determine the basic financial arrangement; specify each Participant's financial contributions, noting any relevant constraints.

-- Establish mechanism for accumulation and disbursement of funds with specification of the method of collection, collection on demand or payment schedules, and establishment of project trust fund.

-- Designate and authorize individuals to draw funds.

-- State amounts in specific monetary units, provisions for currency fluctuations, and adjustment schedules to share equitable gain or loss caused by fluctuations.

-- Specify permitted costs such as those incurred prior to MOU, contractual agreements, overhead costs, and other allowable costs.

-- Specify unallowable costs including costs prohibited by national laws.

-- Establish project budget function, specify frequency of budgeting responsibility for budget formulation and approval, and state reporting requirements.

-- Establish a fiscal baseline and fiscal year.

-- Provide for nonavailability of appropriated funds, loan provisions, etc.

-- Set appropriate cost milestones and thresholds for the project.

-- Designate an index of the ceiling price for inflation.

-- Establish procedures for allocating cost overruns, notices, and substantiation responsibilities for revised efforts and approval authority at each level of management for cost overruns.

-- Establish procedures for adjusting contributions and cancellation charges of the parties.

-- Provide procedures for the actual currency exchange and transfer.

-- State auditing and accounting procedures to be followed, and designate responsibility for maintaining records of costs and obligations incurred, monies received and disbursed, issuance of auditing reports.

-- Establish notice requirements for audits and who has the right to audit program and contractor records.

- Section 9 - Intellectual Property (IP).

-- Provide clear definition of the rights and responsibilities of the parties and the mechanism for monitoring the intent of this section.

-- Develop disclosure provisions and mechanisms for project-generated, government/contractor-owned, and third-party IP.

-- Develop provisions and mechanisms for protection of owner's rights in IP, liability incurred for misuse and dispute resolution.

-- Specify the type, requirements, and procedures for disclosure of IP.

-- State the authorized and unauthorized use of IP.

-- Develop guidelines to control disclosed IP, consent requirements, marking, and restrictive legends.

-- Provide for obtaining patents covering previous work, both under patent and pending.

-- Provide for IP covering exchanges prior to this MOU.

-- Provide provisions for use of IP in subsequent MOUs.

-- Stipulate specific licensing agreements and financial terms of the IP rights transfer.

-- Develop policy governing determination of accountability and liability in disputes from IP misuse by the government, and designated contractor, and third parties; procedures for resolution; and policy and procedures for compensating damaged parties.

- Section 10 - Standardization and Configuration Control.

  -- Level of standardization/interoperability required.

  -- Provide for configuration control.

  -- Recognize applicable STANAGS.

  -- Stipulate the procedures and organization for managing changes, and level of standardization desired by the Participants.

- Section 11 - Exchange of Personnel and Access.

  -- Stipulate the extent of personnel exchanges and transfer by numbers of personnel, schedule, responsibility for costs and liability for damages, restrictions on use of IP disclosed by exchange personnel, and rights of individuals to inventions and technical data from work performed by exchange personnel.

  -- State those personnel authorized access, security clearance required, facilities to which access granted, type of authorizations granted, noninterference requirements, and procedures for attaining access.

- Section 12 - Protection of Classified Material.

  -- Establish classification procedures, authority for classification of documents, and reclassification review intervals.

  -- Devise method and highest degree of classified material to be exchanged including appropriate handling, storage, and transmittal procedures for classified information and material.

  -- Make reference to appropriate security agreement, i.e. General Security of Information Agreement (GSOIA) or Industrial Security Agreement.[1]

  -- Drafter's attention is drawn to NATO document CM(55) 15 Final, as supplemented.

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[1]The Office of the Director of Information Security, ODUSDP is the office of record for bilateral security agreements and may be consulted when developing this section.

- Section 13 - Sales and Transfers of Property

  -- Develop principles affecting sales price and procedures for approving sales and transfers based upon MOU participants, NATO, MOU non-Participants, and non-NATO countries, and factors entering into price setting such as recoupment of R&D costs and other pricing considerations.

  -- State IP restrictions to sales.

  -- Establish marketing provisions.

- Section 14 - Admission of Additional Participants.

  This section covers:

  -- procedures for admission;

  -- impact on the program;

  -- terms and conditions for admission; and

  -- effects on work sharing and cost sharing.

- Section 15 - General Disclosure of Information to Third Parties.

  -- Specify general, releasable project information, responsibility for release determination, and acceptable forums (NATO organizations, press release, etc.).

  -- State that IP and security information are covered separately in sections 9 and 12, respectively.

- Section 16 - Taxes, Duties and Other Charges.

  -- State those materials and personnel property exempt from taxation, those personnel exempt from taxes, and charges to be paid by the government that imposes them.

  -- State taxes specifically not waived or not paid by the government imposing them.

- Section 17 - Management of Assets

  -- This section applies to such assets including among others: special tooling and test equipment, models or prototypes, and facilities.

  -- State items to be covered, procedures for disposition, mechanism for decision on disposition; provide for continued use and maintenance, and define rights of parties maintaining possession of the equipment after disposition.

-- Stipulate liability of the parties for loss or destruction of the equipment, personal injury, or failure to dispose properly of equipment in its possession, and implications for program cost.

- Section 18 - Inspection and Quality Assurance (See NATO STANAGS 4107 & 4108).

  -- Establish responsibility of each party to formulate and maintain quality control/inspection plans and procedures.

  -- Designate source and approving authority of criteria and develop procedures for nonconformant materials.

  -- State the right of the other parties to observe inspections and conduct additional ones; determine bearer of costs of inspection and nonconformant materials.

  -- Implications for program cost.

- Section 19 - Report Requirements.

  -- Stipulate the reports required, frequency of reporting, preparation and review responsibilities, copies and distribution, availability to nonparticipants, official language, use of restrictive markings on security and IP information, and security classification of these documents.

- Section 20 - Contractual Arrangements for Implementing the MOU.

  This section should contain provisions as to:

  -- by whom contracts are to be placed;

  -- on whom contracts can be placed;

  -- nature of contracts;

  -- governing law(s) concerning contract(s);

  -- administration of contracts, including responsibilities for administrative costs incurred thereby;

  -- special contract provisions presented to the program;

  -- any constraints due to international and national purchasing laws, regulations, practices or policies, and authorities (technical, design, etc.);

  -- contract liability within program entities, participating parties, and other legal entities.

- Section 21 - Logistic Support.

  As far as practicable, provisions should be made at the outset which anticipate the requirements of in-service phases including:

  -- supply and stockholding of spare parts;

  -- provisions for repair and overhaul;

  -- preparation and control of modifications;

  -- supply and availability of documentation;

  -- any training arrangements; and

  -- responsibility for funding Logistic Support.

- Section 22 - Settlement of Disputes

  This section provides for the orderly handling and resolution of disputes and should provide for:

  -- managerial committees' responsibilities;

  -- policies and procedures; and

  -- any limitations on recommendations referred to Participants, referral to NATO committees, and referral to others.

- Section 23 - Insurance, Liability and Indemnity.

  This Section provides for:

  -- liabilities of the Participants (governmental and industrial personnel);

  -- insurance/indemnity arrangements against the risks of loss; and

  -- scope of any indemnities.

- Section 24 - Duration, Amendment, Official Language, and Effective Date of the Agreement.

  -- Establish procedures for amending/modifying/terminating the MOU, including who may submit an amendment, notice requirements, required time period, voting requirements, and time before an amendment becomes effective.

     Specify policy for determination of types of changes requiring formal amendment of the MOU.

  -- State responsibilities of withdrawing party for protection of classified information and IP, use of project facilities in the withdrawing country, financial termination charges and work

responsibilities, and rights to IP vested in the withdrawing party.

-- State procedures for multilateral termination (see above).

-- Provide for settlement of claims arising from withdrawal or termination.

-- Provide for automatic termination/continued approval of the MOU at specific future dates, unless reaffirmed/cancelled by the parties.

-- State governing language.

-- Stipulate circumstances making the MOU effective, such as national ratification or appropriation of funds.

-- State distribution of authentic copies of MOU.

-- State signatures required.

This description of Sections in an MOU is based on Working Papers of the NATO Intellectual Property and International Cooperative Arrangements Group AC/259-D/848 (AC/94-D/290), Subj.: Guidance for the Drafting of MOUs and International Cooperative Arrangements, dated 10 December 1980; and Memorandum of Understanding Guidance Chapters, prepared in Canadian Ministry of Defense, August 1980.

APPENDIX C

RATIONALIZATION, STANDARDIZATION, INTEROPERABILITY (RSI) PLAN OUTLINE

This Appendix contains a draft outline of a possible RSI plan prepared for dissemination within the Army. Its context is a project still early in the acquisition cycle (i.e., immediately following Milestone Zero). It may also prove helpful to managers of projects which have matured beyond this stage, perhaps even into production and transition to the operating forces.

I. Executive Summary

Background of program

RSI opportunities/investigations

Recommended RSI course of action and rationale therefor

Summary of RSI Plan contents

II. U.S. Army Program

Description and operation of system

- Interface with other systems

Salient points of Materiel Need

Evolution of program and current status

Compatibility with NATO/ABCA[1] approved threat and need

- NATO/ABCA involvement in forerunner programs

- Applicable NATO Standardization Agreements (STANAGs) and Quadripartite Standardization Agreements (QSTAGs) (Compliance or rationale for non-compliance should be addressed)

- Potential for NATO/ABCA use

- Potential for use by other Allied Nations

Navy/Marine Corps/Air Force requirements for system

Schedule of present program and risks

[1] America, Britain, Canada, and Australia.

Logistic Support Structure

- Potential for cooperative support

- Degree of dependence on non-standard support system

Potential for interoperability - standardization

Management concept

III. Foreign Programs

Technology/materiel programs closely related/parallel to U.S. Army program

- Analysis of each and potential for cooperation

- Status/schedule of each

- Potential for use by other Allied Nations

- Applicable STANAGs/QSTAGs

- Logistic Support aspects and potential for cooperation

- Test performance data and verification

IV. RSI Documents/Activity (This is considered a key section of the plan since it is the action oriented section)

Previous Guidance/Decisions/MOU

Activities, past and present, aimed at achieving standardization and interoperability within this project.

- Army

- Other U.S. forces

- International

V. Assessment of RSI Alternatives

(This section is vital and must logically develop essential information elements leading to the Program/Project Manager's recommendation. It should include, but is not limited to, the areas listed below)

System RSI Acquisition Alternatives

- Cooperative Development

- Co-production

- Dual Production

- Direct Acquisition

- Foreign Military Sales

- Cooperative Logistics

Acquisition and Logistical Support Strategies

Advantages and Disadvantages of Acquisition and Logistic Support Alternatives in Consideration of following:

- Impact on Cost

- Impact on Army budgeting

- Impact on system scheduling and combat force readiness

- Management structure(s) required

- Metrication Impact

- Security Assessment

- Risk Assessment

- Release of technical information

- Environmental Impact

- Technical data transfer

- Proprietary items/Patent Rights/Licensing Agreements

- Product Improvement

- Production Base

- Configuration Control

- Test and Evaluation

- Offset Agreement requirements

- Third country sales

VI. Recommendations

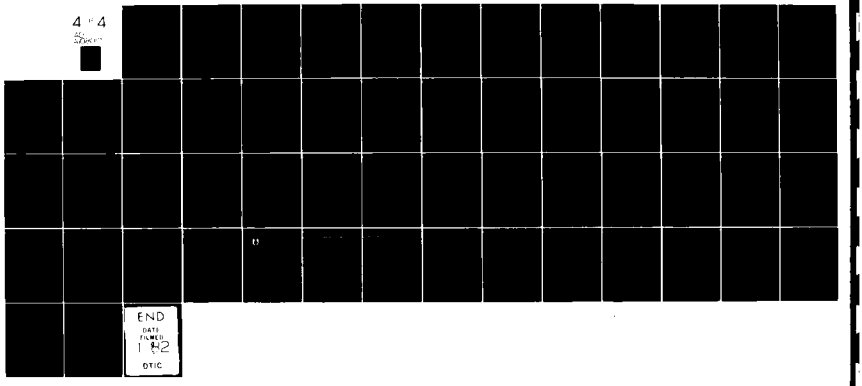
- Concept of implementation

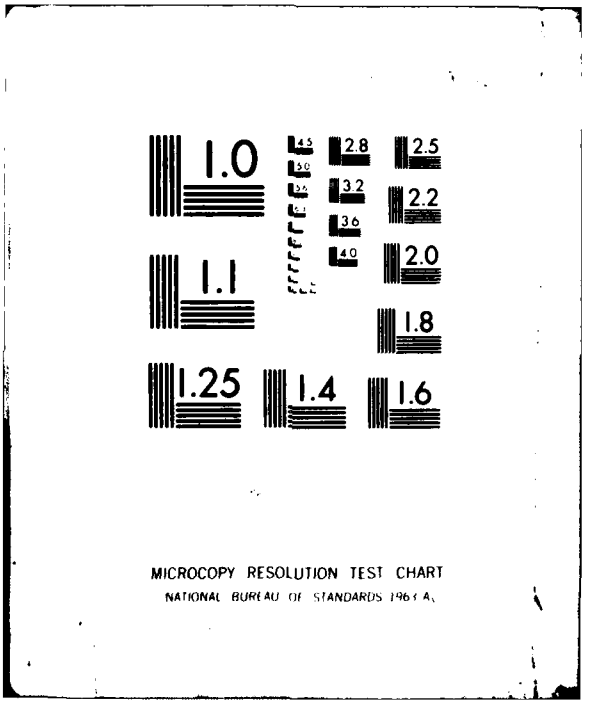
- Schedule

- Management structure and responsibilities for implementation

- Additional MOU required

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JOINT LOGISTICS COMMANDERS GUIDE FOR THE MANAGEMENT OF MULTINAT--ETC(U)
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MICROCOPY RESOLUTION TEST CHART
NATIONAL BUREAU OF STANDARDS 1961 A

APPENDIX D
INITIAL MILITARILY CRITICAL TECHNOLOGIES LIST

This appendix provides the index for the above-named list. It has been prepared in accordance with the provision of the Export Administration Act of 1979. The initial list was developed by DoD, with the cooperation of other government agencies and industry. It is intended to serve as a guide to assist officials who exercise licensing responsibilities under the Act, as discussed further in Chapter 9 of this guide. As experience is gained in its use, changes to this list can be expected.

1.0 COMPUTER NETWORKS TECHNOLOGY

1.1 Network Architecture
1.2 Implementation Technologies

2.0 COMPUTER TECHNOLOGY

2.1 System Architecture Technology
2.1.1 General System Architecture Technology
2.1.2 Processor Architecture Technology
2.1.3 Memory Hierarchy Technology
2.2 Systems Hardware Development and Production Technology
2.2.1 Computer Hardware Development Technology
2.2.2 Computer Hardware Production Technology
2.2.3 Computer Manufacturing Control System (CMCS) and Computer Assisted Manufacturing (CAM) Technology
2.2.4 Interconnections Technology
2.2.5 Production Testing Technology
2.2.6 Computer Cooling Technology
2.2.7 Power Supply and Distribution
2.3 Digital Computer System Utilization Technology
2.3.1 Computer-Assisted Servicing (CAS) Technology
2.3.2 Computer Systems Configuration Management Technology
2.3.3 Digital Computer Security Technology
2.3.4 Computer-Assisted Training/Simulation Technology
2.4 Logic and High-Speed Memory Assembly Technology
2.4.1 Semiconductor Logic and Memory Assembly Technology

2.4.2 Magnetic Core Memory Technology
2.4.3 Josephson Junction Technology
2.4.4 Charge-Coupled Device (CCD) Memory Technology
2.4.5 Magnetic Bubble Logic and Memory Technology
2.4.6 Magnetic Cross-Tie Memory Technology
2.4.7 Plated-Wire Memory Technology
2.4.8 Microprocessor Technology
2.5 Storage Technology
2.5.1 Magnetic Disc Storage
2.5.1.1 Magnetic Disc Read/Write Head Technology
2.5.1.2 Magnetic Disc Recording Media Technology
2.5.1.3 Winchester Disc Technology
2.5.1.4 Flexible Disc Drive Technology
2.5.2 Magnetic Tape Storage Technology
2.5.2.1 Conventional Magnetic Tape Drive Technology
2.5.2.2 Cartridge/Cassette Technology
2.5.3 Other Storage Technology
2.5.3.1 Electron Beam Memory
2.5.3.2 Optical Cryogenic Memory Technology
2.5.3.3 Holographic/Laser Memory Technology
2.5.3.4 Video Disc Digital Recording Technology
2.5.3.5 Archival Magnetic Tape Memory Technology
2.6 Digital Computer Display and Peripheral Technology
2.6.1 Alphanumeric and Graphic Terminal Technology
2.6.2 Peripheral Technology
2.6.2.1 Digital Flat-Bed Technology
2.6.2.2 Nonimpact Line Printer Technology
2.7 Analog and Hybrid Computer
2.8 Other Related Technology
2.8.1 Speech Processing Technology
2.8.2 Artificial Intelligence Technology

3.0 SOFTWARE TECHNOLOGY

3.1 Development Environment Technology
3.1.1 Software Life-Cycle Management Technology

3.1.2 Software Library Data Base

3.1.3 Software Development Tool Technology

3.1.4 Formal Methods and Tools for Developing Trusted Software Technology

3.2 Operations and Maintenance

3.2.1 Maintenance of Large Software Product Technology

3.3 Application Software Technology

3.3.1 Secure Software Technology

3.3.2 Large Self-Adapting Software System Technology

4.0 AUTOMATED REAL-TIME CONTROL TECHNOLOGY

4.1 Utilization of Digital Processing Technology

4.2 Analog and Hybrid Computing Technique Technology

4.3 Display Technology

4.4 Related Software Technology

5.0 MATERIALS TECHNOLOGY

5.1 Metals and Alloys Technology

5.1.1 Magnetic and Amorphous Metals Technology

5.1.2 Nickel-Based Alloys Technology

5.1.3 Titanium Alloys Technology

5.1.4 High-Temperature Coatings Technology for Superalloys and Titanium

5.1.5 Niobium (Columbium) Alloys Technology

5.1.6 Molybdenum Alloys Technology

5.1.7 Tungsten Alloys Technology

5.1.8 Casting and Coating Technology of Intricate Hollow Superalloy Shapes

5.1.9 Plasma Spraying Technology

5.1.10 Advanced Powder Metallurgy Technology

5.1.11 Superplastic Forming/Diffusion Bonding (SPF/DB) Technology

5.1.12 Titanium, Nickel, and Iron Aluminides Technology

5.1.13 Superconducting Materials Technology

5.1.14 Pressure Pipe Fittings Technology

5.2 Advanced Composites Technology
5.2.1 Fibers and Filamentary Materials
5.2.2 Filament Winding, Tape Laying, and Interlacing Technology
5.2.3 Advanced Organic Matrix
5.2.4 Metal- and Graphic-Matrix Composites Technology
5.2.5 Ceramics Technology
5.2.8 Superalloy Composites Technology
5.3 Processing and Forming Technologies
5.3.1 Hot Isostatic Pressing (HIP) Technology
5.3.2 High-Temperature Press Technology
5.3.3 Isothermal Rolling Mill Technology
5.3.4 Isothermal Metal Working Technology
5.3.5 High-Temperature Furnace and Coating Unit Technology
5.3.6 Numerically Controlled Machine Tools Technology
5.3.7 Precision Turning Machines Technology
5.3.8 Spin- and Flow-Forming Machines Technology
5.3.9 High Vacuum Technology (Pumps)
5.3.10 Laser Processing Technology
5.3.11 High Performance Welding Technology
5.3.12 Fracture Analysis, Nondestructive Evaluation (NDE), and Control Technology
5.3.13 Test Equipment for Integrated Structural Testing Technology

