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ARMAMENT ACQUISITION BY THE FRENCH MINISTRY OF DEFENSE
(U) OFFICE OF NAVAL RESEARCH LONDON (ENGLAND)
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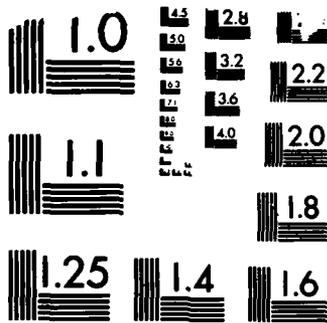
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R-8-83

OFFICE OF NAVAL RESEARCH

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ARMAMENT ACQUISITION BY THE FRENCH MINISTRY OF DEFENSE
EDITED BY LARRY E. SHAFFER
30 December 1983

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UNITED STATES OF AMERICA

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EXECUTIVE SUMMARY

France's Delegeue General Pour l'Armement (DGA) is responsible for the Ministry of Defense's acquisition policy. Armament orders corresponding to the defense budget (20,700 million francs in 1976) are divided between government industries (20 percent), para-public industries (30 percent), or private industries (50 percent). While in most economic sectors armament orders encourage innovation owing to the level of quality required, they represent the essential drive for the electronics, aerospace, and nuclear fields, in which the DGA has no production resources. Consequently, armament is the leading client of French professional electronics, providing it with 55 percent of its turnover. The DGA accounts for 70 percent of the aerospace industry, which employs 95,000 people, and it finances over 50 percent of the expenses of the Commissariat à l'Energie Atomique (CEA), or Atomic Energy Commission. Finally, armament finances 30 percent of the national effort in the field of research.

The DGA is made up of divisions that deal with personnel and administrative affairs, industrial affairs, international affairs, coordination of research, electronics, ground defense and combat materials, military and civilian aeronautical materiel, naval vessels, ballistic missiles, and inspection of products.

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ARMAMENT ACQUISITION BY THE FRENCH MINISTRY OF DEFENSE

1 INTRODUCTION

France encompasses about 213,009 square miles of territory, and is comparable in size to the states of Oregon and Nevada combined. It has a population of approximately 50 million people. The government is composed of three basic institutions--the executive, the parliament, and the courts.

French manufacturing industries compare favorably in volume, variety, and quality of output with those of other nations of Western Europe. Durable goods produced include automotive vehicles, airplanes, household appliances, machinery, and chemicals.

The country is a charter member of the North Atlantic Treaty Organization (NATO). However, in 1962 it decided to withdraw its military forces from active participation in NATO's military arm, but did maintain its membership in the civilian arm, the NATO Council.

On 22 May 1978, the governments of the United States and France approved a reciprocal Memorandum of Understanding (MOU) concerning principles governing mutual procurement of defense equipment. In addition, several specific program agreements or MOUs are in force or under way:

1. ROLAND--A short-range air defense system developed by France and Germany.

2. PATRIOT--A surface-to-air, medium- and high-altitude air defense system designed to counter the field army defense threat of the 1980s and 1990s. An MOU was signed on 15 January 1979.

3. SONOBUOYS--An aircraft-launched submarine acquisition system that deploys a sonic listening device which transmits signals to an aircraft, with simultaneous monitoring by shore-based facilities.

4. ERMIS--A project to develop explosive-resistant, multi-influence sweep system (ERMIS). France approved the MOU in September 1978. Other nations are participating.

5. NAVSTAR--A satellite-based, universal positioning and navigation system designed by the US to provide precise position information and time for accurate worldwide weapons delivery, and to reduce proliferation of navigation aids. This MOU was signed by nine NATO countries in April 1978.

6. ATLAS II--A program to develop and satisfy requirements for a near-term, day, laser-target designator for single-seat aircraft, such as the F-16.

Cooperative efforts are currently under way on several other projects; some of these are:

1. ASH--Advanced scout helicopter.
2. GSR/MLRS--General support rocket system/multiple launch rocket system.

3. ATGM--Anti-tank guided munitions.

4. NATO SEA GNAT--A ship-launched decoy system to protect against air- and sea-launched anti-ship missiles.

5. IRST--Shipboard infrared search and track system.

6. AMRAAM--Advanced medium-range air-to-air missile, which is being developed to replace the Sparrow AIM-7F missile.

7. AMMO Commonality--Standard families of ammo between 20- and 40-mm calibers.

8. Small Arms Ammo--Program to standardize small arms within NATO.

9. IFF--System for positive and reliable identification of friends or foes.

10. JTIDS--A joint tactical information distribution system.

2 ORGANIZATION OF THE DGA

France's Ministry of Defense (MOD) is organized as shown in Figure 1. Logistics functions are performed by the Delegeue General Pour l'Armement (the Director-General for Armaments, Figure 2). Operating defenses (military services) are under the direct control of the Minister of Defense; however, they receive staff direction from the Chef d'Etat-Major des Armees, which is roughly comparable to the DOD Joint

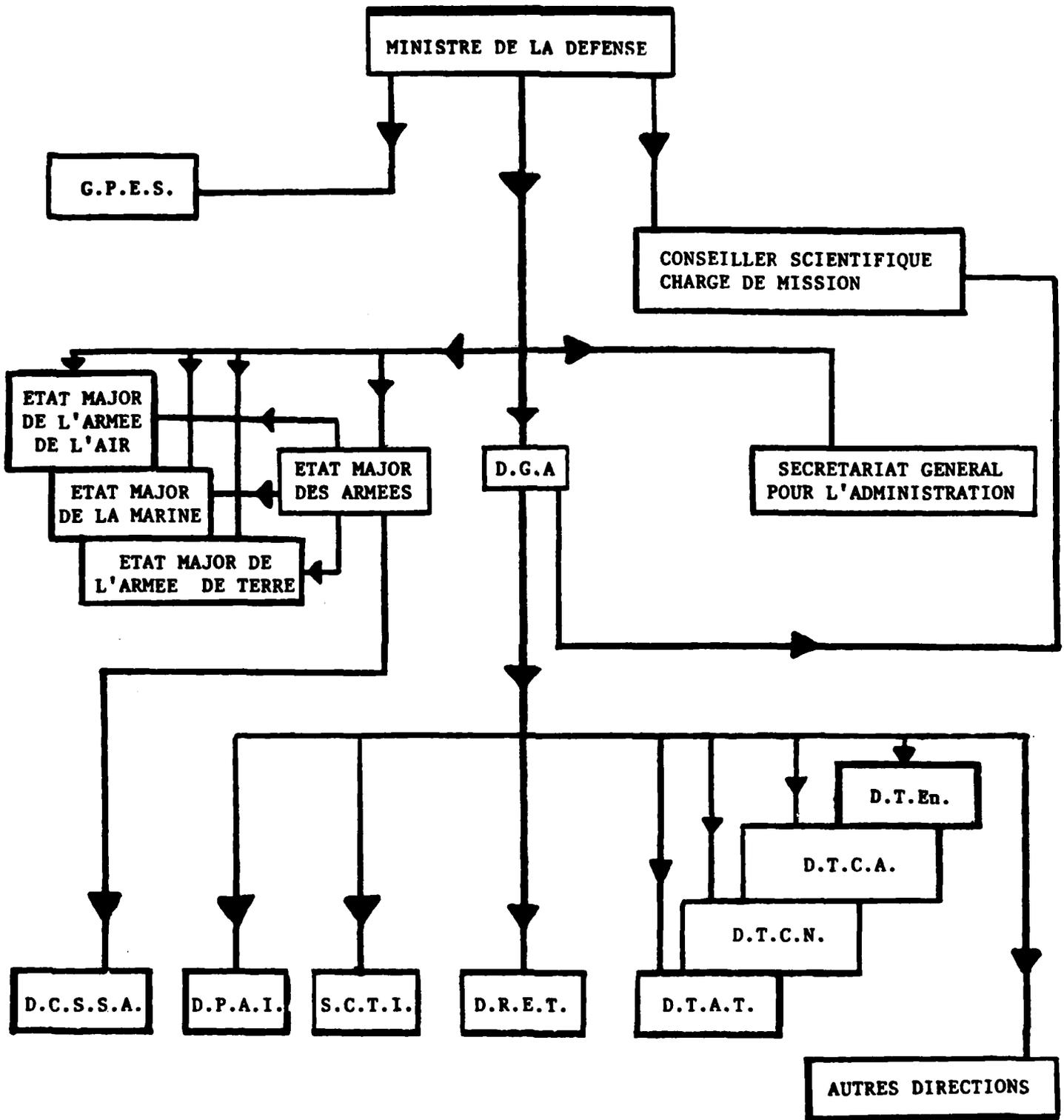


Figure 1. French Ministry of Defense

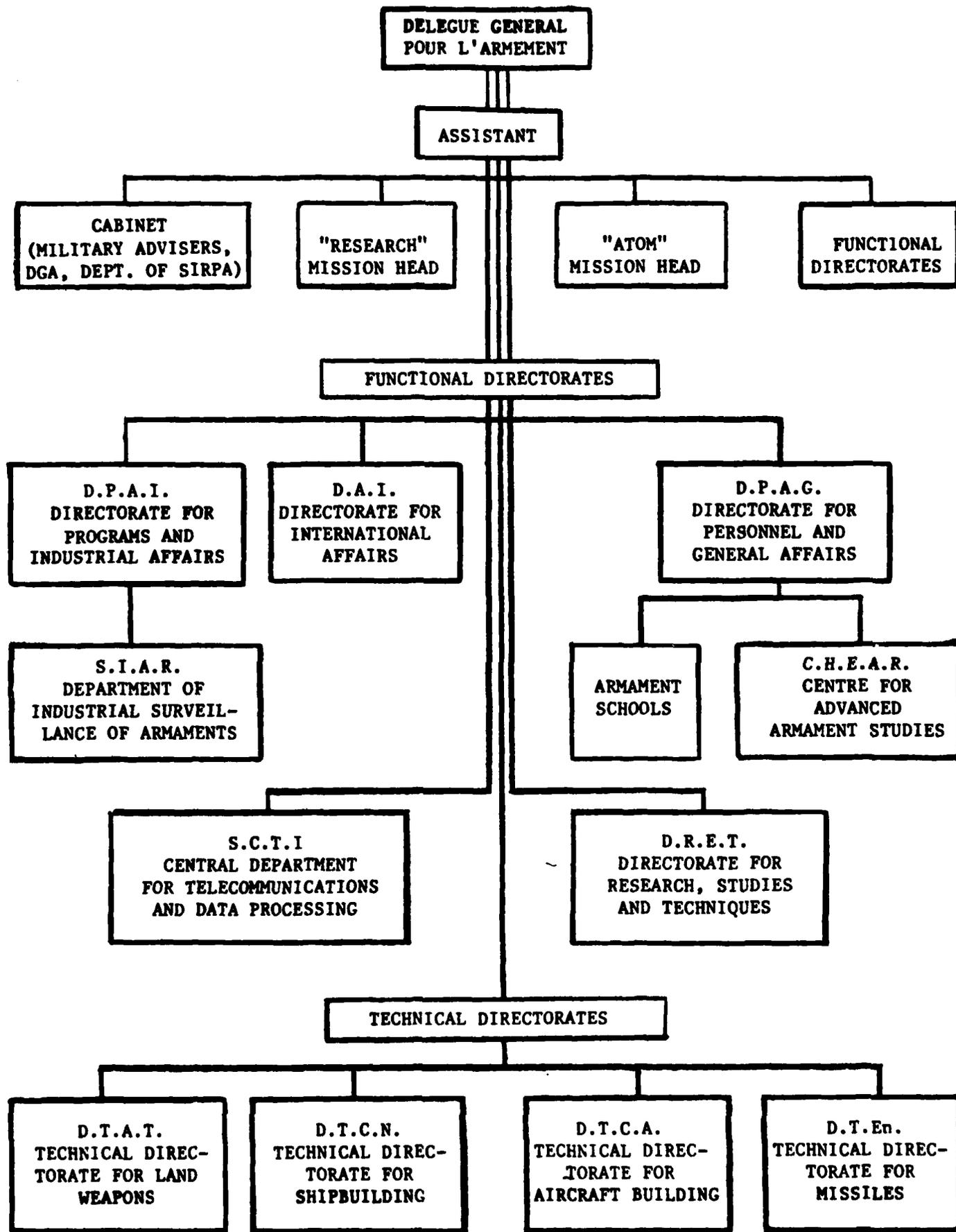


Figure 2. Organization of the DGA

Chiefs of Staff (JCS). The Secretaire General Pour Administration makes up the other major division of the ministry; several staff and specialized functions are also included: Direction de la Securite Militaire (Director for Military Security); Direction de la Gendarmerie et de Justice Militaire (Director of the Military Police and Justice); Direction des Centres d'Experimentations Nucleaires (Director for Central Nuclear Experiments); and the Service de Documentation Exterieur et de Contre-Espionnage (Service for External Documentation and Counterespionage).