6.0 DIRECTED ENERGY TECHNOLOGY

6.1 High Energy Laser (HEL Lasers) Technology
6.1.1 High Energy Laser Technology
6.1.2 Mirror and Optical Device Technology
6.1.3 Beam Pointing and Control Technology
6.1.4 Mounting Subsystem Technology
6.1.5 Beam-Targeting Coupling Technology
6.1.6 Beam Propagation Technology
6.2 Particle Beam Technology
6.2.1 High-Current Particle Beam Generation Technology
6.2.1.1 Post-Injection (Particle Beam Accelerator) Technology
6.2.2 Short-Term Energy Generation Subsystem Technology

6.2.3 Beam Propagation Technology

6.2.4 Beam-Target Coupling Technology

6.2.5 Beam Control Subsystem Technology

6.2.6 Beam Neutralization Technology

6.3 Microwave Energy Transmission Technology

7.0 SEMICONDUCTOR AND ELECTRONIC COMPONENT TECHNOLOGY

7.1 Microcircuit Technology

7.1.1 Wafer Preparation

7.1.2 Epitaxy

7.1.3 Oxidation

7.1.4 Maskmaking

7.1.5A Lithography-Resist Processing

7.1.5B Lithography-Wafer Imaging

7.1.6 Selective Removal

7.1.7 Diffusion/Implantation

7.1.8 Thin Film Deposition

7.1.9 Assembly

7.1.10 Testing

7.1.11 Facilities

7.1.12 IC Design

7.1.13 Hybrid Microcircuits

7.1.14 Microwave Microcircuits

7.2 Transistor, Diode, and Thyristor Technology

7.2.1 Discrete Transistors

7.2.2 Diodes

7.2.3 Thyristors

7.3 Detector, Tube, Intensifier, and Cooler Technology

7.3.1 Semiconductor Detectors

7.3.2 Photomultiplier Tubes

7.3.3 Image Intensifiers

7.3.4 Thermoelectric Coolers

7.4 Acoustic Wave Device Technology

7.5 Thin Film Memory Device Technology

7.5.1 Magnetic Bubble Memories

7.5.2 Plated Wire Memories

7.5.3 Cross-Tie Memories

7.6 Passive Component Technology

7.6.1 Ferrite Materials

7.6.2 Boundary Layer Monolithic Ceramic Capacitors

7.6.3 Quartz Crystals

7.6.4 Printed Circuit Boards

7.7 Cryogenic Component Technology

7.7.1 Superconducting Digital Components

7.7.2 Superconducting RF Components

7.7.3 Cryogenic Coolers

7.8 Electronic Material Technology

7.8.1 Bulk Indium Phosphide (InP)

7.8.2 Bulk Gallium Arsenide (GaAs)

7.8.3 Vapor Phase Epitaxy of $In_{1x}Ga_xP_{1\cdot y}As_x$on InP

7.8.4 Lead Lanthamum Zirconium Titanate (PZLT)

7.8.5 Lead Zirconium Titanate ($Pb(Zr,Ti)O_x$,PZT)

7.8.6 MgO (Magnesium Oxide, Periclase)

7.8.7 Thin Film Interference Coatings for Optics and Other Applications by Vacuum Deposition

7.8.8 Sodium and Potassium Halides (NaF, NaCl, KCl, KBr, etc.)

7.8.9 Thallium Bromoidiode ($TIBr_x1_{1x}$,KRS-5)

7.8.10 Dehydrogen Phospates (ADP, KDP, KD P, CD P, CD A, etc.)

7.8.11 Bismuth Silicon Oxide (BSP, $Bi_{12}SiO_{20}$) Bismuth Germanium Oxide (BGO, $Bi_{12}GeO_{20}$)

7.8.12 Polyvalent Binary Fluorides (e.g., BaF_2 CeF_3 LaF_4 ThF_4 ZrF_4)

7.8.13 Yttrofluorides (e.g., $LiYF_4$, $KY_xF_{.0}$, etc.)

7.8.14 Niobates and Tantalates (e.g., $LiNbO_3$, $LiTaO_3$ $KNbO_3$)

7.8.15 Neodymium Laser Hosts (especially YAG (Y_3Al_{x12}), but also including $La_2Be_20_3$, NdP_30_{14} $K_4NdLi_xF_{10}$, etc.)

7.8.16 Lanthanum Chloride Laser Materials ($LaCl_3$: Pr^{3+}, Er^{3+} etc.)

7.8.17 Mercury Cadmium Telluride (bulk and thin films)

7.8.18 Cadmium Telluride Crystals

7.8.19 Lead Telluride (PbTe)

7.8.20 Ipitaxial Lead Tin Telluride and Lead Telluride (PbSnTe and PbTe)

7.8.21 Lead Tin Selenide ($Pb_{1x}SN_xSe$)

7.8.22 Electroptical Materials with the Chalcopywrite Structure

7.8.23 Rate Earth-Transition Metal Permanent Magnets (example: samarium cobalt and substituted samarium cobalt)

7.8.24 Galdolinium Gallium Garnet (GGG) and Substitued GGG as a Substrate for Magnetic Oxide Films (see also Section 7.5)

7.8.25 Materials for Magnetic Bubble Memories (Thin Magnetic Films Grown on Subsrates)

7.8.26 Germanium--High Purity Detector Grade

7.8.27 3" or Greater Diameter Silicon Wafers

7.8.28 Detector Grade Silicon Wafer with Resistivity 10,000-15,000 ohmcm

7.8.29 Indium Doped Extrinsic Silicon Crystals with Indium Concentration of about $10^{17}cm^{-3}$

7.8.30 Silicon on Sapphire (SOS)

7.8.31 Pyrolytic Boron Nitride (PBN)

7.8.32 Gallium Antimonide

7.8.33 Indium Arsenide

7.8.34 Indium Antimonide

8.0 INSTRUMENTATION TECHNOLOGY

8.1 Time-Domain Measurement Technology

8.1.1 Oscilloscope Technology

8.1.2 Time Interval Measuring Technology

8.2 Frequency-Domain Measurement Technology

8.2.1 Radio Spectrum Analyzer Technology

8.2.2 Panoramic and Digital Receiver Technology

8.2.3 Real-Time Spectrum Analyzer Technology

8.2.4 Frequency-Counter Technology

8.3 Frequency Standards and Signal Source Technology

8.3.1 Frequency Standard Technology

8.3.2 Frequency Synthesizer Technology

8.3.3 Signal Generator Technology

8.4 Electrical Parameter and Digital Measuring Technology

8.4.1 Network Analyzer Technology

8.4.2 Digital Voltage Measuring Technology

8.4.3 Microwave Power Meter Technology

8.5 Digital Instrument Technology
8.5.1 Logic Analyzer Technology
8.5.2 Microprocessor Development System Technology
8.5.3 Analog-to-Digital and Digital-to-Analog Converter Technology
8.5.4 Automatic Test Equipment Technology
8.5.5 Digital Storage Oscilloscope and Digitzer Technology
8.6 Recording Technology
8.6.1 Recorder/Reproducer Technology
8.7 Photographic and Optical Measurement Technology
8.7.1 Photographic Interpretation Technology
8.7.2 Laser Rangefinding Technology
8.7.3 Laser Measurement Technology
8.7.4 LIDAR/Laser Radar Technology
8.7.5 Aerial and Streak Camera Technology
8.7.6 High Speed Cinema Recording Technology
8.7.7 Microdensitometer Technology

9.0 TELECOMMUNICATIONS TECHNOLOGY

9.1 Telecommunications Systems Technology
9.1.1 RF Communications Systems Technology
9.1.2 Optical Communications Technology
9.1.3 Acoustic Communications Systems Technology
9.1.4 Space Qualified Telecommunications Equipment Technology
9.2 Switching Technology
9.2.1 Circuit Switching Technology
9.2.2 Message Switching Technology
9.2.3 Packet Switching Technology
9.3 Modems and Multiplexing Technology
9.3.1 Modem Technology
9.3.2 Multiplexing Technology

10.0 COMMUNICATION, NAVIGATION, GUIDANCE, AND CONTROL TECHNOLOGY

10.1 Vehicle Control Technology
10.1.1 Spacecraft Guidance and Control Technology

10.1.1.1 Spacecraft Stabilization Technology
10.1.1.2 Spacecraft Attitude Control
10.1.1.3 Spacecraft Techniques for Space Environmental Effects
10.1.1.4 Satellite Thermal Design Technology
10.1.5 Onboard Sensor Techniques Providing Control Information
10.1.2 Air Vehicle Guidance and Control Technology
10.1.2.1 Remote Control Techniques
10.1.3 Ship Guidance and Control Technology
10.1.3.1 Navigation and Positioning Techniques
10.1.3.2 Techniques for In-Water Speed Measurement and Integration
10.1.4 Submersible Guidance and Control Technology
10.2 Inertial Navigation Systems (INS) and Related Technology
10.2.1 Inertial Navigation Systems Integration Technology
10.2.2 Inertial Gimballed Platform Technology
10.2.3 Inertial Strapdown Systems Technology
10.2.4 Floated Ball-Bearing Gyroscope Technology
10.2.5 Gas Bearing Gyroscope Technology
10.2.6 Flexure Rotor Gyroscope Technology
10.2.7 Ring Laser Gyroscope Technology
10.2.8 Electrostatically Supported Gyroscope Technology
10.2.9 Nuclear Magnetic Resonance Gyroscope Technology
10.2.10 Fiber Optics Gyroscope Technology
10.2.11 Low-Cost Gyroscope Technology
10.2.12 Accelerometer Technology
10.2.13 Autopilot Technology
10.2.14 Test, Calibration and Alignment Technology
10.3 Cooperative Systems for Radio Navigation and Radio Communication Technology
10.3.1 Techniques for Platform Cooperative Radio-Navigation and Radio Direction Finding
10.3.1.1 Radio Signal Conversion Technology
10.3.1.2 Radio Signal Detection and Processing Technology
10.3.1.3 Navigation Computation and Control Technology
10.3.1.4 Systems Integration Technology
10.3.2 Platform Cooperative Radio Communication Technology
10.3.2.1 Radio Signal-to-Noise Enhancement Technology

10.3.2.2 Antenna Matching Over a Multiplicity of User Allocated RF Band Technology

10.3.2.3 Radio Signal Transmitting, Receiving Detection, and Processing Technology

10.3.3 General Avionics/Electronics Systems Technology

10.3.3.1 Utilization of Solid-State Digital Components in System Design Technology

10.3.3.2 System Architecture Technology

10.3.3.3 Ruggedized/Hardened Equipment Technology

10.3.4 Display and Control Interface for Integrated Communication/ Navigation Technology

10.3.4.1 Improved HUD-Holographic Combiner Lens Technology

10.3.4.2 Voice Control Input Technology

11.0 MICROWAVE TECHNOLOGY

11.1 Microwave Tube Technology

11.1.1 Electron Gun and Beam Design

11.1.2 Microwave Circuits

11.1.3 Microwave Tube Assembly

11.2 Microwave Solid-State Device Technology

11.3 High Power Microwave Control Component Technology

11.4 Waveguide and Component Technology

12.0 VEHICULAR TECHNOLOGY

12.1 Aeronautical Vehicle Technology

12.1.1 Laminar Flow Control (LFC)

12.1.2 Airfoil, Helicopter Rotor and Wing Designs (including high lift devices)

12.1.3 Computer-Aided Design and Manufacture (CAD/CAM)

12.1.4 Technologies for Integrating Sensor Subsystems

12.1.5 Control Configured Vehicles

12.1.6 Flight Control and Flight Management

12.1.7 Electromagnetic Hardening Technology

12.1.8 High Contact Ratio, Double-Helical (Herringbone) Gears

12.1.9 High Survivability (Loss of Lubrication) Technology
12.1.10 Advanced Propellers
12.1.11 Advanced Structural Bonding
12.2 Marine Vehicle Technology
12.2.1 Hydrodynamic Design of Advanced Hull Forms
12.2.2 Foil and Foil Structure Design for Advanced Hydrofoils
12.2.3 Lightweight Marine Platform Structure Technology
12.2.4 Technology for Flexible Curtains and Skirts for Air Bubble Supported Platforms
12.2.5 Automated Platform Controls for Hydrofoils and Other High-Speed Marine Vehicles
12.2.6 Polymer Injection Technology for Drag Reduction
12.3 Deep Submergence Vehicle Technology
12.3.1 Manned Submersibles, Untethered
12.3.2 Manned Submersibles, Tethered and Diving Equipment
12.3.3 Unmanned, Tethered and Towed Submersibles
12.3.4 Unmanned, Untethered Vehicles
12.3.5 Syntactic Foam Technology
12.4 Gas Turbine Propulsion for Aeronautical Vehicle Technology
12.4.1 System Configuration, Aerodynamic and Thermodynamic Analysis
12.4.2 Variable Flowpath Technology
12.4.3 Centrifugal Flow Compressor Aerodynamics
12.4.4 Axial Flow Fan and Compressor Aerodynamics
12.4.5 Turbine Technology
12.4.6 Cooler Turbine Technology
12.4.7 Rotating Propulsion System Structures
12.4.8 High DN Rolling Element Bearings
12.4.9 Gas Film Bearing Design
12.4.10 Ceramic Hybrid Bearing Design
12.4.11 Gaspath Sealing Technology
12.4.12 Gaspath Sealing Technology
12.4.13 Coating Technology
12.4.14 Combustor Aerodynamics
12.4.15 Combustion System Structures
12.4.16 Afterburner/Ductburner Aerothermodynamics
12.4.17 Frames, Ducts, and Cases

12.4.18 Propulsion System Integration Technology
12.4.19 Electronic Control Technology and Diagnostics
12.4.20 Sensors, Actuators, Interfaces, and Interconnections for Advanced Engine Control Systems
12.4.21 Fuel Pumps
12.4.22 Electrical Power Generation
12.4.23 Inlet Technology
12.4.24 Nozzles, Thrust Vectoring, and Thrust Reversing Technology
12.4.25 Wind Tunnel and Propulsion Test Cell Technology
12.5 Gas Turbine Propulsion for Marine Vehicle Technology
12.5.1 Gas Turbine Engine Moisture and Particulate Separator Systems
12.5.2 Protective Coating Technology for Marine Gas Turbine Engines
12.5.3 Technology for Heavy Fuel Capability for Marine Gas Turbine Engines
12.5.4 High Temperature Heat Exchanger Technology
12.5.5 Lightweight Combined Gas and Steam Turbine (COGAS) Systems
12.6 Other Marine Propulsion Technology
12.6.1 Composite Shafting
12.6.2 Lightweight Gearing
12.6.3 Water-Cooled and Superconducting Electrical Machinery
12.6.4 Ship Propellers
12.6.5 Advanced Lift Fans
12.6.6 Large Advanced Waterjets
12.7 Energy Generation, Conversion and Storage Technology
12.7.1 Photo Voltaic Cells
12.7.2 Radioactive Thermoelectric and Thermoinic Generators
12.7.3 Fuel Cells
12.7.4 Aerospace Quality Nickel-Cadium and Nickel Hydrogen Batteries
12.7.5 Special Purpose Primary and Reserve Batteries
12.7.6 Lithium Primary and Secondary Batteries
12.7.7 High Energy Density--High Temperature Secondary Batteries
12.7.8 Power Conditioning
12.7.9 Advanced Flywheels for Energy Storage

13.0 OPTICAL AND LASER TECHNOLOGY

13.1 Fiber Optic Technology
13.1.1 Fiber Technology
13.1.2 Fiber Optic Cable Technology
13.1.3 Source and Detector Technology
13.1.4 Fiber Optic Connecting and Splicing Technology
13.1.5 Optical Coupler Technology
13.2 Integrated Optic Technology
13.3 Filter Technology
13.4 Mirror and Surface Technology
13.5 Dye Laser Technology
13.6 Gas Laser Technology
13.7 Semiconductor Laser Technology
13.8 Solid-State Laser Technology
13.9 Chemical Laser Technology

14.0 SENSOR TECHNOLOGY

14.1 Infrared, Optical and UV Sensor Technology
14.2 Passive X-Ray Sensor Technology
14.3 Conventional Acoustic Sensor Technology
14.4 Fiber Optic Sensor System Technology
14.5 Magnetometer and Magnetic Sensor Technology
14.6 Gravity Meter Technology
14.7 Radar and Related Technology
14.7.1 Systems Architecture, Design and Integration Technology
14.7.2 Transmitter Technology
14.7.3 Advance Radar Antenna Design Technology
14.7.4 Radar Receiver Technology
14.7.5 Signal Processing Technology
14.7.6 Display Technology
14.7.7 Radar Absorbing Material Technology

15.0 UNDERSEA SYSTEMS TECHNOLOGY

15.1 Undersea Acoustic Technology
15.1.1 Acoustic Propagation, Modeling, and Forecasting Technology
15.1.2 Acoustic Reception Technology
15.1.3 Acoustic Transmission Technology
15.1.4 Acoustic Display Technology
15.2 Platform Acoustic Technology
15.3 Heavy Lift Salvage Technology
15.4 Deep Sea Sensor Implantation Technology
15.5 Research Facility Technology

16.0 CHEMICAL TECHNOLOGY

16.1 Polymeric Material Technology
16.2 Hydraulic Fluid Technology
16.3 Synthetic Lubricating Oil and Grease Technology
16.4 Synthetic Elastomer Technology
16.5 Atmospheric Purification Technology

17.0 NUCLEAR SPECIFIC TECHNOLOGY
(Draft being put into final form with the Department of Energy for later publication)

Source: U.S. Department of Defense, "Initial Militarily Critical Technologies List," Washington, D.C.: Federal Register, Vol. 45, No. 192, Oct. 1, 1980.

APPENDIX E
SUMMARY ASSESSMENT OF DATA SOURCES

This appendix contains an assessment of significant data sources that the program manager will find useful in his management of an international program. As indicated in Chapter 15, Communication and Information, there is no integrated collection of such data, but rather they are scattered in many places. Useful data sources include those that are identified in the chapter, in this appendix, as well as others that a program manager may have to find for himself.