The Director-General for Armaments (DGA) has overall responsibility for MOD acquisition policy and management. Basically, the directorate is subdivided into two main areas of interest: Functional (policy management) and Operational (service-oriented contracting). Before moving to a discussion of each principal unit of the DGA, let us consider exactly what the armament industry represents to the government of France.

Armament orders corresponding to the defense budget (20,700 million francs in 1976) are divided between government industries (20 percent), para-public industries (30 percent), or private industries (50 percent).

While in most economic sectors armament orders encourage innovation owing to the level of quality required, they represent the essential drive for the electronics, aerospace, and nuclear fields, in which the DGA has no production resources. Consequently, armament is the leading client of French professional electronics, providing it with 55 percent of its turnover. The DGA accounts for 70 percent of the aerospace industry, which employs 95,000 people, and it finances over 50 percent of the expenses of the Commissariat à l'Energie Atomique (CEA), or Atomic Energy Commission. Finally, armament finances 30 percent of the national effort in the field of research.

Direction des Personnels et des Affaires Generales (DPAG)

This element has overall management of personnel, develops the employment policy, and allocates manpower to the various departments of the directorate. It is charged with recruiting and training executive military personnel and technical staff. The DGA has a comprehensive development program for its personnel.

Direction des Programmes et Affaires Industrielles

The activities of the Direction des Programmes et Affaires Industrielles de l'Armement (DPAI) are concentrated in three areas which complement each other: programs and scheduling, industrial activities, and purchasing conditions.

In the programming area, the DPAI participates for the entire DGA in preparing programs for the design and implementation of weapon systems and armament equipment programs; in drawing up financial plans, program laws, and annual budgets; and in following up their execution. The DPAI also prepares program laws and annual budgets for the entire Ministry of Defense. The DPAI works with the Chiefs of Staff and the General Secretariat for Administration to carry out the syntheses of program cost evaluations and to develop scheduling techniques and procedures, working in particular on the tricky and complex mechanisms of price increases of armaments.

In the area of industrial affairs, DPAI activities encompass the entire industrial armament potential--whether of state, para-public or private origin. The DPAI exercises the supervisory powers entrusted to the DGA on public establishments or national companies which are subjected to it.

Based on studies concerning the armament industry's structures, its human equipment and financial resources, and its provisional workload schedules, the DPAI prepares the decisions of the

DGA and of the Minister of Defense. Various factors are taken into account--e.g., industrial policy, management methods, investment programs, state establishment activities, and state orders. The DPAI attempts to place in the best possible position--nationally and internationally--the firms of the para-public and private sectors considered necessary for France's policy of armament procurement.

Finally, the DPAI is responsible for coordinating surveys to improve pricing on contracts outside the DGA.

Consequently, the DPAI is a synthesizing body capable of: (1) analyzing overall problems raised by the management of France's armaments, and (2) proposing long-term actions for improving DGA's effectiveness. Because the DPAI acts as coordinator between all the bodies making up the DGA, it sets forth and defends the viewpoints of the DGA for the other bodies of the Ministry of Defense and the other ministerial departments.

Direction des Affaires Internationales (DAI)

The activity of the DAI covers control of international commerce for war equipment, export of armaments, technical assistance to countries equipped with French material, and international cooperation in the field of armaments.

The DAI ensures the control of international commerce related to war equipment and similar equipment. To do this:

1. It submits to the Commission Interministerielle Pour l'Etude des Exportations de Matériels de Guerre (CIEEMG) the requests received from industry to negotiate and sign export sales contracts;
2. It looks into the authorizations for export, import, and transit of war equipment and similar equipment, on behalf of the Ministry of Defense;
3. It participates in the control of governmental decisions about the export of war equipment.