FIGURE E-1. SUMMARY ASSESSMENT OF DATA SOURCES

DATA SOURCE	CONTENT	DATA FORMAT	ASSESSMENT	CONTACT
CIA (Central Intelligence Agency/Office of Economic Research)	National economics	REP	Limited to communist countries, mostly USSR and PRC. Performs analysis of statistical data.	CIA (202)351-6532
Commerce Dept./Office of Export Administration	Commercial technological exports (electronics, computers, capital goods)	FIL	Technical assessment performed. Foreign availability considered. Data not easily retrievable.	Commerce (202)377-2118
Commercial Data Bases, Smithsonian Institution (e.g., N.Y. Times, Lockheed, SDC)	Broad spectrum - news, finances, trade, technical data.	COM	Limited foreign coverage. Unclassified data only. On-line terminal access.	Smithsonian (202)381-4211 Ext. 309
CRIC (Central Reference Information and Control), U.S. Air Force	Foreign threat, scientific & technology intelligence reference control.	COM	Unanalyzed raw intelligence. Incomplete data (index only). Cumbersome to use. Must have certified need from Defense Intelligence Agency. Over 5 million references. Very little free world data.	Air Force Foreign Technology Division AV787-3538
DMS (Defense Management Service), Defense Dept.	Foreign military markets. U.S. defense R&D markets. U.S. ongoing and new weapons programs.	REP	No detailed technical data. Limited to program status, funding and performance specifications. No coverage on operational systems.	DMS (703)354-4143
DRI (Data Resources Inc.)	National economic statistics. Computerized national economic models.	COM, REP	Performs quick-response parametric analyses. On-line service available.	DRI (202)862-3700
Defense Systems Management College, NATO/RSI Acquisition Repository	MOUs, NATO RSI, Acquisition Plans, point papers & other documents.	COM, REP & FIL	Access limited to on-site (Ft. Belvoir). Bibliographies & searches are available.	Information Services Center AV354-2900
Energy Dept./Office of International Security Affairs	Energy-related technologies, primarily nuclear.	FIL	Technical assessments performed. Foreign availability considered. Data not easily retrievable.	Energy (202)376-5885
FLITE (Federal Legal Information Through Electronics), Defense Dept.	Data includes all published International Agreements of the United States and unpublished agreements affecting Defense including MOUs; U.S. Code; DAR; CFR; decisions of the federal courts and administrative agencies, including GAO.	COM	Currency varies from more recent than published texts to a few years old, depending upon the data base. DoD International Agreements are approximately one year old. Legal research service and full text copies provided.	FLITE AV926-7531 (303)370-7531
FOMA (Foreign Military Assistance), Defense Dept.	Foreign military assistance agreements. Value and types of weapons and equipments. Data for supplier and recipient countries.	COM, REP	Semi-annual publication. No Order of Battle or U.S. data. U.S. data to be included in future.	DIA AV222-5822
FORDAD (Foreign Disclosure Automated Data), Defense Dept.	Munitions export cases. Classified disclosures to foreign countries.	COM	Historical data base. Difficult to use. Being upgraded. (See Chapter 14 on Disclosure of Military Information.)	OUSDP AV225-7141

DATA SOURCE	CONTENT	DATA FORMAT	ASSESSMENT	CONTACT
FWEP (Foreign Weapons Evaluation Program), Defense Dept.	Foreign weapons test and evaluation.	REP	Nonuniform selection, test and evaluation procedures used by Services.	OUSDRE AV227-4818
IACs (Information Analysis Centers), Naval Research Laboratory	Worldwide technical literature in specific disciplines. Classified U.S. technical data included.	REP, COM	Highly specialized data. Can provide net assessments but generally not performed. Titles and abstracts on computer. Hard copy for full text.	NRL (202)767-2220
IMF (International Monetary Fund)	National economic statistics.	REP	Major data source for AID, U.S. responsible agency for international accounts of Free World countries.	IMF (202)393-6362
Intelligence Products (e.g., Weekly Intelligence Summary), Defense Intelligence Agency	Focus on communist countries and military capabilities - force balances, political developments, armaments and their deployment.	REP	Very little data on Free World weapon systems and technology. Weak subject area correlation among different products.	DIA AV222-9736
International Agreements, Defense Dept.	DEAs, IEP, MOUs	FIL	Process for identifying U.S. data requirements and disseminating foreign technical data is inadequate.	OUSDRE AV224-3203
MILPRO (Military Production), Defense Intelligence Agency	Foreign production rates, capacities and plant size for combat materiel. (Source for FOMA, FOMP, FOAP, etc.)	COM	No data on export share of production. No net assessment of data is performed. No production cost data.	DIA AV222-5074
NASA (National Aeronautics and Space Administration)	Assessments of space technologies. Limited foreign data available.	FIL, REP	Considerable number of space technology assessments that have military relevance.	NASA (202)755-3150
NTIS (National Technical Information Service), Commerce Dept.	Unclassified U.S. Government technical reports and government-owned patents.	REP	Limited coverage of Free World technical information.	NTIS (202)724-3374
OECD (Organization of Economic Cooperation and Development)	National economic statistics and Science and Technology policies for Free World nations.	REP	Economic analysis provided for country comparisons. Non-military emphasis.	OECD (202)298-8755
Services' Overseas R&D Liaison Offices	R&D progress in Free World countries.	FIL, REP	Limited weapon systems coverage. Data not easily retrievable.	AF AV225-2014 Navy AV226-4106 Army AV284-9464
State Dept./Office of East-West Trade	Historical data on Commodity Committee (COCOM) cases. COCOM embargo items.	FIL	Technological assessment data available. Limited foreign availability data. Data not easily retrievable.	(202)632-0964

DATA FORMAT LEGEND: COM - Computerized; FIL - Files; REP - Reports

APPENDIX F
SELECTED REFERENCES

The following list of references, categorized as general references and also by chapter, contains publications used in the preparation of the guide and others related to the material in the guide gathered through a library search. It is of interest that almost all of the references tend to be broad in content, with relatively few containing quantitative information. In addition, there are many DoD and Service directives, instructions, etc. that are applicable and which are mentioned in the guide at relevant places in the text.

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APPENDIX G
GLOSSARY OF ABBREVIATIONS AND DEFINITIONS

This Glossary consists of a list of abbreviations and their meaning used in the guide, and a selection of important definitions related to the content of this guide. The definitions have been drawn from a variety of sources including the Manual on Management of Security Assistance, prepared by the Defense Institute of Security Assistance Management, and material used in the Program Management Course and the Multinational Program Management Course at the Defeuse Systems Management College. The definitions include a new series developed by the Ad Hoc NATO Study Group on PAPS. These are identified by (NATO) at the end of each such definition.

ABBREVIATIONS

AAH	- Advanced Attack Helicopter
ABCA	- America, Britain, Canada, and Australia
ABDR	- Aircraft Battle Damage Repair
ACO	- Administrative Contracting Officer
ACOCS	- Army Customer Order Control System
ACSI	- Assistance Chief of Staff, Intelligence (Army)
ACSM	- Assemblies, Components, Spare Parts and Materials (NATO Standardization Areas)
AECA	- Arms Export Control Act
AFAFC	- USAF Accounting & Finance Center
AFCENT	- Allied Forces Central Europe
AFLC	- Air Force Logistics Command
AFR	- Air Force Regulation
AFSC	- Air Force Systems Command
AGC	- Army General Council
AGS/DS	- Assistant Secretary General for Defense Support, NATO
AIM-9L	- Infrared Air-to-Air Missile
ALCM	- Air Launched Cruise Missile
AMRAAM	- Advanced Mid Range Air-to-Air Missile
AP	- Allied Publication; Acquisition Policy
AQAP	- Allied Quality Assurance Publication
AR	- Army Regulation
AS	- Acquisition Strategy
ASBCA	- Armed Services Board of Contract Appeals
ASCC	- Air Standardization Coordination Committee

ASD	- Assistant Secretary of Defense
ASD(ISA)	- Assistant Secretary of Defense, International Security Affairs
ASG(ILCO)	- Assistant Secretary General for Infrastructure, Logistics, and Council Operations
ASRAAM	- Advanced Short Range Air-to-Air Missile
BE	- Belgium
BOD	- Board of Directors
BPFA	- Bureau de Programme Francais Allemand
CAO	- Contract Administration Office
CAS	- Contract Administration Service; Cost Accounting Standards
CASEUR	- Air Force Contract Administration Services-Europe
CCC	- Canadian Commercial Corporation
C^3I	- Command, Control, Communication, and Intelligence
CCH	- Currency Clearing House
CCL	- Commodity Control List
CCM	- Counter-Counter measures
CEB	- Navy CNO Evaluation Board
CETS	- Contractor Engineering & Technical Services
CFR	- Contractor Furnished Requirements
CFSP	- Contractor Field Services Personnel
CFSR	- Contract Funds Status Report
CIF	- Cost, Insurance, Freight
CINCPAC	- Commander in Chief, Pacific Command
CLSSA	- Cooperative Logistic Supply Support Arrangement
CM	- Configuration Management, Counter Measures
CMS	- Contractor Maintenance Services
CNAD	- Conference of National Armament Directors
COB	- Collocated Operating Base
COMMZ	- Communication Zone
COMSEC	- Communications Security Equipment
C/SCSC	- Cost/Schedule Control Systems Criteria
DA	- Department of Army
DAO	- Defense Attache Office
DAR	- Defense Acquisition Regulation
DARCOM	- Army Materiel Development and Readiness Command
DCAA	- Defense Contract Audit Agency

DCI	- Director, Central Intelligence
DCP	- Decision Coordinating Paper
DCSLOG	- Deputy Chief of Staff, Logistics, Army
DCSRDA	- Deputy Chief of Staff, Research & Development, Army
DDT&E	- Director, Defense Test & Evaluation
DE	- Denmark
DEA	- Data Exchange Agreement
DIA	- Defense Intelligence Agency
DIN	- Deutschland Industrial Norms
DIS	- Defense Investigative Service
DISCO	- Defense Industrial Security Clearance Office
DISCR	- Directorate of Industrial Security Clearance Review Office, OSD
DISI	- Defense Industrial Security Institute
DISP	- Defense Security Industrial Program
DIVAD	- Division Air Defense Gun
DoD	- Department of Defense
DoDD	- DoD Directive
DoDI	- DoD Instruction
DoDISS	- DoD Index of Specifications and Standards
DPC	- Defense Planning Committee (NATO)
DRM	- Drafting Room Manual
DRP	- Direct Requisitioning Procedure
DS	- Direct Support Level of Maintenance
DSAA	- Defense Security Assistance Agency
DSARC	- Defense Systems Acquisition Review Council
DT	- Development Test
DT&E	- Development Test & Evaluation
DTPUC	- Design to Production Unit Cost
DUSDP	- Deputy Undersecretary of Defense for Policy
EEC	- European Economic Community
ECP	- Engineering Change Proposal
ECWG	- Navy Evaluation Coordination Working Group
EEC	- European Economic Community
EMIC	- Electromagnetic Impulse Compatability
ENJJPT	- Euro NATO Joint Jet Pilot Training
ENTEC	- Euro NATO Engineer Courses

EPI	- European Participating Industry
EPG	- European Participating Government
ETSS	- DoD Engineering and Technical Services Specialists
EW	- Electronic Warfare
FAA	- Foreign Assistance Act
FAD	- Force Activity Designator
FAS	- Free Alongside Ship
FMS	- Foreign Military Sales
FMSO	- Foreign Military Sales Order
FOB	- Freight on Board
FORDAD	- Foreign Disclosure Automated Data System
FORDTIS	- Foreign Disclosure and Technical Information System
FR	- France
FRG	- Federal Republic of Germany
FTS	- Field Training Services
FWE	- Foreign Weapons Evaluation
FWE-CNP	- Foreign Weapons Evaluation-Candidate Nomination Proposal
GAO	- General Accounting Office
GE	- Germany
GFE	- Government Furnished Equipment
GFAE	- Government Furnished Accessory Equipment
GR	- Greece
GS	- General Support Level of Maintenance
GSE	- General Support Equipment
GSOIA	- General Security of Information Agreement
HNS	- Host Nation Support
IBOP	- International Balance of Payments
IDL	- Indentured Drawing List
IEPG	- Independent European Programme Group
IFV	- Infantry Fighting Vehicle
I^2	- International Interchangeability
ILRRP	- International Long Range Reconnaissance Patrol
ILS	- Integrated Logistics Support
IOC	- Initial Operating Capability
IP	- Intellectual Property
IP&T	- Intellectual Property and Technology

IEP - International Exchange Program
IEPG - Independent European Programme Group
IPB - Illustrated Parts Breakdown
IPR - Intellectual Property Rights
IPS - Integrated Program Summary
IPT - Intellectual Property Transfer
ISA - International Security Affairs
ISI - Industrial Security International
ISM - Industrial Security Manual
ISR - Industrial Security Regulation
ITAR - International Traffic in Arms Regulations, Dept. of State
JRCC - Joint ROLAND Control Committee
JCCB - Joint Configuration Control Board
JCCC - Joint Configuration Control Committee
JTIDS - Joint Tactical Information Distribution System
LAW - Light Attack Weapon
LDA - Limited Depository Account
LOA - Letter of Acceptance; Letter of Offer and Acceptance
LOC - Lines of Communication
LOGMAP - Logistics Master Plan (US/DoD)
LOGMAPS - NATO Logistics Master Planning System
LRIP - Low Rate Initial Production
LSAR - Logistics Support Analysis Review
LWIR - Long Wave Infrared
MAAG - Military Assistance Advisory Group
MAG - Main Armament Group
MAP - Military Assistance Program
MASM - Military Assistance Sales Manual
MCM - Military Committee Memorandum
MDEL - Major Defense Equipment List
MENS - Mission Element Needs Statement
MICOM - Missile Command
MILSPEC - Military Specifications
MIL-STD - Military Standard
MILSTRIP - Military Standard Requisitioning and Issue Procedures
MIPR - Military Interdepartmental Purchase Requests

MLRS	- Multiple Launch Rocket System
MMOU	- Multilateral MOU
MNC	- Major NATO Commanders
MNCC	- Multinational Coordination Center (NATO)
MND	- Mission Need Document
MOB	- Main Operating Base
MODFLIR	- Forward-Looking Infrared Modules
MOU	- Memorandum of Understanding
MRA&L	- Manpower, Reserve Affairs, and Logistics
NAAG	- NATO Army Armaments Group
NAC	- North Atlantic Council
NADs	- National Armament Directors
NADREPs	- National Armament Directors Representatives
NAFAG	- NATO Air Force Armaments Group
NAMSA	- NATO Maintenance and Supply Agency
NAMSO	- NATO Maintenance and Supply Organization
NAPATMO	- NATO PATRIOT Management Office
NAPMA	- NATO AEW Program Management Agency
NAPMO	- NATO AEW Program Management Organization
NAPR	- NATO Armaments Planning Review
NATO	- North Atlantic Treaty Organization
NATO AEW	- NATO Airborne Early Warning Programme
NATO MC	- NATO Military Committee
NAVMAT	- Naval Materiel Command
NAVSTAG	- Naval Standardization Agreement
NDPC	- National Disclosure Policy Committee
NIAG	- NATO Industrial Advisory Group
NMAS	- National Military Authorities
NE	- Netherlands
NNAG	- NATO Navy Armaments Group
NSA	- National Security Agency
NSSMS	- NATO Sea Sparrow Surface Missile System
NTE	- Not to Exceed
NTFWTC	- NATO Tactical Fighter Weapons Training Center
OGC	- Office of General Council
OISI	- Office of Industrial Security International

OMB	- Office of Management and Budget
OPNAV	- Chief of Naval Operations
OSD	- Office of Secretary of Defense
OT	- Operational Test
OT&E	- Operational Test and Evaluation
OTEA	- Army Operational Test and Evaluation Agency
OUSDRE	- Office of Undersecretary of Defense for Research and Engineering
PAPS	- Periodic Armaments Planning System
P&A	- Price and Availability
PDM	- Program Decision Memoranda
PL	- Public Law
PM	- Program Manager
PMD	- Program Management Directive
PMO	- Program Management Organization
POMCUS	- Prepositioned Material Configured to Unit Sets
PPBS	- Planning, Programming and Budgeting System
PPE	- Preproduction Proposal Evaluation
PTD	- *Provisioning Technical Documentation*
QSTAG	- Quadripartite Standardization Agreement
R&D	- Research and Development
RFP	- Request for Proposal
ROI	- Report of Investigation
RSC	- Reinforcement Support Category (NATO)
RSI	- Rationalization, Standardization, and Interoperability
SAAC	- Security Assistance Accounting Center
SBA	- Small Business Administration
SCEPC	- Senior Civil Emergency Planning Committee
SECNAV	- Secretary of the Navy
S/I	- Standardization/Interoperability
SHINPADS	- Shipboard Integrated Processing and Display System
SISMS	- Standard Integrated Support Management System
SNLC	- Senior NATO Logistics Conference
SOTAS	- Standoff Target Acquisition System
SPO	- System Program Office; Special Project Office
SRAM	- Short Range Air Missile
SSE	- System Support Equipment
STANAG	- Standardization Agreement

TAALS	- American Association of Language Specialists
TDP	- Technical Data Package
TDY	- Temporary Duty
TECOM	- US Army Test and Evaluation Command
TEMP	- Test and Evaluation Master Plan
TIAS	- US Treaties and Other International Agreements Series
TIWG	- Army Test Integration Working Group
TPWG	- Air Force Test Plans Working Group
TRADOC	- US Army Training and Doctrine Command
TSGAD	- Tri-Service Group on Air Defense
TSGCEE	- Tri-Service Group in Communications and Electronics Equipment
TTF&T	- Technology Transfer, Fabrication and Test
UK	- United Kingdom
UND	- Urgency of Need Designator
USAF	- United States Air Force
USDP	- Undersecretary of Defense for Policy
USDRE	- Undersecretary of Defense for Research and Engineering
USDRE(AP)IA	- Directorate of International Acquisition, Deputy Assistant Secretary for Acquisition Policy, Undersecretary of Defense for Research and Engineering
USDRE(IPT)	- Deputy Undersecretary of Defense for Research and Engineering (International Programs and Technology)
USG	- United States Government
USI	- U.S. Industry
USMC	- United States Marine Corps
USN	- United States Navy
USSAN	- United States Security Authority, NATO
WEU	- Western European Union

DEFINITIONS

Acceptance, Letter of Offer. U.S. Department of Defense (DD) Form 1513 Offer and Acceptance by which the U.S. Government offers to sell to a foreign government or international organization defense articles and defense services pursuant to the Arms Export Control Act, as amended. The DD Form 1513 lists the items and/or services, estimated costs, the terms and conditions of sale, and provides for the foreign government's signature to indicate acceptance.

Administrative Contracting Officer (ACO). A government contracting officer, often at an installation other than the one which made the contract, who handles the business administration of the contract.

Arms Export Control Board (AECB). An interagency board, chaired by the Under Secretary of State for Security Assistance, Science and Technology, which serves to advise the Secretary of State on matters relating to security assistance program levels and arms transfer policies.

Arms Transfers. Defense articles and defense services such as arms, ammunition, and implements of war, including components thereof, and the training, manufacturing licenses, technical assistance and technical data related thereto, provided by the government under the Foreign Assistance Act of 1961, as amended; other statutory authority; or directly by commercial firms to foreign countries; foreign private firms, or to international organizations (Executive Order No. 10973, as amended, "Administration of Foreign Assistance and Related Functions").

Asset Use Charge. A charge for the use of USG facilities and equipment. In accordance with DODI 2140.1, an asset use charge is applicable: (1) to FMS orders which require the use of DOD assets in other than facilities for which appropriate rental charges are made under the Use and Charges Clause of the Defense Acquisition Regulation; (2) to materiel provided from USG inventories; (3) to repair/modification of FMS-owned materiel in USG depots; (4) to training at DOD installations; (5) to use of USG-owned transportation assets.

Case. A contractual sales agreement between the U.S. and an eligible foreign country or international organization documented by DD Form 1513. One FMS case identifier is assigned for the purpose of identification, accounting, and data processing for each accepted offer (DD Form 1513).

Codevelopment. A development project to which more than one government contributes effort or resources.

Commercial-Type Items. Any items, including those expended or comsumed in use which, in addition to military use, are used and traded in normal civilian enterprise and which are, or can be, imported/exported through normal international trade channels.

Commonality. A quality which applies to materiel or systems possessing like and interchangeable characteristics enabling each to be utilized or operated and maintained by personnel trained on the others without additional specialized training; or having interchangeable repair parts or components; and applying to consumable items interchangeably equivalent without adjustment.

Compatibility. The characteristic or ability of systems to coexist and function in the same environment without mutual interference.

Configuration Management (CM). CM is a procedure for applying technical and administrative direction and surveillance to (a) identify and document the functional and physical characteristics of an item or system, (b) control any changes to such characteristics and (c) record and report the change, process, and implementation status. The CM process must be carefully tailored to the capacity, size, scope, and phase of the life cycle; nature and complexity of the system involved.

Contract Type. Normally a reference to the pricing terms of the agreement between a buyer and a seller, but may refer to the special nature of other important terms in the agreement. Thus, a contract may be a "fixed price" type.

Contract Work Breakdown Structure (CWBS). The complete WBS for a contract, developed and used by a contractor within the guidelines of MIL-STD 881A, and in accordance with the contract work statement.

Contracting Officer. Any officer or civilian designated with authority to enter into, administer or terminate contracts for the Service.

Contractor. An entity in private industry which enters into contracts with the government. In this guide, the word also applies to Government-operated activities which perform work on major defense programs. KR commonly used abbreviation.

Cooperative Logistics. This term is used to denote the international cooperation among NATO member nations in the logistical support of weapons and other defense systems used in the armed forces involved. It also includes the logistic support provided a foreign government/agency through its participation in the United States Department of Defense logistics system with reimbursement to the U.S. for support provided (JCS Pub 1).

Cooperative Logistics Sales. Sales pursuant to arrangements wherein continuing support is provided a foreign government through its participation in U.S. Department of Defense logistics system, with reimbursement to the U.S. for support performed.

Cooperative Logistics Support Arrangement. The combining term for procedural arrangements (Cooperative logistics arrangements) and implementing procedures (supplementary procedures) which together support, define, or implement cooperative logistics understandings between the United States and a friendly foreign government under peacetime conditions (JCS Pub 1).

Cooperative Projects. (term of reference used in the Arms Export Control Act). A project described in an agreement under which NATO or one or more NATO countries agree to (a) share with the United States the costs of research, development, testing and evaluation (RDT&E) of certain defense articles, and the costs of any agreed joint production ensuing therefrom, in furtherance of NATO standardization and interoperability; or (2) bear the costs of RDT&E of certain defense articles and to have such articles produced for sale to, and licensed for production within, other participant member countries including the United States, and the United States agrees to bear the RDT&E costs of other defense articles and to have such defense articles produced for sale to, and licensed for production within, other participant member countries in order to further the objectives of rationalization of the industrial and technological resources within NATO.

Cooperative Research and Development. Any method by which governments cooperate to make better use of their collective research and development resources to include technical information exchange, harmonizing of requirements, codevelopment, interdependent research and development, and agreement on standards.

Coproduction. Any program based upon a government-to-government agreement whereby the U.S. Government: (1) enables an eligible foreign government, international organization, or designated commercial producer to acquire the technical information and know-how to manufacture or assemble in whole or in part an item of U.S. defense equipment for use in the defense inventory of the foreign government; or (2) acquires from a foreign government international organization, or foreign commercial firm, the technical information to manufacture domestically a foreign weapon system or subsystem for use by the Department of Defense. It includes government-to-government licensed production arrangements. It does not include: (1) overseas or domestic licensed production based on direct commercial arrangements with U.S. contractors in which the U.S. Government is involved solely on the basis of U.S. export or import licensing, or (2) the provision of technical data for maintenance, repair, overhaul, or operation of a defense item, without permission to manufacture the item or its components.

Decision Coordinating Paper (DCP). The principal document to record essential system program information for use in support of the Secretary of Defense decision-making process at Milestones I, II and III.

Defense Articles. Includes any weapons, weapon system, munition, aircraft, vessel, boat, or other implement of war; any property, installation, commodity, material, equipment, supply, or goods used for the purposes of furnishing military assistance or making military sales; any machinery, facility, tool, material, supply, or other item necessary for the manufacture, production, processing, repair, servicing, storage, construction, transportation, operation, or use of any other defense article or any component or part of any articles listed above, but shall not include merchant vessels, major combatant vessels (10 U.S.C 7307), or as defined by the Atomic Energy Act of 1954, as amended (42 U.S.C 2011), source material, by-product material, special nuclear material, production facilities, utilization facilities, or atomic weapons or articles involving Restricted Data. (Sec. 644(d), FAA and Sec. 47(3), AECA).

Defense Automatic Addressing System (DAAS). DAAS functions as an automated system for routing logistics data traffic and provides document processing and data information services. (DODD 4000.25).

Defense Information. Any document, writing, sketch, photograph, plan, model, specification, design prototype, or other recorded or oral information relating to any defense article, defense service, or major combatant vessel (e.g., DE, SS and above), but shall not include Restricted Data as defined by the Atomic Energy Act of 1954, as amended, and data removed from the Restricted Data category under section 142d of that Act. (Sec. 644(e) FAA 61).

Defense Service. Includes any service, test, inspection, repair training, publication, or technical or other assistance, or defense information used for the purpose of furnishing military assistance or FMS but does not include military education and training activities. (Sec. 644(f), FAA and Sec. 47(4), AECA).

Defense System Acquisition Review Council (DSARC). An advisory body to the Secretary of Defense on major system acquisitions. The Council members are the OSD staff principals.

Development Objective. A result to be obtained by a development activity, stated in technological and operational terms. (NATO)

Development Requirement. A development rationale to justify the decision to start the relevant development activity. (NATO)

Dual Production. As used in the NATO context, it is the production of a weapons system in Europe and the United States. The term can refer not only to independent production lines for the entire weapon system, but also to interdependent production whereby the participants produce for one another parts or components of the system.

Eurogroup. A term used for those European nations that have joined (combined) within the North Atlantic Treaty Organization in order to make a greater and better coordinated contribution to the common defense effort and thus strengthen the alliance.

Exclusive (Non-Exclusive) License. A license covering a patent(s), technical or proprietary data, technical assistance, know-how, or any combination of these, granted by a U.S. firm to a foreign firm or government to produce, co-produce or sell a defense article or service within a given sales territory without competition from any other licenses or from the licensor. A non-exclusive license is a license as described above, except that competition may be permitted with other licensees and/or the licensor.

Family of Weapons. A weapons family is composed of related and complementary weapons systems in a particular mission area. For example, systems in an air-to-ground munitions family could be defense suppression, antiarmor, antipersonnel, and airfield attack.

Feasibility Study. A feasibility study is carried out by industry or government agencies or a combination of both with the object of providing a technical appraisal of the feasibility of developing and producing an equipment with the performance required by the NATO Staff Target.

The study identifies areas of technical risk, recommends characteristics of the system(s) and gives the optimum balance between performance, cost and development time. The study also indicates areas where considerable advances on the existing state of knowledge are likely to prove necessary for successful development. It indicates the means by which the recommended solution will be achieved, suggests a programme for project definition, development and production, with a preliminary estimate of the costs for these stages and must result in the establishment of a NATO staff requirement. (NATO)

Five Year Defense Program (FYDP). The official program summarizing the Secretary of Defense's approved plans and programs for the Department of Defense.

Foreign Military Sales. That portion of United States security assistance authorized by the Foreign Assistance Act of 1961, as amended, and the Arms Export Control Act, as amended. This assistance differs from the Military Assistance Program and the International Military Education and Training Program in that the Recipient provides reimbursement for defense

articles and services transferred (JCS Pub 1). Includes cash sales from stocks (inventories, services, training) by the DOD; DOD guarantees covering financing by private or Federal Financing Bank sources of credit sales of defense articles and defense services (Secs 21, 22, 23 and 24 AECA).

Foreign Military Sales Order No. I (FMSO No.I). Provides for pipeline capitalization of a cooperative logistics support arrangement, which consists of stocks "on hand" and replenishment of stocks "on order" in which the participating country buys equity in U.S. supply system for support of a specific weapons system. Even though stocks are not moved to a foreign country, delivery (equity) does in effect take place when the country pays for the case.

Foreign Military Sales Order No. II (FMSO No. II). Provides for replenishment of withdrawals of consumption-type items (repair parts, primarily) from the DOD Supply System to include charges for accesorial costs and a systems service charge.

Foreign Military Sales Trainees. Foreign nationals receiving training conducted by the Department of Defense on reimbursable basis, at the country's request (JCS Pub 1).

Government Furnished Equipment (GFE). Items in the possession of, or acquired by, the government and delivered to or otherwise made available to the contractor.

Harmonization. The process and/or results of adjusting differences or inconsistencies to bring significant features into agreement.

Host Nation Support. Civil and military assistance provided by host nations to allied forces and organizations in peace, transition to war, and wartime.

Independent European Programme Group (IEPG). The IEPG was created in November 1975 as an independent forum to promote closer inter-European cooperation in the development, production, and procurement of defense equipment. Its members are Belgium, Denmark, France, Germany, Greece, Italy, Luxembourg, The Netherlands, Norway, Turkey, and The United Kingdom.

Interchangeability. A condition which exists when two or more items possess such functional and physical characteristics as to be equivalent in performance, fit and durability, and are capable of being exchanged one for the other without alteration of the items themselves or of adjoining items, except for adjustment.

Interoperability. The ability of systems, units, or forces to provide services to and accept services from other systems, units, or forces and to use the services so exchanged to enable them to operate effectively together. See also logistic interoperability.

Leader-Follower Concept. A government contractual relationship for the delivery of an end item through a prime/sub relationship or to provide assistance to another company. (Ref: DAR 4-703). (1) Prime contract awarded to established source (leader) who is obligated to subcontract to and assist another source (follower). (2) A contract is awarded to a leader requiring

him to assist the follower who has prime contract for production. (3) Prime contract awarded to the follower for production and follower is obligated to subcontract with a designated leader for assistance. (The leader can or cannot be producing under another contract).

Licensed Production. Licensed Production involves agreements made by U.S. commercial firms with international organizations, foreign governments, or foreign commercial firms. USG involvement is limited to the case license process. (International Relations Dictionary, Department of State Library, 1978).

Logistic Interoperability. A form of interoperability whereby the service to be exchanged is assemblies, components, spares, or repair parts. Logistic interoperabliity will often be achieved by making such assemblies components, spares, or repair parts interchangeable, but can sometimes be a capability less than interchangeability when a degradation of performance or some limitations are operationally acceptable. See also interoperability.

Logistics (NATO Definition). The science of planning and carrying out the movement and maintenance of forces. In its most comprehensive sense, those aspects of military operations which deal with: (a) design and development, acquisition, storage, movement, distribution, maintenance, evacuation, and disposition of material: (b) movement, evacuation, and hospitalization of personnel; (c) acquisition or construction, maintenance operation, and disposition of facilities; and (d) acquisitioning or furnishing of services.

MAAG (Military Assistance Advisory Group). A joint service group normally under the military command of a commander of a unified command and representing the Secretary of Defense which primarily administers the United States military assistance planning and programming in the host country (JCS Pub 1). As used herein, the term MAAG encompasses Joint U.S. Military Advisory Groups, Military Missions, Military Assistance Groups, U.S. Military Groups, and U.S. Military Representatives exercising responsibility within a U.S. Diplomatic Mission for security assistance and other related DoD matters. Defense Attaches are included only when specifically designated as having security assistance functions.

Memorandum of Understanding A written arrangement or understanding between governments and/or international agencies, setting forth the terms under which they will cooperate in the performance of certain work such as research, development, production or utilization. The MOU usually sets down, in broad terms, the objectives of the programme, the work to be performed by each participant and its financing, the rights to technical data and patents to be acquired and other necessary elements concerned with the administration and performance of the programme. (NATO)

Mission Analysis. A process to determine the operational capabilities of military forces that are required to carry out assigned missions, roles and tasks in the face of the existing and/or postulated threat with an acceptable degree of risk. Having ascertained the quality and quantity of the military forces required, a comparative assessment is made between those available and those required in order to identify the qualitative and quantitative deficiencies which may be related to the element of risk involved. (NATO)

Mission Area. A mission area is a grouping of military activities by mission-related functions. (NATO)

Mission Need. A statement based on a mission analysis identifying in broad outline a quantitative or qualitative operational deficiency that cannot be solved satisfactorily with existing or planned forces and/or equipment. (NATO)

Military Assistance Program (MAP). That portion of the United States security assistance authorized by the Foreign Assistance Act of 1961, as amended, which provides defense articles and services to recipients on a not-reimbursable (grant) basis. (JCS Pub 1).

Military Assistance and Sales Manual (MASM). A manual published by the Defense Security Assistance Agency under authority of DOD Directive 5105.38. It sets forth the responsibilities, policies, and procedures governing the administration of Security Assistance within the DOD.

Mission Element Need Statement (MENS). A statement prepared by a DOD Component to identify and support the need for a new or improved mission capability. The mission need may be the result of a projected deficiency or obsolesence in existing systems, a technological opportunity, or an opportunity to reduce operating costs. The MENS is submitted to the Secretary of Defense for a Milestone 0 decision. (Reference DOD Instruction 5000.2).

National Policy and Procedures for the Disclosure of Classified Military Information to Foreign Governments and International Organizations (U) (Short Title: National Disclosure Policy) (NDP-1). Promulgates national policy and procedures in the form of specific disclosure criteria and limitations, definitions of terms, release arrangements, and other guidance required by U.S. departments and agencies having occasion to release classified U.S. military information to foreign governments and international organizations. In addition, it establishes and provides for the management of an interagency mechanism and procedures which are required for the effective implementation of the policy.

NATO Armaments Planning Review (NAPR). The NAPR is a process which includes annual national submissions to NATO on equipment replacement schedules for major systems thus providing a means to review national armaments plans and identify opportunities for armaments cooperation.

NATO Staff Requirement. A detailed statement of the required design parameters and operational performance of the equipment or weapon system(s). This document represents the specification of the system upon which project definition is based. (NATO)

NATO Staff Target. A broad outline of the function and desired performance of new equipment or weapons system(s), before the feasibility or method of meeting the requirement, or other implications have been fully assessed. Based upon the findings of any prefeasibility study(ies), the NATO staff target lists, in greater detail, operational characteristics and certain technical specifications which are desired and which have been shown to be broadly feasible. It may also contain broad cost parameters when required. (NATO)

Offset Agreements. Offset agreements include any agreement by DoD to purchase items from a foreign country in order to offset some specific amount or percentage of the foreign country's expenditures in the United States for U.S. defense items. This includes any arrangement whereby the U.S. Government, to include the Department of Defense, agrees to assist a U.S. defense contractor in some offset associated with a direct commercial sale. Such offset agreements are entered into only after approval by the Secretary or Deputy Secretary of Defense and after approval of the Department of State in accordance with its defined procedures. Private offset agreements may be between U.S. companies and foreign companies, entities or governments. They have the effect of obligating the U.S. company to place orders or subcontracts in foreign countries as a condition for the sale of U.S. defense articles to those countries.

Operation & Maintenance Costs (O&M Costs). Costs associated with equipment, supplies, and services required to train, operate, and maintain forces in a recipient country, including cost of spare parts other than concurrent spares and initial stockages, ammunition and missiles used in training or replacements for such items expended in training or operations, rebuild and overhaul costs (excluding modernization) of equipment subsequent to initial issue, training and other services that do not constitute investment costs, and administrative costs associated with overall program management and administration.

Operational Test and Evaluation. That test and evaluation conducted to estimate a system's operational effectiveness and operational suitability, as well as the need for any modifications. It is accomplished by operational and support personnel of the types and qualifications expected to use and maintain the system when deployed and is conducted in as realistic an operational environment as possible.

Outline NATO Staff Target. A very broad outline of the function and desired performances of a new weapon or equipment to satisfy a mission need, before the possibilities of achievement and the financial aspects have been examined. This approved document contains operational characteristics, details of the threat, desired capability and a general indication of size in particular and broad cost parameters whenever possible. Sufficient detail is given to enable prefeasibility study(ies) to be carried out. (NATO)

Periodic Armaments Planning System (PAPS). PAPS is a systematic procedure that the Conference of National Armament Directors (CNAD) would use to identify Alliance missions needs, and to seek cooperatively developed equipment.

Planning, Programming, Budget System (PPBS). An integrated system for the establishment, maintenance, and revision of the Five Year Defense Plan (FYDP) and the DoD budget.

Prefeasibility Study. A prefeasibility study indicates whether or not the outline NATO staff target merits a deeper feasibility study. It is conducted either by industry and/or government agencies or by NATO Industrial Advisory Group (NIAG). Its aim is to examine the proposal, assess the trade-off points and make a broad assessment of the practicable alternatives and also the penalties involved in adopting certain courses of action.

The study should, so far as possible, establish the feasibility of suitable solutions consistent with the calendar of needs. The prefeasibility study will result in the establishment of a NATO staff target.

This document is used as a basis for the request for proposals from industry for a solution or for a feasibility study of the system. (NATO)

Project Definition. The process of exploring more thoroughly all aspects of the proposed project and to examine specially the relations between required performances, development time and cost. The areas of technical uncertainty are examined and possible trade-offs are evolved in order to achieve a satisfactory balance between performance, development time and cost. These trade-offs may lead to amending the operational requirement. From then on, performance requirements and detailed requirements regarding the technical characteristics are established so as to meet the operational requirement under the best conditions.

These requirements will form the basis of the establishment of a development programme and of more detailed and realistic estimates of development time and cost.

The overall results of the studies carried out during project definition will be used for the discussion on whether to proceed with the development or not. (NATO)

Program Decision Memorandum (PDM). A document which provides Secretary of Defense decisions on the Program Objectives Memorandum (POM) and the Joint Program Assessment Memorandum (JPAM).

Rationalization. Any action that increases the effectiveness of allied forces through more efficient or effective use of defense resources committed to the Alliance. Rationalization includes consolidation, reassignment of national priorities to higher alliance needs, standardization, specialization, mutual support, improved interoperability, or greater cooperation. Rationalization applies to both weapons/materiel resources and nonweapon military matters.

Research Objective. A result to be obtained by a research activity, stated in operational and scientific or technological terms. (NATO)

Research Requirement. A research rationale to justify the decision to start the relevent research activity. (NATO)

Security Assistance. Group of programs authorized by the Foreign Assistance Act of 1961, as amended, and the Arms Export Control Act, as amended, or other related statutes by which the United States provides defense articles, military training, and other defense related services, by grant, credit or cash sales, in furtherance of national policies and objectives. (JCS Pub 1).

STANAG. Standardization Agreement (NATO). The record of an agreement among several or all the member nations to adopt like or similar military equipment, ammunition, supplies and store; and operational, logistic and administrative procedures. National acceptance of a NATO allied publication

issued by the Military Agency for Standardization may be recorded as a Standardization Agreement (STANAG).

Standardization. The process by which member nations of NATO achieve the closet practicable cooperation among forces, the most efficient use of research, development and production resources, and agree to adopt on the broadest possible basis the use of: (a) common or compatible operational, administrative, and logistic procedures; (b) common or compatible technical procedures and criteria; (c) common, compatible, or interchangeable supplies, components, weapons, or equipment; and (d) common or compatible tactical doctrine with corresponding organizational compatibility.

Supply Support Arrangement Sales Case. Peacetime military logistics support systems designed to provide responsive and continuous support for U.S. - made military material possessed by foreign countries.

Systems Acquisition Process. The sequence of acquisition activities starting from the agency's reconciliation of its mission needs, with its capabilities, priorities and resources and extending through the introduction of a system into operational use or the otherwise successful achievement of program objectives.

Teaming Arrangements. An agreement of two or more firms to form a partnership or joint venture to act as a potential prime contractor; or an agreement by a potential prime contractor to act as a subcontractor under a specified acquisition program; or an agreement for a joint proposal resulting from a normal prime contractor-subcontractor, licensee-licensor, or leader company relationship.

Weapon System Life Cycle. The period divided into phases, ranging from the first considerations on the need for a weapon system through the development and in-service stages down to phasing-out and disposal. (NATO)

Work Breakdown Structure. A product-oriented family tree division of hardware, software, services, and other work tasks which organizes, defines, and graphically displays the product to be produced, as well as the work to be accomplished to achieve the specified product.

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DODD 2010.6
STANDARDIZATION AND INTEROPERABILITY
AND
DODD 5000.1
MAJOR SYSTEM ACQUISITION
WITHIN NATO

THE SYSTEM ACQUISITION PROCESS IS A PHASED PROGRAM OF ACTIVITIES AND DECISION EVENTS FOR THE PURPOSE OF PROVIDING AN AUDIT TRAIL FOR ESTABLISHING PROGRAM OBJECTIVES IN THE ACQUISITION OF DEFENSE SYSTEMS. THE PROCESS IS INITIATED WITH THE APPROVAL OF A MISSION NEED. A CONTINUOUS ANALYSIS OF MISSION AREAS IS CONDUCTED BY THE DoD COMPONENTS BASED UPON A RECONCILING OF OVERALL CAPABILITIES, PRIORITIES AND RESOURCES. THE MISSION NEED SO DOCUMENTED SHALL BE STATED IN TERMS OF MISSION, PURPOSE, CAPABILITY, SCHEDULE AND COST OBJECTIVES, AND OPERATING CONSTRAINTS. THE MISSION NEED SHOULD BE INDEPENDENT OF PERFORMANCE OR CHARACTERISTICS OF EXISTING SYSTEMS.