The DAI must decide whether to approve the export of war equipment. Exporting makes it possible to maintain a national armaments industry capable of producing equipment for the French armies under tolerable economic conditions because it regularizes production, increases productivity, and allows reinvestment to be achieved.

The DAI contributes to the development of exports:

- By its interventions with governments of foreign countries,
- By its interventions with the French administrations concerned,
- By the negotiation of protocols for technical assistance in the set-up of equipment and possibly of industrial or even coproduction compensation agreements.

Moreover, the development of exports has brought to light the need to provide after-sales service and, frequently, to combine sales with appropriate military assistance. The DAI has organized itself so that it can guide and coordinate these external assistance operations which involve the action of exporting industries, Chiefs of Staff, and specialized service companies. The bonds created during personnel training are important because each year France receives a significant number of foreign military trainees and sends many specialists abroad.

France believes that international cooperation is becoming necessary for European countries. Certain weapon systems are technically complex and expensive to design. Producing them to meet limited national requirements may be beyond the capabilities of a country working alone. Producing equipment cooperatively means that predetermined conditions must be met. Politicians must want cooperation, the states must trust each other, and the industrial sector must be willing to accept a certain interdependence. The ideas of Chiefs of Staffs must be as similar as possible--so that before any decisions are made there are very active exchanges

at the level of users and technical departments. This helps ensure that the common product is perfectly defined. Experience has taught the French that successful cooperation is achieved with a limited number of partners. For such projects to be successful, there must be organizations that ensure single command and responsibility:

1. A bi- or multi-partite board of directors whose competence must be limited to fundamental options alone;
2. A national authority in charge of performing the program;
3. A prime industrial contractor of the same nationality--a contractor who ensures leadership and selects a main partner from each of the other cooperating countries.

Direction des Recherches, Etudes et Techniques (DRET)

The DRET is responsible, under the authority of the DGA, for the following:

1. Ensuring the coordination of research and study programs upstream of developments,
2. Carrying out the part of programs entrusted to the Research Department of the DRET,
3. Making sure that the results of research and studies are transferred to their applications, and participating in drawing up the program concerning exploratory developments,
4. Evaluating the consequences of the evolution in science and technology on the direction taken by the nation's armament policy,
5. Satisfying army requirements concerning scientific information,
6. Promoting and coordinating actions whose aim is to improve the quality and lower the cost of armaments, and to implement modern technologies useful to defense,
7. Performing design work for future weapon systems,
8. Meeting army requirements in operational research.

The following are part of DRET:

1. The Service des Recherches (SDR) for research,
2. The Centre d'Etudes Theoriques de la Detection et des Communications (CETHEDEC) for theoretical studies in communications and detection,
3. The Bureau d'Information Scientifique (BIS) for scientific information,
4. The Service d'Etudes et Techniques (SET) for technical design studies,
5. The Centre Interarmees de Recherche Operationnelle (CIRO) for operational research,
6. The Etablissement Technique Central de l'Armement (ETCA), and
7. The Centre de Documentation de l'Armement (CEDOCAR) for armament documentation.

The DRET also ensures Ministry of Defense supervision of the Office National d'Etudes et de Recherches Aerospatiales (ONERA) and the Institut de Recherches Franco-allemand of Saint-Louis (ISL).

In liaison with the DAI, the DRET is in contact with public, private, foreign, or international organizations involved in research. It prepares, with the DPAI, the proposals for industrial policy directions to be followed in research and design studies upstream of armament developments.

Because of its very specific nature within the DGA and the armies, the DRET lies at the crossroads of army requirements in the field of advanced techniques and of ideas emanating from all scientific circles in the country. It is called upon to play an intermediate role in the dialogue between these circles, the part of an organizer responsible for following up and promoting the development of research still at the laboratory stage. The goal is to apply the research to future weapon systems. This is a complex and difficult task which can only be achieved by personnel having received, from the

outset, multidisciplinary training and accustomed to teamwork (armament engineers, officers from all branches, high-level scientists, health department personnel, and research staff).