THE SECDEF IS RESPONSIBLE FOR DECISIONS TO INITIATE, REDIRECT OR TERMINATE PROGRAMS, NORMALLY MADE AT THE FOUR DECISION POINTS. THESE DECISIONS ARE BINDING ON THE DoD COMPONENTS. PROGRAM EXCEPTIONS AND VARIANCES BREACHING THE SECDEF DECISIONS SHALL BE RESOLVED WITH THE OSD STAFF HAVING PRIMARY FUNCTIONAL RESPONSIBILITY. THE USD(R&E) IS THE DAE.

THE RESPONSIBILITY OF THE PROJECT MANAGER BEGINS AT THE APPOINTMENT FOLLOWING MILESTONE I APPROVAL OF THE MENS WITH THE DEVELOPMENT AND TAILORING OF AN ACQUISITION STRATEGY. THIS STRATEGY IS TO BE EXPANDED AND REFINED AS THE PROGRAM MATURES. THE PROGRAM MANAGER IS DIRECTLY RESPONSIBLE FOR DIRECTING THE PROGRAM TO INCLUDE MAXIMUM USE OF EFFECTIVE COMPETITION, LIFE CYCLE COST, COSTS AND SCHEDULES FOR SYSTEM DEVELOPMENT, PERFORMANCE, TRADE-OFFS, LOGISTICS SUPPORT, ETC. THE PROJECT MANAGER IS RESPONSIBLE FOR CONTRACT ACTIONS.

THE RECOMMENDATIONS OF MILESTONES I, II AND III ARE DOCUMENTED BY THE DCP AND REVIEWED BY THE DSARC PRIOR TO THE SECDEF DECISION. THE SECDEF REAFFIRMS THE MISSION NEED AND APPROVAL OF A STATED COURSE OF ACTION. PROGRAM MANAGEMENT CONSTRAINTS ARE ESTABLISHED AT MILESTONE I. PERFORMANCE AND COST AND SCHEDULE ESTIMATES ARE NOT FORMALIZED PRIOR TO THE MILESTONE II DECISION. MANAGEMENT THRESHOLDS ARE ESTABLISHED AT MILESTONE II. APPROVAL OF THE SYSTEM FOR PRODUCTION IS ACCOMPLISHED AT MILESTONE III. RECENT DECISIONS AT THE OFFICE OF THE SECRETARY OF DEFENSE WILL REALIGN THE USARC MILESTONES WHICH WILL BE REFLECTED IN REVISED DoD DIRECTIVES 5000.1 AND 5000.2.

TEST AND EVALUATION ESTIMATING MILITARY UTILITY, OPERATIONAL EFFECTIVENESS, AND OPERATIONAL SUITABILITY INCLUDING LOGISTICS SUPPORT REQUIREMENTS ARE TO BE ACCOMPLISHED PRIOR TO MILESTONE III. THE NUMBER AND SKILL LEVELS OF PERSONNEL REQUIRED TO OPERATE AND MAINTAIN THE SYSTEM, INTEGRATION OF HUMAN FACTORS AND ENGINEERING, SELECTION OF PERSONNEL AND TRAINING INCLUDING TRAINING DEVICES AND SIMULATORS, LOGISTICS SUPPORT PLANNING INCLUDING RELIABILITY, MAINTAINABILITY, AND MAINTENANCE CONCEPTS SHALL ALSO BE PART OF MILESTONE III REVIEWS.

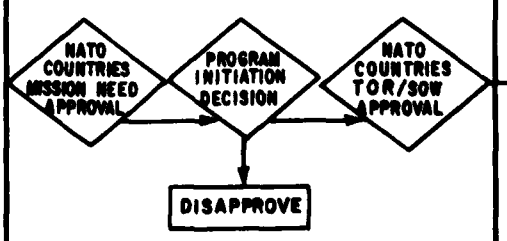
REPORTS TO THE SECDEF DEALING WITH THE QUARTERLY, POST MILESTONE III STATUS AND THRESHOLD BREACHES SHALL BE REPORTED IN THE SELECTED ACQUISITION REPORT (SAR).

THE DoD ACTIVELY SEEKS STANDARDIZATION AND INTEROPERABILITY OF WEAPONS SYSTEMS AND EQUIPMENT WITHIN NATO IN ORDER TO CONSERVE RESOURCES AND INCREASE THEIR COMBINED CAPABILITY. ONE FUNCTION OF THE DSARC, SISAR'S AND PPBS IS TO REVIEW ANY DIFFERENCES AND DETERMINE IF THEY ARE JUSTIFIED. IT IS THE RESPONSIBILITY OF THE DoD COMPONENTS TO INCLUDE NATO STANDARDIZATION AND INTEROPERABILITY GOALS AS FUNDAMENTAL CONSIDERATIONS IN ALL PHASES OF THE ACQUISITION PROCESS. THEY SHOULD A) CONSIDER NATO ALLIES' SYSTEMS, SYSTEMS DERIVATIVES, SUBSYSTEMS AND COMPONENTS EARLY IN THE DEVELOPMENT CYCLE, B) SEEK AGREEMENT WITHIN NATO ON MILITARY OPERATIONAL NEEDS, SYSTEM REQUIREMENTS AND SCHEDULES FOR DEVELOPMENT AND PRODUCTION BASED UPON AGREED NATO DOCTRINE AND OPERATIONAL CONCEPTS, C) EMPLOY LICENSING AGREEMENTS WITH NATO ALLIES, D) ESTABLISH NATO CONFIGURATION CONTROL GROUPS FOR NEW WEAPON SYSTEMS, E) SUPPORT PROCUREMENT AGREEMENTS WITH NATO COUNTRIES FOR EQUITABLE AND COMPETITIVELY DETERMINED FLOW OF DEFENSE TRADE WITHIN NATO. EARLY MUTUAL EXCHANGE OF TECHNOLOGICAL INFORMATION LEADING TO DEVELOPMENT AND ADOPTION OF STANDARDIZED OR INTEROPERABLE WEAPON SYSTEMS BY NATO COUNTRIES IS ENCOURAGED.

A LONG RANGE FORECASTING PHASE EQUIVALENT TO THE U.S. MISSION AREA ANALYSIS, IS CONDUCTED CONTINUOUSLY AND IS A BROAD ASSESSMENT OF TRENDS IN TECHNOLOGY, THE THREAT AND OTHER SUCH AREAS AS POLITICAL, ECONOMIC AND SOCIAL FACTORS. THE POSSIBLE IMPLICATIONS MUST BE STUDIED CONTINUOUSLY IN ORDER TO ENSURE THAT ALL MILITARY ELEMENTS OF NATO MAINTAIN THE ABILITY TO DETER OR COUNTER THE THREAT INCLUDING DOCTRINE, TACTICS, FORCE LEVELS, LOGISTICS, WEAPONS ACQUISITION, ETC.... DURING THE CONTINUOUS PROCESS OF MISSION ANALYSIS, SPECIFIC OPERATIONAL DEFICIENCIES IN CAPABILITIES WOULD BE IDENTIFIED. THESE DEFICIENCIES WILL USUALLY BE RELATED TO ONE OR MORE TACTICAL SUBCONCEPTS. THESE DEFICIENCIES, WHEN DOCUMENTED, BECOME "MISSION NEEDS," PREPARED BY EITHER THE NATIONAL MILITARY STAFFS OR AGENCIES. THESE MISSION NEEDS ARE DOCUMENTED AS

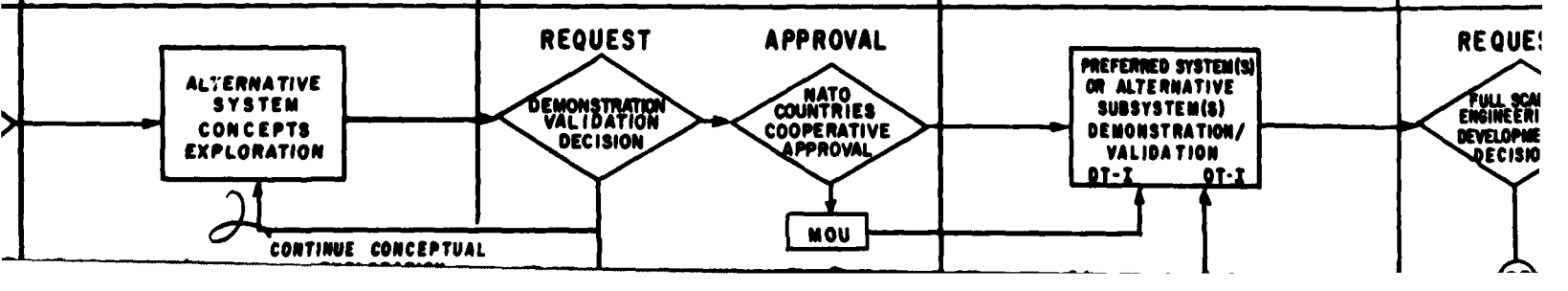
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PERIODIC ARMAMENTS PLANNING SYSTEM MILESTONES AND PHASES	MILESTONE I / MND	PHASE I / NEED EVALUATION	MILESTONE-2 / ONST
RESPONSIBILITIES	- OFFICE OF NATO IS FOCAL POINT FOR NATIONAL ARMAMENTS DIRECTORS, NMAs, AND OTHER NATO STAFFS AND AGENCIES FOR REVIEW OF MISSION NEED - MISSION NEED TO BE REFINED INTO A SET OF HARMONIZED NATIONAL SYSTEM REQUIREMENTS BY NATO SUB GROUP PANEL		
ACTIONS	- MISSION NEEDS PREPARED BY NATIONAL MILITARY STAFFS OR NMAs INITIATE PHASE I - MISSION NEEDS EVALUATION - OUTLINE NATO STAFF TARGET DEVELOPED BY A NATO SUB GROUP PANEL - NATO SUB GROUP PANEL DRAFTS APPROPRIATE FOLLOW-ON DOCUMENTATION		
DOCUMENTS	- MISSION NEED - OUTLINE NATO STAFF TARGET - APPROPRIATE FOLLOW-ON DOCUMENTATION (TOR/MOU AND SOW)		
DECISION CRITERIA	- NATO NAG SUB GROUP/PANEL PROVIDES FORUM FOR DISCUSSIONS ON NATO COUNTRIES RESPONSE - A CONSENSUS OF PARTICIPATING NATIONS IS REQUIRED AT EACH STEP - BASED ON OUTLINE STAFF TARGET, PARTICIPATING NATIONS AGREE TO FORM A NAG PROJECT GROUP AND CONDUCT PREFEASIBILITY STUDIES		

ACQUISITION PHASES / MAJOR DECISIONS / ELEMENTS ORGANIZATION AND FUNCTIONS	MILESTONE 0 PROGRAM INITIATION DECISION
DESCRIPTION	- TO APPROVE [illegible] IDENTIFICATION OF ALTERNATIVE CONCEPTS - TO DETERMINE THAT A VALID MISSION ELEMENT NEED EXISTS, AND A MAJOR SYSTEM ACQUISITION PROGRAM, OR MODIFICATION TO AN EXISTING CAPABILITY IS REQUIRED - TO DIRECT ONE OR MORE OF THE DoD COMPONENTS TO IDENTIFY, EXPLORE, AND DEVELOP ALTERNATIVE SOLUTIONS TO SATISFY THE APPROVED NEEDS
PRIMARY OBJECTIVES	- TO DETERMINE THAT A VALID MISSION ELEMENT NEED EXISTS, AND REQUEST SECDEF APPROVAL TO PROCEED TO IDENTIFY AND EXPLORE ALTERNATIVE SOLUTIONS TO THE MISSION NEED
ACQUISITION CYCLE	

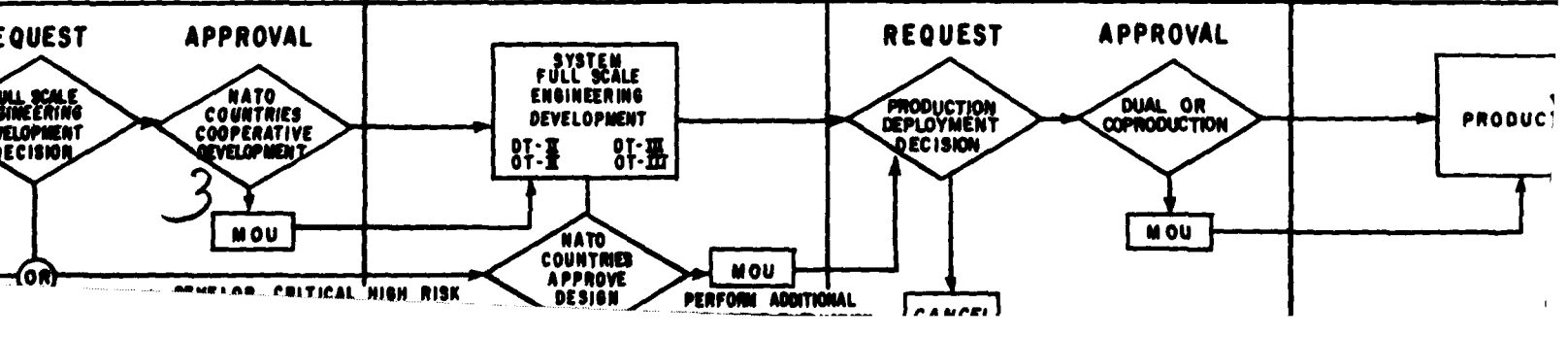
LIFE CYCLE OF MAJOR SYSTEM ACQUISITIONS

PHASE 2 PREFEASIBILITY	MILESTONE 3 NATO STAFF TARGET	PHASE 3 FEASIBILITY	MI NATO STA
POSSIBLE SOLUTIONS DEVELOPED BY USING NATIONAL, JOINT OR NMS STUDIES IF NEEDED		PROJECT GROUP PROVIDES CLEARING TO PARTICIPATING COUNTRIES PROJECT GROUP MAY DIRECT AND EVALUATE FEASIBILITY STUDIES NATO INTERNATIONAL STAFF MONITORS THE PROJECT AND COORDINATES WITH NATIONS SEPARATE MILITARY AUTHORITIES PLAN FOR TRAINING AND OPERATION	
- DO PREFEASIBILITY STUDY	- NATO STAFF TARGET DEVELOPED BY A NAG SUB GROUP/PANEL. - NATO SUB GROUP/PANEL DRAFTS APPROPRIATE FOLLOW-ON DOCUMENTATION.	- DO FEASIBILITY STUDY. - NATIONS PROVIDE CENTRALIZED MANAGEMENT - PROJECT GROUP DEVELOPS SYSTEM SPECIFICATIONS AND EVALUATES CANDIDATE CONCEPTS. - DEVELOPMENT AND PRODUCTION SCHEDULE PREPARED - DEVELOP LOGISTICS PLAN AND MANPOWER AND TRAINING REQUIREMENTS - ESTIMATE UNIT PRODUCTION, FLYAWAY AND LIFE CYCLE COSTS	- APPROVE NATO STAFF RE - DEVELOPMENT APPROC
- PREFEASIBILITY STUDY REPORTS.	- NATO STAFF TARGET. - APPROPRIATE FOLLOW-ON DOCUMENTATION (TOR/MOU, SOW, AND INITIAL PROJECT PLAN).	- FEASIBILITY STUDY REPORTS AND PROTOTYPE DEMONSTRATIONS - PROGRESS REPORTS BY NATO INTERNATIONAL STAFF	- NATIONAL STAFF
	- INITIATE COOPERATIVE DEVELOPMENT PROGRAM, BASED ON NATO STAFF TARGET, BY APPROVAL OF MOU BY PARTICIPATING COUNTRIES		- NATIONAL APPROVAL F MOU/TOR AND APPROVAL PLAN - INITIATE MORE OPTIONS
PHASE 0 **CONCEPT EXPLORATION**	**MILESTONE I** **DEMONSTRATION / VALIDATION DECISION**	**PHASE I** **DEMONSTRATION/ VALIDATION**	**MI** **FULL SC**
- CONCEPTS, OR MODIFICATIONS TO AN EXISTING CAPABILITY - DEVELOP ACQUISITION STRATEGY - ESTABLISH TECHNICAL, ECONOMIC AND MILITARY BASES FOR THE PROGRAM - TRANSLATE OPERATIONAL/MISSION ELEMENT NEEDS INTO SYSTEM TECHNICAL PERFORMANCE REQUIREMENTS - DEVELOP LOGISTIC AND MAINTENANCE CONCEPTS FOR ALTERNATIVE SYSTEMS - COMPETENT INDUSTRY AND/OR EDUCATIONAL INSTITUTIONS SHALL BE PRIMARY SOURCES FOR THE EXPLORATION OF COMPETITIVE SYSTEM DESIGN CONCEPTS	- REVIEW/CRITIQUE THE ACQUISITION STRATEGY, PROCUREMENT STRATEGY AND MANAGEMENT APPROACH - SELECT/CRITIQUE THE SYSTEM ALTERNATIVE(S) TO BE DEVELOPED - REVIEW/CRITIQUE THE ACQUISITION STRATEGY - REVIEW/CRITIQUE THE PROCUREMENT STRATEGY - REVIEW/CRITIQUE THE SHORT AND LONG-TERM BUSINESS PLANNING - REVIEW/CRITIQUE THE TEST AND EVALUATION PLANNING AND ESTABLISHED PROGRAM CONSTRAINTS	- CONDUCT ALTERNATIVE SYSTEM(S) ANALYSES, ESTABLISH RELATIONSHIPS BETWEEN NEED, URGENCY, RISK AND WORTH TO MAKE PRACTICAL TRADE-OFF OF SYSTEM CAPABILITY, COST AND SCHEDULE - CONDUCT COMPETITIVE DEMONSTRATIONS OF FULL-SCALE PROTOTYPES OF SYSTEMS OR CRITICAL SUBSYSTEMS IN REALISTIC ENVIRONMENTS, WHEN FEASIBLE AND PRACTICAL. - EXPAND AND REFINE ACQUISITION STRATEGY	- REAFFIRM THE MISSION FOR FULL-SCALE ENGINEE LONG-LEAD PRODUCTION TEST AND EVALUATION - SYSTEM DEMONSTRATION - REVIEW/CRITIQUE ACQUIS - REVIEW/CRITIQUE STA INCONSISTENT WITH RISKS - REVIEW/CRITIQUE PROGR CONSTRAINTS AND REQUISITES FOR PLANNING AND CONSISTEN
- PROVIDE THE BASES FOR SELECTION OF ONE OR MORE SYSTEMS WHICH WARRANT FURTHER DEVELOPMENT TO SATISFY A VALID MISSION ELEMENT NEED - BRASSBOARD AND BREADBOARD ENGINEERING PROTOTYPES	TO REAFFIRM THAT THE MISSION ELEMENT TASK TO BE ACCOMPLISHED IS ESSENTIAL, AND TO APPROVE THE ALTERNATIVE SYSTEM DESIGN CONCEPTS FOR DEVELOPMENT	TO CONDUCT DEMONSTRATIONS OF VIABLE ALTERNATIVE SYSTEMS OR CRITICAL SUBSYSTEMS, TO PROVIDE A BASIS FOR SELECTION OF A SYSTEM FOR FULL-SCALE ENGINEERING DEVELOPMENT MOCKUPS AND ADVANCED ENGINEERING PROTOTYPES	- APPROVAL TO PROCEED FULL-SCALE ENGINEERING LONG-LEAD PRODUCTION TEST AND EVALUATION