Service Central des Telecommunications et de l'Informatique (SCTI)

Technical advances have led the French military services to acquire more and more complex and costly electronic equipment. Moreover, electronics is the basis for most testing, measurement, and inspection equipment and plays a major role in research. The problems encountered in designing, developing, and producing electronic equipment for the military services are interlinked; thus the steps require coordination. SCTI is responsible for defining and implementing an industrial policy for the production of electronic equipment for armament. SCTI operates mainly at the technical and industrial policy levels. On the technical level, the SCTI manages the design and development of electronic equipment:

1. By coordinating not only the efforts of the various technical directorates, but also those of the DGA, the Chiefs of Staff, and other ministries.

2. By defining the work to be done, including the technical choices to be followed up with a few companies. This limits investments in manpower and equipment to a certain number of sectors in which it is necessary to maintain independence.

When the work has been defined, the SCTI provides financing for "medium-term" design. Control of this funding allows the SCTI to supervise the setting up--in the DGA departments and industry--of the resources and skills needed to do the work. The SCTI is assisted by the work of specialized coordination groups. The SCTI is responsible for standardizing electronic equipment components and organizes activities in this regard.

On the industrial policy level, the SCTI defines and proposes an overall policy. To do so:

1. It follows the evolution of the electronics industry potential,

2. It studies problems having industrial implications (workload schedule, and effects of regulations, for example),

3. It prepares and submits to the DGA industrial policy actions related to the entire electronics sector, to a specific technical field, or to a company,

4. It supervises (in liaison with the DPAI, where it acts as interface for electronics) the installation of foreign electronics firms on French territory (studying files coming from the Ministry of Finance). And it oversees foreign participation in the capital of French electronics firms.

On the international level, the SCTI, in liaison with the DAI:

1. Encourages the activities of international cooperation groups in the field of electronics, and

2. Contributes to the various actions relative to exports (financial aid from the state, control of expansion activities involving the French electronics industry for armaments).

Connected to the SCTI, the Centre d'Electronique de l'Armement (CELAR) is an establishment with an inter-army role. The Centre de Calcul Scientifique de l'Armement (CCSA) is a large division of this establishment. The tasks of the CELAR include:

1. Test and evaluation of electronic equipment and assemblies in a land or simulated environment. The CELAR also performs a "technical watch" on communications systems for satellites;

2. Evaluation of weapon systems by means of simulation techniques using computers;

3. Operation of a data processing advisory department with various departments and establishments of the DGA and, more generally, with the armies.

The CCSA's mission is to make available to defense organizations a powerful assembly of calculation resources and related services.

Direction Technique des Armements Terrestres (DTAT)

The DTAT is mainly responsible for design, technical tests, and equipment manufacture for ground defense and combat materiel. It manufactures, in conjunction with other DGA directorates, the weapon systems for which it is responsible, and participates in the production of weapon systems with which it is associated. It provides technical assistance following commissioning of the equipment that it has delivered and does industrial repairs.

In its capacity of Public Power, the DTAT is the center for the Army Chief of Staff's interests. It seeks within its establishments or within industry the best ways to carry out its armament programs. As a supplier, it designs, develops, manufactures, and repairs equipment and weapon systems.

To fulfill these government and industrial tasks, the DTAT has significant manpower and equipment resources:

1. 21,000 people, including 1000 engineers, 2500 technicians, 15,000 workers, and 2500 executive and administrative personnel.

2. A ground surface area of 11,500 hectares, for the most part used for testing and as firing ranges.

3. Buildings whose developed surface area reaches 2 million square meters.

4. A stock of 12,500 machines.

This entire complex comprises 18 centers: a Direction Centrale, a Service Central des Commandes (SCC) for order centralization, a Centre d'Enseignement (ESAT) for training, four technical and test centers, and 10 industrial establishments.

For the industrial sector, in January 1971 the studies and production facilities were grouped in the Groupement Industriel des Armements Terrestres (GIAT); there are 10 of these establishments. Their work is the result of a deliberate policy for restructuring and concentrating industrial resources to adapt the tool to requirements: decreasing requirements since the last world war in conventional ammunition and weapons, and increasing requirements in more sophisticated equipment. The 10 industrial facilities of the GIAT and their activities are as follows:

1. AMX/APX: Etablissement d'Armement AMX/APX, located at Statory; design of armored equipment; prospects, design and feasibility studies of weapon systems or component parts (fire control, optical equipment).

2. EFAB: Etablissement d'Etudes et Fabrication d'Armement de Bourges; design of artillery, medium-size infantry weapons and ammunition; production of artillery; reconstruction of wheeled vehicles; pyrotechnics.

3. ASS: Atelier de Chargement de Salbris; loading of ammunition and missiles.

4. ARS: Atelier de Construction de Rennes; manufacture of ammunition components, equipment for the support of armored vehicles in the field.

5. ARE: Atelier de Construction de Roanne; production of armored vehicles and spares, and vehicle repairs.

6. ATS: Atelier de Construction de Tarbes; production of large- and medium-size mechanical parts, platework, turrets, shells, and pyrotechnics.

7. ALM: Atelier de Fabrication du Mans; industrialization and manufacture of small-caliber ammunition.

8. ATE: Atelier de Fabrication de Toulouse; industrialization and manufacture of 9- to 30-mm caliber ammunition

9. MAS: Manufacture Nationale d'Armes de Saint-Etienne; design and production of light infantry weapons; antitank rockets and weapons; protection devices against nuclear and chemical agents.

10. MAT: Manufacture Nationale de Tulle; manufacture of automatic 20-, 30-, and 35-mm medium-caliber weapons.

The potential of the GIAT--together with its turnover, which approaches 3000 million francs--makes this industrial complex an economic force. Its investments can be compared with those of the mechanical engineering industry (on the order of 6 percent of its turnover). Its enormous potential is managed through economic competitiveness and independent industrial accounting.

Direction Technique des Constructions Aeronautiques (DTCA)

The Direction Technique des Constructions Aeronautiques (the French Air Force) has an essentially public activity. It has industry carry out the design studies, prototypes, production runs, and certain repairs for military and civilian aeronautical materiel and associated ground equipment ordered by the government. These tasks are shared by three departments: aeronautical technical service (STAE) 300, aeronautical production service (SPAC) 270, and technical service for air telecommunications (STTA) 300.

The DTCA is the technical expert for all air materiel, whether or not ordered by the government. It is in charge of carrying out and using tests that make it possible to deliver certificates of airworthiness or to verify that equipment conforms to the technical clauses of contracts. DTCA is also in charge of working out technical regulations. This role is carried out through technical departments and three test centers: the flight test center having its main bases at Bretigny, Cazaux, and Istres (CEV), 3000 people; the power-plant test center at Saclay (CFP), 1200 people; and the aeronautical test center at Toulouse (CFAT), 1200 people.

These facilities do official tests on equipment and validate those carried out by manufacturers. The facilities also play an industrial role by making their installations available for research and development tests. The

DTCA is the government's expert on industrial and financial matters, and prepares decisions concerning the DGA's control over the aeronautics industry.

The DTCA provides major maintenance for a large part of the aircraft of the armed forces through its industrial aeronautics plant at Bordeaux, specializing in engine repair, and the industrial aeronautics plant at Clermont-Ferrand, specializing in the repair of airframes and equipment. It employs 8900 people. The aircraft industry, which does all the manufacturing, employs some 108,000 people; its consolidated turnover, exclusive of tax, was 15,500 million francs in 1975 and 19,900 million francs in 1976, 52 percent of which was for exports. The following list includes some of the equipment developed under the control of, or with the aid of, the DTCA and delivered to users during the past 10 years:

1. Military aircraft
 - a. Mirage III family, Mirage 5, Mirage 50: all-weather interceptors and strike aircraft.
 - b. Jaguar: twin-engine trainer, fighter and tactical support aircraft (in cooperation with Great Britain).
 - c. Mirage F1: interceptor and attack aircraft.
 - d. Transall C 160: cargo and personnel transport aircraft (in cooperation with West Germany).
 - e. Atlantic: sea surveillance and antisubmarine aircraft.
2. Helicopters
 - a. Alouette II and III family, Lama: light, multipurpose helicopters.
 - b. SA 321 Super Frelon: heavy, multipurpose helicopter.
 - c. SA 330 Puma: tactical helicopter (in cooperation with Great Britain).
 - d. SA 341 Gazelle: light, utility helicopter (in cooperation with Great Britain).
 - e. SA 360 Dauphin: light, new-generation helicopter.
3. Civil aircraft
 - a. Caravelle: twin-jet medium-range airliner.
 - b. Nord 262 Fregate: "3rd level" twin-turbofan.

c. Concorde: long-range supersonic aircraft (in cooperation with Great Britain).

d. Airbus: medium-range, high-capacity aircraft (in cooperation with West Germany, Holland, and Spain).

e. Mercure: short-range aircraft.

f. Mystere-Falcon 20: medium executive twin jet.

g. Falcon 10: light executive twin jet.