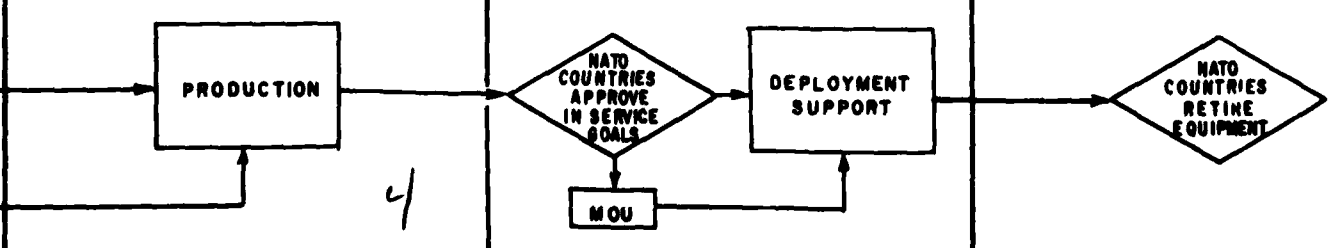
IS INCLUDING NATO CONSIDERATIONS

MILESTONE 4 STAFF REQUIREMENT	PHASE 4 PROJECT DEFINITION	MILESTONE 5 NADDO	PHASE 5 DESIGN AND DEVELOPMENT	MILESTONE 6 NATO PRODUCTION OBJECTIVE	PHASE 6 PRODUCTIO
NATO NEEDS AND ESPECIALLY ORD	SEPARATE MILITARY AUTHORITIES DEVELOP PLANS FOR MAINTENANCE, SUPPLY AND TRAINING REQUIREMENTS AND EQUIPMENT				- SEPARATE MILITARY AUTHORITIES INITIATE - ACQUISITION OF SPARE PARTS AND MAINTEN. PROVISIONING.
STAFF REQUIREMENT COPRODUCTION AND LICENSING AGREEMENTS DEVELOPED	- DO PROJECT DEFINITION - JOINT CONFIGURATION MANAGEMENT SYSTEM ESTABLISHED	- DO DESIGN DEVELOPMENT UNDER THE TECHNICAL AUTHORITY - ESTABLISH PERMANENT MANAGEMENT OFFICE - PREPARE NADDO. - APPROVE NADDO AND APPROPRIATE FOLLOW-ON DOCUMENTATION (MOU FOR COOPERATIVE DESIGN AND DEVELOPMENT)	- EVALUATE SYSTEM PROTOTYPES. - DO DESIGN AND PRODUCTION ENGINEERING - UPDATE PRODUCTION SCHEDULE. - UPDATE LOGISTICS MANPOWER, AND TRAINING PLAN. - UPDATE UNIT PRODUCTION, FLYAWAY AND LIFE CYCLE COSTS.	- MANAGEMENT OFFICE PREPARES NATO PRODUCTION OBJECTIVE AND MOU FOR COOPERATIVE PRODUCTION.	- PLAN PREPRODUCTION AND PRODUCTION - JOINT CONFIGURATION MANAGEMENT SYSTEM LOGISTICS AND MANAGEMENT TEAM
STAFF REQUIREMENT	- DESIGN DETAILS AND SUBSYSTEM SPECIFICATIONS. - PERIODIC REPORTS TO CNAD.	- ANNUAL REPORT; MILESTONE REPORT STATUS REVIEW	- ANNUAL REPORTS. - DRAFT MOU FOR PRODUCTION PHASE.	- NATO PRODUCTION OBJECTIVE AND APPROPRIATE FOLLOW-ON DOCUMENTATION (TOR/MOU AND SOW). - ANNUAL REPORT MILESTONE REPORT/STATUS REVIEW.	- ANNUAL REPORT MILESTONE REPORT - DATA COLLECTION.
APPROVAL OF NATO STAFF REQUIREMENTS AND SIGNING OF AND APPROVAL OF OTHER APPROPRIATE FOLLOW-ON DOCUMENTA- NATIONS DESIRE TO PURSUE JOINT DEVELOPMENT PROGRAM		- CNAD PROVIDES FORUM FOR DISCUSSION OF ISSUES. - COMMITTEE APPROVES NATO DESIGN AND DEVELOPMENT OBJECTIVE.		- CNAD PROVIDES FORUM FOR DISCUSSION OF ISSUES. - COMMITTEE APPROVES NATO PRODUCTION OBJECTIVE.	
MILESTONE II **L SCALE DEVELOPMENT DECISION**	**PHASE 2** **FULL SCALE DEVELOPMENT**			**MILESTONE III** **PRODUCTION - DEPLOYMENT DECISION**	**PRODUCTI PHASE**
NEED, AND APPROVE THE SELECTION OF A SYSTEM ENGINEERING DEVELOPMENT, INCLUDING (1) PROCUREMENT OF CTION ITEMS, AND (2) LIMITED PRODUCTION OF OPERATIONAL UATION STRATION AND VALIDATION RESULTS QUE ACQUISITION STRATEGY QUE OTC AND LCC REQUIREMENTS, DETERMINE THRESHOLDS ARE ITH RISKS QUE PRODUCIBILITY, TEST AND EVALUATION MASTER PLAN UISITES FOR MILESTONE III DECISION, INCLUDING OPERA- OGISTIC SUPPORT	THE TOTAL SYSTEM, AND ALL ITEMS NECESSARY FOR SUPPORT, INCLUDING TRAINING(S), IS SPECIFIED IN DETAIL, DESIGNED AND FABRICATED IN LIMITED QUANTITIES, TESTED AND EVALUATED			REAFFIRM MISSION ELEMENT TASK TO BE ACCOMPLISHED (WITH UPDATED THREAT) CONFIRM THAT A PRACTICAL ENGINEERING DESIGN IS COMPLETE, OTC AND LCC ARE REALISTIC; SYSTEM IS COST-EFFECTIVE AND AFFORDABLE, AND INITIAL OPERATIONAL TEST AND EVALUATION RESULTS SUPPORT A DECISION TO PROCEED CONFIRM THAT ISSUES CONCERNING PRODUCTION, PRODUCIBILITY, QUALITY ASSURANCE, FACILITIES AND LOGISTICAL SUPPORT ARE IDENTIFIED, AND THAT PROGRAM MANAGEMENT STRUCTURE AND PLAN ARE SATISFACTORY CONFIRM THAT PLANNING FOR DEPLOYMENT, INCLUDING MANPOWER AND TRAINING LOGISTICS, IS ADEQUATE. CONFIRM THAT THE ACQUISITION STRATEGY HAS BEEN UPDATED, AND IS SUPPORTED BY THE BUSINESS PLANNING.	- (WEAPON SYSTEM PRODUCTION AND DEPLOYMENT) - TRAINING EQUIPMENT, SPARES, SUPPORT EQUIPMENT AS PART OF A SUPPORTABLE WEAPONS SYSTEM
APPROVAL OF A RECOMMENDED ALTERNATIVE SYSTEM FOR ENGINEERING DEVELOPMENT, SUBSEQUENT PRODUCTION ITEMS AND ATION	TO COMPLETE, PRIOR TO COMMITMENT TO FULL-SCALE PRODUCTION, ENGINEERING AND PRODUCTION DESIGN; TEST AND EVALUATION REQUIRED TRAINING AND SUPPORT PLANNING. SYSTEM DEVELOPMENT PROTOTYPE AND PREPRODUCTION MODEL.			TO REAFFIRM THE MISSION ELEMENT TASK, DETERMINE THAT THE ENGINEERING IS COMPLETE, AND COMMIT RESOURCES TO PRODUCE AND DEPLOY THE SYSTEM TO OPERATIONAL FORCES.	- TO PRODUCE AND DELIVER OPERATIONAL SYSTEMS (ITEMS OF LOGISTIC SUPPORT) FOR DEPLOYMENT - OPERATIONAL SYSTEMS FOR DEPLOYMENT



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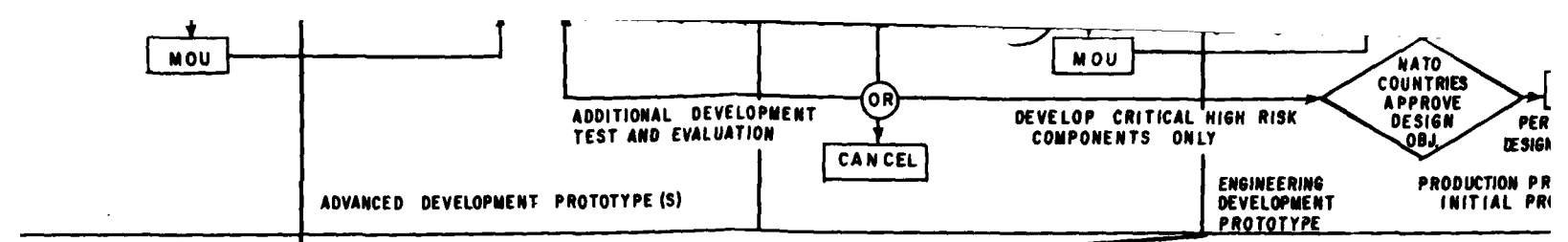
PHASE 6 PRODUCTION	MILESTONE 7 NATO IN-SERVICE GOALS	PHASE 7 IN-SERVICE	MILESTONE 8 [NATIONAL] DISENGAGEMENT INTENTIONS
- SEPARATE MILITARY AUTHORITIES INITIATE TRAINING - ACQUISITION OF SPARE PARTS AND MAINTENANCE EQUIPMENT (INITIAL PROVISIONING)	- SEPARATE MILITARY AUTHORITIES COLLECT PERTINENT DATA. - INTERNATIONAL STAFF PUBLISHES DATA. - NAPR PROVIDES ANNUAL REPORT ON CHANGES IN EQUIPMENT		
- IN PREPRODUCTION AND PRODUCTION. - JOINT CONFIGURATION MANAGEMENT SYSTEM TRANSITIONS TO JOINT LOGISTICS AND MANAGEMENT TEAM	- JOINT LOGISTICS AND TECHNICAL MANAGEMENT TEAM COORDINATES IN-SERVICE PHASE.		- NATIONS PREPARE DISENGAGEMENT INTENTIONS
- ANNUAL REPORT MILESTONE REPORT - DATA COLLECTION	- NATO IN-SERVICE GOALS AND APPROPRIATE FOLLOW-ON DOCUMENTATION (MOU)	- DATA COLLECTION.	- DISENGAGEMENT INTENTIONS
	- APPROVAL OF THE NATO IN-SERVICE GOALS AND AGREEMENT TO ENTER THE IN-SERVICE PHASE (MOU)		- NAPR COMPILES NATIONAL ARMAMENTS SCHEDULES WHICH IS ANALYZED BY INTERNATIONAL STAFF AND SHAPE ORGANIZATIONS TO IDENTIFY STANDARDIZATION/INTEROPERABILITY OPPORTUNITIES
PRODUCTION PHASE	**DEPLOYMENT PHASE**		
- WEAPON SYSTEM PRODUCED AND DEPLOYED - TRAINING EQUIPMENT, SPARES, SUPPORT EQUIPMENT PRODUCED AND DELIVERED AS PART OF A SUPPORTABLE WEAPONS SYSTEM	- OPERATING FORCES USE AND SUPPORT THE SYSTEM. - BEGINS WITH INITIAL DELIVERIES INTO THE INVENTORY AND ENDS WHEN THE SYSTEM IS PHASED FROM OPERATIONAL USE.		
- TO PRODUCE AND DELIVER OPERATIONAL SYSTEMS INCLUDING ALL NECESSARY ITEMS OF LOGISTIC SUPPORT FOR DEPLOYMENT BY THE OPERATIONAL FORCES - OPERATIONAL SYSTEMS FOR DEPLOYMENT	- TO PROVIDE SYSTEMS AND SUPPORT TO OPERATIONAL UNITS		



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OFFICE OF THE SECRETARY OF DEFENSE (1001)

	DISAPPROVE	CONTINUE CONCEPTUAL EXPLORATION BREADBOARD AND EXPERIMENTAL PROTOTYPES	CANCEL
FUNDING (PROGRAM VI)	6.1 RESEARCH TECHNOLOGY BASE IR&D	6.2 EXPLORATORY DEVELOPMENT	
RESPONSIBILITIES	- SECDEF - DETERMINES THAT A VALID MISSION ELEMENT NEED EXISTS. APPROVAL IS REQUIRED PRIOR TO COMMITMENT OF FUNDS FOR IDENTIFICATION OF ALTERNATIVE SYSTEM CONCEPTS - DEFENSE ACQUISITION EXECUTIVE (DAE) - COORDINATES PREPARED POSITION PAPER AND MISSION ELEMENT NEED STATEMENT (MENS) WITH OSD STAFF AND JCS - USD(R&E) - COORDINATE MISSION NEED WITH NATO ORGANIZATIONS AND SUBMIT DRAFT MENS TO ASD DS AS A MISSION NEED DOCUMENT	- SECDEF - MONITORS CONCEPTUAL EFFORT - USD(R&E) - IDENTIFIES MAJOR ISSUES AND REVIEWS PROGRAMS' PROGRESS AND FUNDING REQUIREMENTS, LOGISTIC CONCEPTS AND ACQUISITION STRATEGY - DAE - PRINCIPAL ADVISOR AND STAFF ASSISTANT TO SECDEF AND THE FOCAL POINT IN OSD FOR SYSTEMS ACQUISITION - ASD (COMPTROLLER) - BUDGET AND FUNDING REALISM - ASD P&E - FORCE STRUCTURE - COST ESTIMATES AND RESOURCE PROJECTION REALISM. - ASD (C³I) - COMMUNICATIONS, COMMAND, CONTROL AND INTELLIGENCE ASPECTS - ASD (M&RA) - LOGISTIC SUPPORT ISSUES AND PROCUREMENT PLANS	- SECDEF APPROVAL/DISAPPROVAL TO BE DEVELOPED - DAE - CHAIRMAN OF DSARC REVIEW - USD(R&E) - REVIEWS PROGRAM OPERATIONAL SUITABILITY ISSUES, PROCUREMENT, PRODUCT PROGRAM ACQUISITION STRATEGY - ASD (COMPT) - REVIEWS FOR BUDGET - ASD PROGRAM ANALYSIS AND EVALUATION - STRUCTURE IMPLICATIONS AND - USD (C³I) - REVIEWS FOR COMMUNICATIONS INTELLIGENCE FACTORS. - ASD (M&RA) - REVIEWS PROGRAM - JCS - REVIEWS CURRENT THREAT
ACTIONS	SECDEF - SOON INITIATES PROGRAM, STATES CONDITIONS IN PROGRAM DIRECTION DAE - PREPARES POSITION PAPER AND PROPOSED ACTION MEMORANDUM, COORDINATES POSITION PAPER AND MENS WITH OSD STAFF AND JCS DAE - COORDINATES SYSTEMS ACQUISITION PLANNING WITH THE PPBS	MONITOR CONCEPTUAL EFFORTS. MAINTAIN DIALOGUE WITH DoD COMPONENTS. PREPARE DCP OUTLINE IN JOINT OSD-DOD COMPONENT STAFF MEETING ESTABLISH DATE FOR (S)SARC AND DSARC REVIEW, OR SPECIFY THAT A DSARC REVIEW NOT BE CONDUCTED; IDENTIFY PROGRAM ALTERNATIVES TO BE CONSIDERED; SPECIFIC PROGRAM ISSUES TO BE INCLUDED; PROGRAM INFORMATION TO BE PRESENTED, AND ESTABLISH SCHEDULE OF EVENTS AND ACTIONS TO BE [illegible] PRIOR TO DSARC AND (S)SARC REVIEWS	CONDUCT DSARC REVIEW MEETING SECDEF DECISION: TO APPROVE VALIDATION PHASE, TO CONTINUE CONCEPTUAL, OR TO CANCEL THE STATES CONDITIONS AND CONSTRAINTS APPROVES PROGRAM MANAGEMENT DCP OR ACTION MEMORANDUM DAE - COORDINATE SYSTEM
DOCUMENTS	MENS - MISSION ELEMENT NEED STATEMENT (MENS). SECDEF ACTION MEMORANDUM.	MISSION AREA SUMMARY (MAS). TECHNOLOGY AREA DESCRIPTION (TAD) MISSION ELEMENT NEEDS STATEMENT (MENS) DECISION COORDINATING PAPER (DCP).	DSARC RECOMMENDATION APPROVED DCP OR ACTION MEMO DCP CONTAINS ONLY PRELIMINARY OBJECTIVES TAA - IDENTIFIES TECHNICAL
DECISION CRITERIA	MISSION NEED IS ESSENTIAL. MISSION NEED IS RECONCILED WITH OTHER DoD CAPABILITIES AND PRIORITIES MENS DOCUMENTS THE CONSIDERATIONS TO SUPPORT THE DETERMINATION OF MISSION NEED. A MAJOR SYSTEM ACQUISITION PROGRAM IS REQUIRED TO ACQUIRE A NEW SYSTEM CAPABILITY, OR A MODIFICATION TO AN EXISTING CAPABILITY. SUFFICIENT RESOURCES ARE OR CAN BE PROGRAMMED OVER THE LIFE OF THE SYSTEM		THE MISSION ELEMENT (MAS) ESSENTIAL, UPDATED THREAT ALTERNATIVE SYSTEM DESIGN TECHNOLOGY BASE AND PROVIDE FOREIGN DEVELOPMENTS (MAS) ALTERNATIVES RECOMMENDED THE MISSION ELEMENT NEED THE ESTABLISHED PROGRAM THE PROJECTED RESOURCE AND OTHER CHARACTERISTICS CONSISTENT WITH THE STATE OPERATIONAL AND LOGISTIC USE OF AVAILABLE SUBSYSTEM HARDWARE AND SOFTWARE IS THE ACQUISITION STRATEGY PROGRAM TECHNICAL, BUSINESS THE ACHIEVEMENT OF PROGRAM SHORT- AND LONG-TERM BUSINESS ACQUISITION STRATEGY PRODUCIBILITY AND RELIABILITY CONSIDERED JOINT-SERVICES, INTEROPERABILITY ARE ADEQUATELY CONSIDERED NATO STANDARDIZATION AND ADEQUATELY CONSIDERED RISK AND UNCERTAINTY (RISK IN THE PLANNING ENVIRONMENTAL CONSIDERATIONS PLANNING AND SCHEDULES - MASTER PLAN (TEMP) ARE THE PROGRAM MANAGEMENT SUPPORTED SUFFICIENT RESOURCES (M) SYSTEM AFFORDABILITY OF RESEARCH PDP



6.3 ADVANCED DEVELOPMENT

6.4 ENGINEERING DEVELOPMENT

6.5 RDT&E MANAGEMENT AND SUPPORT

...L F... ALTERNATIVE SYSTEM CONCEPTS ...ATION ...W COST, SCHEDULE, PERFORMANCE ...NG RESPONSE TO USER NEEDS, ELEMENT TEST ...ION, FACILITIES AND LOGISTICS FACTORS FOR ...EM ...BUDGET AND FUNDING REALISM ...EVALUATION PHASE ... REVIEWS FOR FORCE ...ND INITIAL OPERATIONAL CAPABILITY (IOC) ...MUNICATIONS, COMMAND ... CONTROL AND INTEL... ...RAM FOR LOGISTICS SUPPORT FACTORS ...REAT	...SECDEF ... MONITORS DEMONSTRATION AND VALIDATION PROGRAMS AND MANAGEMENT CONSTRAINTS, REVIEWS, IF EXCEEDED ...(DDR&E) ... MONITORS PROGRESS AND DCP MANAGEMENT CONSTRAINTS, COST PERFORMANCE, TECHNICAL RISKS ARE IDENTIFIED, AND RESOLUTION IS ADEQUATE, TRADE-OFFS ...TO PRODUCE MOST EFFECTIVE BALANCE, IMPLEMENTATION OF ACQUISITION STRATEGY, DEVELOPMENT OF DTC AND LCC, NATO STANDARDIZATION AND INTEROPERABILITY REQUIREMENTS ARE BEING MET ...(COMPT) ... REVIEWS BUDGET AND FUNDING REALISM ...(PA&E) ... MONITORS COST ESTIMATES REALISM AND PROGRAM TRADE-OFFS TO ...ST SCHEDULE AND CAPABILITY ... ...ST ... MONITORS COMMUNICATIONS, COMMAND, CONTROL AND INTELLIGENCE ASPECTS ... (MRA&L) ... MONITORS LOGISTICS SUPPORT ISSUES AND PROCUREMENT PLANS	...SECDEF APPROVAL/DISAPPROVAL OF ... SELECTED SYSTEM TO BEGIN FULL SCALE ENGINEERING DEVELOPMENT, LONG LEAD PROCUREMENT ITEMS, LIMITED PRODUCTION FOR OT&E ...(VCJCS) ... CHAIRMAN OF DSARC I VIEW. ...(DDR&E) ... REVIEWS, SELECTED SYSTEM CAPABILITY TO MEET REAFFIRMED MISSION ELEMENT NEEDS, FOR COST EFFECTIVENESS, TO ENSURE THAT RISKS AND UNCERTAINTIES ARE ACCEPTABLE, TO DETERMINE THAT DTC-LCC ARE REALISTIC, COST/SCHEDULE/PERFORMANCE THRESHOLDS, MAJOR SUBSYSTEM SELECTION PLANNING, PRODUCTION AND LOGISTIC CONSIDERATIONS, TEMP, ADEQUACY OF ACQUISITION STRATEGY. ...(COMPT) ... REVIEWS FOR BUDGET AND FUNDING REALISM. ...(PA&E) ... REVIEWS FOR FORCE STRUCTURE IMPLICATIONS AND IOC QUANTITY ...(C³I) ... REVIEWS FOR COMMUNICATIONS, COMMAND, CONTROL AND INTELLIGENCE FACTORS ...(MRA&L) ... REVIEWS PROGRAM FOR LOGISTICS SUPPORT FACTORS ...(DIA) ... REVIEWS CURRENT THREAT	...SECDEF ... MONITORS FULL-SCALE ENGINEERING PROGRESS AND REVIEWS PROGRAM IF THRESHOLDS EXCEEDED ...(DDR&E) ... MONITORS PROGRESS AND DCP THRESHOLDS, TECHNICAL RISKS ARE FURTHER REDUCED, TRADE-OFFS, TO EFFECT BALANCED PROGRAM, TRAINING AND ILS, DTC AND LCC REFINEMENT, PRODUCIBILITY ENGINEERING, NATO STANDARDIZATION AND INTEROPERABILITY REQUIREMENTS ...(COMPT) ... MONITORS COST AND FUNDING, PROVIDES SELECTED ACQUISITION REPORTS (SAR) ...(PA&E) ... MONITORS COST ESTIMATES REALISM, AND PROGRAM BALANCE. ...(C³I) ... MONITORS COMMUNICATIONS, COMMAND, CONTROL ASPECTS. ...(MRA&L) ... MONITORS LOGISTIC SUPPORT ISSUES AND PROCUREMENT PLANS
...TING ...ROVE PROGRAM TO PROCEED INTO DEMONSTRATION ...TENSIVE EXPLORATION OF ALTERNATIVE SYSTEM ... THE PROGRAM ...NSTRAINTS FOR ... PROGRAM ...MENT CONSTRAINTS FOR EACH ALTERNATIVE ...FORWARDED TO SERVICE FOR IMPLEMENTATION ...QUISITION PLANNING WITH THE PPBS	...REVIEWS PROGRAM EFFORTS ...REVIEWS FUNDING	...CONDUCTS DEFENSE SYSTEMS ACQUISITION REVIEW COUNCIL (DSARC) MEETING ...SECDEF APPROVAL/DISAPPROVAL OF ... PROGRAM TO PROCEED INTO FULL-SCALE ENGINEERING DEVELOPMENT PHASE, LONG LEAD PROCUREMENT ITEMS, LIMITED PRODUCTION FOR OT&E, CONDITIONS AND CONSTRAINTS FOR CONDUCT OF PROGRAM ...THRESHOLDS ESTABLISHED FOR KEY PROGRAM CHARACTERISTICS ...ACTION MEMORANDUM AND APPROVED DECISION COORDINATING PAPER (DCP) FORWARDED TO SERVICE FOR IMPLEMENTATION. ...(PA&E) ... COORDINATES SYSTEM ACQUISITION PLANNING WITH THE PPBS	...MONITORS PROGRAM THRESHOLDS ...REVIEWS FUNDING
...EMORANDUM ...ARY PROGRAM COST, SCHEDULE AND PERFORMANCE ... DCA	...NOT FOR DEMONSTRATION/VALIDATION	...RECOMMENDATIONS ...MAINTAINS FIRM PROGRAM COST, SCHEDULE AND PERFORMANCE OBJECTIVES AND THRESHOLDS ...IDENTIFIES TECHNICAL RISK. ...IS IN MEMORANDUM AND APPROVED DECISION COORDINATING PAPER (DCP)	DCP FOR FULL-SCALE ENGINEERING PHASE SELECTED ACQUISITION REPORTS (SAR)
...TO BE ACCOMPLISHED IS REAFFIRMED TO BE ...ASSESSMENT ...CONCEPTS ADEQUATELY REFLECT THE TECH... ACCEPTABLE COMPETITIVE ENVIRONMENT ...HAS BEEN CONSIDERED ...FOR DEMONSTRATION AND VALIDATION MEET ...CS ...CONSTRAINTS REMAIN VALID ...VESTMENT FOR THE SELECTED ALTERNATIVES ...RELATED TO THE ALTERNATIVES ARE ...ED CONSTRAINTS ...CAL CONSIDERATIONS ARE ADEQUATE ...STEMS AND EXISTING MILITARY AND COMMERCIAL ...S ADEQUATELY CONSIDERED ...N IS COMPLETE, EFFECTIVELY INTEGRATES THE ...NESS AND MANAGEMENT ELEMENTS AND SUPPORTS ...RAM GOALS AND OBJECTIVES ...SINESS PLANNING EFFECTIVELY SUPPORTS THE ...F PRODUCTION RISKS HAVE BEEN ADEQUATELY ...PERABILITY AND MULTI-NATIONAL CONSIDERATIONS ...RED ...ND INTEROPERABILITY REQUIREMENTS HAVE BEEN ...REAS ARE IDENTIFIED AND ADEQUATELY TREATED ...ATIONS ARE ADEQUATE ...FOR PREPARATION OF THE TEST AND EVALUATION ...ADEQUATE ...STRUCTURE AND PLAN ARE SOUND AND ADEQUATELY ...E IS OR CAN BE PROGRAMMED OVER THE LIFE OF THE ...RCH & DEVELOPMENT PROGRAM BY FULL FUNDING IN		THE MISSION ELEMENT TASK TO BE ACCOMPLISHED IS REAFFIRMED AND THE THREAT UPDATED. THE SYSTEM SELECTED MEETS THE MISSION ELEMENT NEEDS, IS COST-EFFECTIVE AND IS ACCEPTABLE WITHIN STATED CONSTRAINTS. NATO STANDARDIZATION AND INTEROPERABILITY REQUIREMENTS ARE SATISFIED PROGRAM GOALS FOR OPERATIONAL READINESS, RELIABILITY, MAINTAINABILITY, MANPOWER AND LOGISTICS PARAMETERS HAVE BEEN ESTABLISHED THE DEMONSTRATION AND VALIDATION RESULTS SUPPORT THE SYSTEM RECOMMENDED SYSTEM TRADE-OFFS HAVE PRODUCED THE MOST EFFECTIVE BALANCE IN COST, PERFORMANCE AND SCHEDULE INCLUDING OPERATIONAL AND LOGISTICAL CONSIDERATIONS. UNCERTAINTIES AND RISKS HAVE BEEN IDENTIFIED AND ARE ACCEPTABLE. PLANNING TO RESOLVE THE REMAINING UNCERTAINTIES AND RISKS IS ADEQUATE. REALISTIC FALL-BACK ACTIONS AND ALTERNATIVES HAVE BEEN ESTABLISHED. THE ACQUISITION STRATEGY HAS BEEN UPDATED, EFFECTIVELY SUPPORTS ACHIEVEMENT OF PROGRAM OBJECTIVES AND IS BEING EXECUTED IN THE CONDUCT OF PROGRAM MANAGEMENT. SHORT- AND LONG-TERM BUSINESS PLANNING SUPPORTS THE STRATEGY CONTRACT TYPES ARE CONSISTENT WITH THE PROGRAM CHARACTERISTICS, RISKS, UNCERTAINTY AND STRATEGY. DESIGN-TO-COST AND LIFE-CYCLE-COST REQUIREMENTS ARE REALISTIC AND EFFECTIVE IN ACHIEVING COST OBJECTIVES. COST, PERFORMANCE AND SCHEDULE ESTIMATES AND RELATED THRESHOLDS HAVE BEEN THOROUGHLY REVIEWED, ARE WELL DEFINED AND CONSISTENT WITH RISKS INVOLVED. ACTION TO SUBMIT THE INITIAL SELECTED ACQUISITION REPORT (SAR) IS COMPLETE. PLANNING FOR SELECTION OF MAJOR SUBSYSTEMS IS CLEARLY STATED, PROVIDES FOR SUSTAINED COMPETITION TO THE MAXIMUM EXTENT FEASIBLE AND ACCEPTS THE USE OF EXISTING MILITARY AND COMMERCIAL HARDWARE AND SOFTWARE WHERE APPROPRIATE. FOREIGN DEVELOPMENTS HAVE BEEN CONSIDERED. DEMONSTRATION AND VALIDATION TESTING AND EVALUATIONS HAVE BEEN COMPLETED AND RESULTS SUPPORT THE RECOMMENDATIONS. ELECTRONIC INFRARED/OPTICAL COUNTER-COUNTERMEASURE PERFORMANCE REQUIREMENTS HAVE BEEN IDENTIFIED. PRODUCIBILITY CONSIDERATIONS AND AREAS OF PRODUCTION RISKS HAVE BEEN REVIEWED AND THE RESULTS FOUND ACCEPTABLE REQUIREMENTS HAVE BEEN ESTABLISHED FOR LONG-LEAD PROCUREMENT ITEMS AND INITIAL LIMITED PRODUCTION TO SUPPORT OPERATIONAL TEST AND EVALUATION NEEDS FOR THE VERIFICATION OF PRODUCTION ENGINEERING AND DESIGN MATURITY AND TO ESTABLISH THE PRODUCTION BASE. THE TEST AND EVALUATION MASTER PLAN (TEMP) IDENTIFIES AND INTEGRATES THE TESTING AND EVALUATION TO BE ACCOMPLISHED PRIOR TO THE MILESTONE III PROGRAM DECISION POINTS. REQUISITES FOR THE MILESTONE III PRODUCTION AND DEPLOYMENT DECISION INCLUDING OPERATION AND LOGISTICS SUPPORT HAVE BEEN ESTABLISHED. THE PROGRAM MANAGEMENT STRUCTURE AND PLAN ARE SOUND AND ADQUATELY SUPPORTED SUFFICIENT RESOURCES ARE OR CAN BE PROGRAMMED OVER THE LIFE OF THE SYSTEM AFFORDABILITY OF R&D AND PRODUCTION PROGRAM BY FULL FUNDING IN THE FYDP	

MOU

PERFORM ADDITIONAL SIGN-TEST-EVALUATION

CANCEL

MOU

MOU

PROTOTYPE PRODUCTION MODEL

PROCUREMENT MONIES

6.6 OPERATIONAL SYSTEMS DEVELOPMENT *

* (FUNDED UNDER PROGRAMS 1 XXXX – 9 XXXX)

[OPERATIONS AND SUPPORT (O & S)]

...SK THRESHOLDS TECHNICAL RISKS ARE PROGRAM TESTING T&E PRODUCTION ENGINEER REQUIREMENTS SELECTED ACQUISITION PROGRAM TRADE-OFFS INTR & INTELLIGENCE D PROCUREMENT PLANS	SECDEF DECISION - APPROVES THE SYSTEM FOR PRODUCTION - INFORMS THE SYSTEM READY FOR PRODUCTION, REAFFIRMS MISSION NEED, AUTHORIZES THE AND COMPONENT TO DEPLOY THE SYSTEM TO THE USING ACTIVITY DAE - CHAIRMAN OF DSARC REVIEW DSARC REVIEW - ASSURES PROGRAM IS TECHNICALLY READY FOR PRODUCTION, NITIVE SUPPORTS A DECISION TO PROCEED WITH PRODUCTION AND DEPLOYMENT ALL PLANNING FOR PRODUCTION, TRAINING AND LOGISTICS ARE SATISFACTORY AND ADEQUATE, SYSTEM IS COST-EFFECTIVE AND AFFORDABLE OSD(COMPT) - REVIEWS FOR COST AND FUNDING REALISM OSD(PA&E) - REVIEWS FOR FORCE STRUCTURE AND ROE OSD(C³I) - REVIEWS FOR COMMUNICATIONS, COMMAND, CONTROL AND INTELLIGENCE FACTORS OSD(MRA&L) - REVIEWS PROGRAM FOR TRAINING, DEPLOYMENT AND ITS ADEQUACY DIA - REVIEWS CURRENT THREAT	[illegible] OPERATION REVIEW [illegible] DAE - [illegible] FOR MAJOR SYSTEM ACQUISITION MATTERS [illegible] - MONITORS PROGRAM PROGRESS, REVIEWS PROPOSED [illegible] OSD(PA&E) - MONITORS SUPPORT PLANNING AND IMPLEMENTATION OSD(C³I) - MONITORS COMMAND AND CONTROL PROCEDURES	[illegible]
	COMMITMENT TO PRODUCE AND DEPLOY SYSTEM FOR OPERATIONAL USE ACTION MEMORANDUM ON APPROVED DCP THRESHOLDS ESTABLISHED FOR PRODUCTION PHASE DAE - COORDINATES SYSTEM ACQUISITION PLANNING WITH THE FYDP	MONITORS PRODUCTION THRESHOLDS USER MODIFICATION APPROVALS RESPONDS TO SERVICE QUARTERLY REPORTS, IF REQUIRED	[illegible]
	DSARC RECOMMENDATIONS ACTION MEMORANDUM AND APPROVED DCP DCP CONTAINS TERM PROGRAM COST, SCHEDULE AND PERFORMANCE OBJECTIVES AND THRESHOLDS	SELECTED ACQUISITION REPORTS (SAR)	EXECUTIVE ACQUISITION REPORTS (SAR)
	THE MISSION ELEMENT TASK TO BE ACCOMPLISHED IS REAFFIRMED AND THE THREAT UPDATED. THE DEVELOPMENT HAS PROGRESSED SATISFACTORILY AND THE INITIAL OPERATIONAL TEST AND EVALUATION RESULTS SUPPORT A DECISION TO PROCEED WITH PRODUCTION AND DEPLOYMENT THE ACQUISITION STRATEGY HAS BEEN UPDATED AND IS BEING EXECUTED. BUSINESS PLANNING SUPPORTS THE ACQUISITION STRATEGY AND PROVIDES FLEXIBILITY FOR PRODUCTION RATES AND QUANTITIES WHEN OPTIONS ARE USED. SCHEDULE AND COST ESTIMATES ARE REALISTIC AND ACCEPTABLE INCLUDING SUPPORT AND OPERATION COSTS. DESIGN TO COST AND LIFE CYCLE COST REQUIREMENTS ARE REALISTIC AND EFFECTIVE IN ACHIEVING COST OBJECTIVES THE SYSTEM IS COST-EFFECTIVE AND AFFORDABLE AND REMAINS THE BEST ALTERNATIVE. TRADE-OFFS HAVE BEEN MADE TO BALANCE COST, SCHEDULE AND PERFORMANCE EFFECTIVELY PROGRAM AND FISCAL YEAR THRESHOLDS ARE REAFFIRMED PRODUCTION QUANTITY REQUIREMENTS ARE VALID ISSUES CONCERNING PRODUCTION, PRODUCIBILITY, QUALITY ASSURANCE AND FACILITIES ARE IDENTIFIED AND MANAGED SATISFACTORILY THE PROGRAM MANAGEMENT STRUCTURE AND PLAN ARE SOUND AND ADEQUATELY SUPPORTED NATO STANDARDIZATION AND INTEROPERABILITY REQUIREMENTS HAVE BEEN SATISFIED. REQUISITES FOR FUTURE PRODUCTION DECISIONS HAVE BEEN DEFINED AND COMPETITION HAS BEEN CONSIDERED THROUGH SECOND SOURCE, ETC PLANNING FOR DEPLOYMENT IS ADEQUATE INCLUDING MANPOWER AND TRAINING LOGISTICS READINESS AND OPERATIONAL CONSIDERATIONS INCLUDING INTEGRATION WITH EXISTING OPERATIONAL SYSTEMS ASSESSMENT OF SUPPORT SUBSYSTEMS TO MEET NEEDS OF INITIAL OPERATIONAL UNITS AND PLANNING TO MEET ANY DEFICIENCIES PRODUCTION READINESS REVIEW COMPLETED. CONTRACTOR HAS ADEQUATE CAPABILITY TO MANUFACTURE THE SYSTEM SUFFICIENT RESOURCES ARE OR CAN BE PROGRAMMED OVER THE LIFE OF THE SYSTEM. ALL OF THE SIGNIFICANT DESIGN PARAMETERS HAVE BEEN ADEQUATELY ADDRESSED WITH SOLUTIONS IN HAND AFFORDABILITY OF PRODUCTION AND OPERATIONS AND MAINTENANCE PROGRAM BY FULL FUNDING IN FYDP		MONITORS SERVICE DECISION AS TO WHEN SYSTEM IS READY TO BE DEPLOYED TO USING ACTIVITIES.

7

[OPERATIONS AND SUPPORT (O & S)]		

ABBREVIATIONS

ACP	AREA COORDINATING PAPER
ASD(C)/MPT	ASSISTANT SECRETARY OF DEFENSE (COMPTROLLER)
ASD(C³I)	ASSISTANT SECRETARY OF DEFENSE (COMMUNICATIONS, COMMAND, CONTROL AND INTELLIGENCE)
ASD(PA&E)	ASSISTANT SECRETARY OF DEFENSE (PROGRAM ANALYSIS AND EVALUATION)
ASD(MRA&L)	ASSISTANT SECRETARY OF DEFENSE (MANPOWER, RESERVE AFFAIRS AND LOGISTICS)
OASD/S	OFFICE OF THE ASSISTANT SECRETARY GENERAL FOR DEFENSE SUPPORT
CNAD	CONFERENCE OF NATIONAL ARMAMENTS DIRECTORS
DAE	DEFENSE ACQUISITION EXECUTIVE
DCP	DECISION COORDINATING PAPER
DSARC	DEFENSE SYSTEMS ACQUISITION REVIEW COUNCIL
DTC	DESIGN-TO-COST
LCC	LIFE-CYCLE-COST
MAS	MISSION AREA SUMMARY
MND	MISSION NEED DOCUMENT
MOU	MEMORANDUM OF UNDERSTANDING
MS	MILESTONE
NADDC	NATO DESIGN AND DEVELOPMENT DIRECTIVE
NADI	NATO NATIONAL DISENGAGEMENT INTENTION
NAPR	NATO ARMAMENTS PLANNING REVIEW
NIAG	NATO INDUSTRIAL ADVISORY GROUP
NISEG	NATO IN-SERVICE GOALS
NST	NATO STAFF TARGET
NSTT	OUTLINE NATO STAFF TARGET
NAPS	PERIODIC ARMAMENTS PLANNING SYSTEM (NATO)
POM	PROGRAM OBJECTIVES MEMORANDUM
PPBS	PLANNING PROGRAMMING BUDGETING SYSTEM
SAR	SELECTED ACQUISITION REPORT
SDDM	SECRETARY OF DEFENSE DECISION MEMORANDUM
SECDEF	SECRETARY OF DEFENSE
SOW	STATEMENT OF WORK
TAA	TECHNOLOGY ASSESSMENT ANNEX
TAD	TECHNOLOGY AREA DESCRIPTIONS
TCP	TECHNOLOGY COORDINATING PAPER
TOR	TERMS OF REFERENCE
USD(R&E)	UNDER SECRETARY OF DEFENSE (RESEARCH AND ENGINEERING)

JULY 1981

SEND SUGGESTIONS & RECOMMENDED CHANGES TO:

COMMANDANT
DEFENSE SYSTEMS MANAGEMENT COLLEGE
ATTENTION: DSMC-DRI-R
FORT BELVOIR, VA. 22060

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DOD COMPONENT (SERVICE)	OUTPUTS	MISSION AREA ANALYSES. MISSION ELEMENT NEEDS STATEMENT (MENS RECOMMENDATION FOR APPROVAL OF THE PROGRAM AND REQUEST AUTHORITY TO PROCEED.
	RESPONSIBILITIES	CONDUCT ANALYSIS OF MISSION AREAS IDENTIFY AND DEFINE MISSION ELEMENTS NEEDS MINIMIZE THE TIME FOR NEED IDENTIFICATION ANALYZE MISSION RECONCILED WITH OVERALL CAPABILITIES PRIORITIES AND RESOURCES
CONTRACATOR (S)	OUTPUTS	
	ACTIVITIES	

6

...SION NEED ANALYSES, CONCEPTS OF OPERATION AND MISSION NEED TRANS... ...IDENTIFY FUNCTIONAL PERFORMANCE REQUIREMENTS	...ED AMENDING PREFERRED ALTERNATIVES, IDENTIFICATION OF EXISTING ... IN COMMERCIAL OR MODIFIED MATERIAL, OR MILITARY, INCLUDING ... DEVELOPMENT CONSIDERATIONS OR RESEARCH PROGRAM INCLUDING ... OCCURRENCE OF SINGLE SYSTEM, PROJECT, SUBSYSTEM, AND/OR PROJECT ... SUCCESSFUL DEVELOPMENT SAMPLE SELECT DOCUMENTS USED FOR ONE PROGRAM	...DETERMINE MISSION ELEMENT TASK WITH UPDATED THREAT ...IDENTIFICATION OF SYSTEM(S) AND SUBSYSTEM(S) PERFORMANCE, ACTIVITY ... AND FUNCTIONAL INTERFACES AND SELECT PREFERRED SYSTEM ...SESSION OF RISK RESOLUTION AND TRADE-OFF ACTIVITY ...REQUIREMENTS FOR SINGLE ITEMS AND TOTAL LIMITED PRODUCTION ... CONSIDERATION AND PRODUCTION COSTS ...SELECTED PROPERTIES FOR MILESTONE III PRODUCTION OF ... SUPPORTING OPERATIONS AND SUPPORT ...IDENTIFIED TRADE-OFF AREAS ... INTERMEDIATE LEVEL ... REQUIREMENTS ...ALTERNATIVES AND RISKS HAVE BEEN IDENTIFIED, ARE ACCEPTABLE ... ...AND TO ADDRESS THEM IS COMPLETE ...ALL DEVELOPMENTS HAVE BEEN ACCEPTED ...ALL TRADE PROPOSALS FROM INDUSTRY ... HAVE BEEN RECEIVED, ...PROPERLY INSTALLED ...ALL PRODUCT SPEC. AND SITE PACKAGE ... REQUIREMENTS ARE READY ... ...AND USER, ETC. ...PHASE 3 ACQUISITION STRATEGY FOR THE ... ENGINEERING ... ...TEST PHASE, BROAD PRODUCTION AND ... ACTIONS ... UPDATED	...UPDATE ... FOR ... MMED... ...DEVELOPMENT ... ...OF ... ...
...INTAINING ANALYSIS OF ASSIGNED MISSION RESPONSIBILITIES IN MISSI... ...AS ...ANAGE EXPLORATION, IDENTIFICATION AND DEVELOPMENT OF ALTERNATIVE ...SYSTEM CONCEPTS TO MEET MISSION ELEMENT TASKS ...NSIDER MODIFICATION OR PRODUCT IMPROVEMENT OF EXISTING SYSTEMS ...NSIDER USE OF AVAILABLE SUBSYSTEMS AND EXISTING MILITARY AND ...MMERCIAL HARDWARE AND SOFTWARE ...NSIDER NEEDS OF OTHER DOD COMPONENTS, AND PATH STANDARDIZATION AND ...INTEROPERABILITY REQUIREMENTS AND MAXIMIZE COLLABORATION WITH ... ...ESS PROGRAM RISK AREAS AND CONDUCT TRADE-OFFS IN PERFORMANCE, COST ... SCHEDULE TO ACHIEVE BEST BALANCE FOR ALTERNATIVES ...NSIDER ALTERNATIVE MAINTENANCE CONCEPTS TO IDENTIFY IMPACT ON ...SUPPORT, DESIGN AND RESOURCES PREPARE TSA IDENTIFYING AREAS OF TECHNOLOGY RISK REMAINING IN THE ...OGRAM ...FEASIBILITY CONSIDERATIONS SHALL BE INCLUDED IN THE EVALUATION OF ...ALTERNATIVE DESIGN CONCEPTS TO DETERMINE PROMISING AREAS AND THE ...ACTIONS NECESSARY TO ELIMINATE THOSE RISKS ...EVELOP ACQUISITION STRATEGY WHICH INTEGRATES TECHNICAL, BUSINESS AND ...MANAGEMENT PROGRAM ELEMENTS ...EVELOP PROGRAM MANAGEMENT CONSTRAINTS ON SELECTED PROGRAM THRUSTS ...FOR EACH ALTERNATIVE ...EVELOP RESOURCE PROJECTIONS IN TERMS OF PROGRAM OBJECTIVES AND ...CONSTRAINTS PREPARE DCP BASED ON APPROVED AND OUTLINE RECOMMENDED PREFERRED ...ALTERNATIVE CONCEPTS ...EVELOP SYSTEM SPECIFICATIONS ...EVELOP TECHNOLOGY BASE	...SERVICE SYSTEM ACQUISITION REVIEW COUNCIL (SASARC) (SARC) (ARSARC) ...REVIEW PROGRAMS AND ADVISE THE SERVICE SECRETARY CONCERNING ACQUI... ...DECISIONS OF THE SECRETARY OF DEFENSE (REVIEWED BY THE DSARC) FOR ... ...APPROVAL TO PROCEED INTO THE DEMONSTRATION/VALIDATION PHASE. ...FOR MAJOR PROGRAMS ...SARC (CHAIRED BY THE SAME AS FOR DSARC) ...ARSARC (CHAIRED BY ASSISTANT SECRETARY (RESEARCH, DEVELOPMENT AND ACQUISITION))	DEVELOP COMPLETE AND UNAMBIGUOUS SET OF REQUIREMENTS. DEVELOP AND IMPLEMENT DEVELOPMENT SPECIFICATIONS. IMPLEMENTATION OF PROGRAM, AS SPECIFIED IN THE DCP AND APPROVAL ... MEMORANDUM REPORTING OF PROGRAM PROGRESS, AND ANY ANTICIPATED BREACH OF MANAGEMENT CONSTRAINTS CONTRACTOR SELECTION AND PROGRAM IMPLEMENTATION, IN ACCORDANCE WITH ACQUISITION STRATEGY DEVELOP OTC AND LCC GOALS. COMPLETE THE DEMONSTRATION/VALIDATION TESTING AND EVALUATIONS, AS SPECIFIED IN DCP IDENTIFY ELECTRONIC, INFRARED/OPTICAL COUNTERMEASURE PERFORMANCE REQUIREMENTS, AS APPLICABLE CONTINUE MISSION ANALYSES CONDUCT SYSTEM REQUIREMENTS REVIEW (SRR) AND SYSTEM DESIGN REVIEWS (SDR) PREPARE TSA IDENTIFYING AREAS OF TECHNOLOGY RISK REMAINING IN THE PROGRAM.	SERVICE SYSTEM ACQU... SECRETARY CONCERNING ... (SARC) FOR APPROVAL ... DCP DOCUMENTATION FOR SERVICE SARC DECISI SERVICE SECRETARY IF
...MENT FUNDED SUPPORT FOR CONTRACTS PROPOSALS INDEPENDENT RESEARCH AND DEVELOPMENT EFFORT (IR&D) ... STUDY ... ...SUPPORT COMPANY-SPONSORED BASIC RESEARCH EXPLORATION AND STUDY CONTRACTS CONCEPT DEFINITION CONTRACTS UNSOLICITED/SOLICITED PROPOSALS		RFP PROPOSALS COMPETITIVE ADVANCE DEVELOPMENT (ADV) CONTRACTS SOLE SOURCE ADVANCE CONTRACT SUBSYSTEM CONTRACTS AMENDED PROPOSALS	
...THESIS MODELS AND ANALYSES ...TECHNOLOGY AND SYSTEM APPLICATIONS ...APPROVAL FOR ADVANCED DEVELOPMENT ...SCALE EXPERIMENTAL RESEARCH ...COST AND TRADE-OFF STUDIES WITH CONFIGURATION DEFINITIONS ...SYSTEM SPECIFICATION ...MODELS AND ESTIMATES 10		FEASIBILITY DEMONSTRATIONS OF HIGH RISK SUBSYSTEMS PROTOTYPES, BREADBOARDS, ETC. DETAILED SYSTEM DESCRIPTION PROPOSALS FOR FULL-SCALE ENGINEERING DEVELOPMENT VALIDATION OF COST ESTIMATES ASSEMBLY OF SUBCONTRACT TEAMS. ...VANCE PRODUCTION AND LOGISTIC PLANS SUBSYSTEM SPECIFICATIONS	

...ESTABLISHED AND ESTABLISHED AND IN EXISTENCE THE TEST AND EVALUATION MASTER PLAN (TEMP) IDENTIFIES AND INTEGRATES THE TESTING AND EVALUATION TO BE ACCOMPLISHED PRIOR TO THE MILESTONE III PROGRAM DECISION POINTS REQUISITES FOR THE MILESTONE III PRODUCTION AND DEPLOYMENT DECISION INCLUDING OPERATION AND LOGISTICS SUPPORT HAVE BEEN ESTABLISHED THE PROGRAM MANAGEMENT STRUCTURE AND PLANS ARE SOUND AND UPDATED AS APPROPRIATE SUFFICIENT RESOURCES ARE PLANNED OR PROGRAMMED OVER THE LIFE OF THE SYSTEM ALL REQUISITE ACTIONS FOR PRODUCTION PROGRAM BY FULL FUNDING IN THE FYDP		7	
...STATE OF RECOMMENDED SELECTED SYSTEMS FOR FULL-SCALE ENGINEERING DEVELOPMENT AND PRODUCTION ...OF DEFICIENCIES REQUIRING CORRECTION PRIOR TO PRODUCTION	REAFFIRM MISSION ELEMENT TASK WITH UPDATED THREAT TRADE OFFS OF COST/SCHEDULE/PERFORMANCE COMPLETE AND DETAILED SYSTEM DEFINITION - THE SYSTEM AND SUBSIDIARY SPECIFICATIONS, DRAWINGS AND ASSOCIATED DOCUMENTATION FOR THE SUBSYSTEMS AND CRITICAL COMPONENTS, AS WELL AS THEIR INTERFACES TEST AND EVALUATION RESULTS SUPPORT PRODUCTION DECISION KPP AND JCC GOALS REFINED PRODUCTION, TRAINING AND LOGISTICS SUPPORT PLANS WITH ACHIEVEMENT MILESTONES DATA STANDARDIZATION AND INTEROPERABILITY REQUIREMENTS ARE SATISFIED A FIRM AND ACCEPTABLE PROPOSAL WITH OPTIONS, IF APPROPRIATE, FOR THE PRODUCTION AND DEPLOYMENT OF THE SYSTEM COMPLETED PRODUCTION READINESS REVIEW AN UPDATED NDI	UPDATE DCP, RECOMMENDING SELECTED SYSTEM FOR PRODUCTION AND DEPLOYMENT AND COMMITMENT TO QUANTITY PRODUCTION AND DEPLOYMENT OF THE SYSTEM POM AND FYDP INCLUDES FULL FUNDING FOR PRODUCTION AND OPERATIONS AND MAINTENANCE	PREPARE FOR WEAPON SYSTEMS APPROPRIATE DEFICIENCIES IMPROVEMENTS ACQUISITION STRATEGY THAT ... GLOBAL COMPETITION ... ... & REPLACEMENT ... AND TRAINING PLANS QUARTERLY REPORTS TO ... BODIES SELECTED REPORTS TO BE DEF... SELECTED ACQUISITION REPORT INFORM DEFENSE ACQUISITION ACTIONS CONTROL ECPs CONTINUING MISSION ANALYSES
SERVICE SYSTEM ACQUISITION COUNCIL REVIEWS PROGRAM, ADVISES SERVICE SECRETARY CONCERNING RECOMMENDATIONS TO THE SECDEF VIA REVIEW BY OSARC FOR APPROVAL TO PROCEED INTO FULL-SCALE ENGINEERING DEVELOPMENT DCP DOCUMENTATION FOR MAJOR PROGRAMS SERVICE OSARC DECISION CRITERIA ARE THE SAME AS FOR THE OSARC SERVICE SECRETARY OR UNDER SECRETARY CHAIRS THE SERVICE SARC	IMPLEMENTATION OF PROGRAM IN ACCORDANCE WITH APPROVED DCP REPORT PROGRAM STATUS AND KEY ACTIVITIES BRIEFS TO THRESHOLDS IMPLEMENTATION OF TOTAL PROGRAM IMPLEMENTATION OF PRODUCTION, INDUSTRIAL ENGINEERING, LOGISTICS SUPPORT AND DEPLOYMENT PLANNING PROCUREMENT LIMITED PRODUCTION CONTRACT ADMINISTRATION CONTINUING ACQUISITION STRATEGY CONTINUING ACQUISITION ASSESSMENT REVIEW CONTINUING FINANCIAL AND COMPLIANCE AUDITS EXECUTE PROGRAM MANAGEMENT PLAN CONTINUE TRAINING EXECUTE NEW REQUIREMENTS TO SUPPORT PRODUCTION SCHEDULES DETERMINE OPTIMAL RATES, SCHEDULES AND RATES CONTRACTOR SELECTION UNDER CONTRACT ACCEPT	SERVICE SYSTEM ACQUISITION REVIEW COUNCIL (SSARC) REVIEWS PROGRAM ADVISES SERVICE SECRETARY CONCERNING RECOMMENDATIONS TO THE SECDEF VIA REVIEW BY OSARC FOR APPROVAL TO PROCEED INTO PRODUCTION AND DEPLOYMENT DECISION COORDINATING PAPER DCP FOR MAJOR PROGRAMS SSARC DECISION CRITERIA ARE THE SAME AS FOR THE OSARC SERVICE SECRETARY OR UNDER SECRETARY CHAIRS THE SSARC	CONTRACTOR SELECTION EXECUTION OF PRODUCTION PHA... CONTROL OF ECPs DoD COMPONENT HEAD QUARTERLY ... SELECTED ACQUISITION REPORT INFORM DEFENSE ACQUISITION ACTIONS AS PROGRAM PROGRESS CONTINUING MISSION ANALYSES
	REP PROPOSAL ...DEVELOPMENT CONTRACTS ...DEVELOPMENT CONTRACTS LRIP LIMITED PRODUCTION CONTRACTS ...OF INITIAL ITEMS		RFQ (RESPONSE) ECPs PRODUCTION CONTRACTS ENGINEERING SERVICES CONTRACTS SERVICES, OPERATIONAL TEST TRAINING EQUIPMENT SERVICES FOREIGN SALES EFFECTIVE DATE FUNDED FUTURE APPLICATION ... COMPANY FUNDED CONSTRUCTION ... COMPANY-FUNDED MARKETING ...
	ENGINEERING DEVELOPMENT COMPLETED PRODUCTION DEVELOPMENT TEST AND QUALIFICATION (DT&E) THROUGH LIVE FIRE TESTS, GROUND AND FLIGHT TESTS, DETAIL VALIDATE, ETC. PRODUCTION TYPE HARDWARE OR SERVICE TESTING, THE ANALYSES OF PRODUCTION, ACCESS, AND ESTIMATES DEFICIENCY REPORTING SYSTEM PRODUCTION SURVEILLANCE VULNERABILITY ASSESSMENT PARAMETERS (INCLUDING SURVIVABILITY, VULNERABILITY, LETHALITY, AVAILABILITY, COMPATIBILITY, TRANSPORTABILITY, INTEROPERABILITY, RELIABILITY, MAINTAINABILITY, SAFETY, HUMAN FACTORS, ETC.) ASSESSED. COMPATIBILITY AND LOGISTICS SUPPORT-ABILITY HAVE BEEN CONSIDERED AND SOLUTIONS TO THESE PROBLEMS DETERMINED PRIOR TO PRODUCTION DECISION		PRODUCTION FACILITIES, INVEST... MANUFACTURING MACHINERY, ET... VALUE ENGINEERING SUPPORT OF USER T&E FIELD SUPPORT PRODUCTION HARDWARE TRAINING DEVICES, SIMULATORS SPARES FUTURE EXPANSION STUDIES/CA... FUTURE APPLICATION STUDIES/

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[illegible]	WEAPON SYSTEM PROVIDED TO USING ACTIVITIES OPERATIONAL USE INITIATED (IOC) PROVIDE TRAINING AND SUPPORT THE SYSTEM	
[illegible]	DECISION TO DEPLOY SYSTEM TO USING ACTIVITIES CONDUCTS DEPLOYMENT PHASE. QUARTERLY REPORTS TO SECDEF ON PROGRAM STATUS AND KEY ISSUES PROVIDES LOGISTIC SUPPORT AND TRAINING TO USING ACTIVITIES.	
RFQ/ RESPONSE) TOPS PRODUCTION CONTRACTS ENGINEERING SERVICES, CONTRACTS (e.g., SITE ACTIVATION SUPPORT SERVICES, OPERATIONAL TEST SUPPORT, FIELD SUPPORT, TRAINING SUPPORT) TRAINING EQUIPMENT/SERVICES CONTRACTS FOREIGN SALES DIRECT COMMERCIAL OR FOREIGN MILITARY SALES. UNSOLICITED RE-APPLICATION AND APPLICATION AND EXPANSION STUDIES COMPANY FUNDED UNSOLICITED PROPOSALS MEANS FUNDED MARKETING STUDIES	PRODUCT IMPROVEMENT CONTRACTS REFURBISHMENT CONTRACTS - (AS SYSTEM AGES) MAINTENANCE CONTRACTS - (e.g., WARRANTY SERVICES CONTRACTOR-OPERATED REPAIR FACILITIES). ENGINEERING SERVICES CONTRACTS (e.g., SITE ACTIVATION SUPPORT SERVICES, OPERATIONAL TEST SUPPORT, FIELD SUPPORT, TRAINING SUPPORT). FUNDED FUTURE APPLICATION AND EXPANSION STUDIES. COMPANY-FUNDED UNSOLICITED PROPOSALS. COMPANY-FUNDED MARKETING STUDIES.	
PRODUCTION FACILITIES INVESTMENT (e.g., HARD TOOLING, NEW MANUFACTURING MACHINERY, ETC.) ACTIVE ENGINEERING SUPPORT OF USER TGE FIELD SUPPORT PRODUCTION HARDWARE TRAINING DEVICES, SIMULATORS, AND USER TRAINING SPARES FUTURE EXPANSION STUDIES/CONTRACTS FUTURE APPLICATION STUDIES/CONTRACTS.	FIELD SUPPORT. SPARES FUTURE EXPANSION STUDIES/CONTRACTS. FUTURE APPLICATION STUDIES/CONTRACTS.	

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