Most of the aircraft mentioned above are still being ordered, and developmental work is being carried out for new versions.

The following aircraft are under development and are to go into service in the next 10 years:

1. Military aircraft

a. Alphajet: light training and support twin-jet aircraft (in cooperation with West Germany).

b. Super Etendard: carrier-based combat aircraft.

c. Mirage 2000: future high-performance combat aircraft.

2. Helicopters

a. WG 13 Lynx: medium helicopter (in cooperation with Great Britain).

b. AS 350 Ecureuil: light, low-cost helicopter.

3. Engines

a. Ariel and Makila: turboshaft engines for helicopters.

b. CFM 56: civil jet engine (in cooperation with General Electric, US).

c. M 53: military jet engine for the Mirage 2000.

A particular characteristic of the DTCA is that it exercises its activity over the entire aeronautical field since, on the national level alone, it works for:

- The army, the air force, the naval air force, the Light Aviation Services of the army, and the Gendarmerie.
- Other public users of aircraft, such as the Service National de Securite (national safety department), and the Geographical Institute.

- Direction Generale de l'Aviation Civile, for which it provides technical and industrial management of programmes.

The DTCA is the main client of the aircraft industry; however, its role is also to participate in the control exercised by the government, constantly endeavoring to prepare for the future, to support the work schedules, and to adapt existing potential.

Direction Technique des Constructions Navales (DTCN)

The function of the DTCN (the French navy) is to design, manufacture, arm, test and maintain vessels of the naval fleet, as well as their ammunition, arms, and equipment. With its human resources and facilities, it represents one of France's foremost industrial enterprises.

The DTCN, heir to the traditions of marine engineering (Genie Maritime), belongs to the public sector. Its missions are defined by the government. For this reason, it falls under the DGA as concerns design studies and construction, and the Chief of Naval Operations as concerns the maintenance and modernization of units of the French naval fleet in service. Government activities of DTCN include:

1. The creation and maintenance of the naval component of France's strategic forces.
2. The implementation of the renewal and maintenance plan for France's conventional naval resources.
3. Participation in the activities for the export of military naval materiel decided upon by the government.

The priority mission assigned to the French navy is to contribute effectively to the deterrent strategy. The DTCN provides general coordination and implementation for naval components. It designs, studies, builds, and develops strategic nuclear submarines, ensures that they are constantly in operational condition, and carries out periodic modernization to keep pace with developments in sensors and weapons.

As a consequence of its deterrent mission, and to ensure the protection and operation of its strategic resources, the navy requires specialized conventional vessels, mine sweepers, light escorts, and antisubmarine and anti-aircraft corvettes. These vessels, which also take part in traditional territorial defense missions in their coastal waters and in the defense of French interests overseas, are also designed and built by the DTCN. It defines the specifications of these vessels, carries out the design studies for sensors and weapons in cooperation with national industries, integrates all systems, builds and arms the vessels, and presents them for testing.

Finally, the DTCN participates in the export of military naval materiel to friendly countries decided upon by the government. It develops and builds vessels specially designed for friendly nations. It builds vessels based on French navy drawings in its own shipyards or assists foreign shipyards with construction. It lends its technical assistance to friendly governments who build in French shipyards, or who arm their vessels with sensors and weapons developed for the French navy.

In addition to its mission as a government organization, the DTCN carries out: (1) various civil works on a paid basis for private companies or for foreign official organizations, (2) specialized naval construction and repairs, (3) high-precision mechanical manufacturing, and (4) metalworking.

The DTCN has an annual turnover of 5000 million francs and directly employs about 35,000 people distributed as follows:

1. In arsenals at Cherbourg, Brest, Lorient, and Toulon. These installations perform mainly the functions of construction, armament, and maintenance of vessels of the fleet. But the arsenals also have research activities, because it has been found logical to install some laboratories in military ports (for example, the submarine acoustical laboratory in Toulon).

2. In establishments outside military ports, engaged primarily in research and development activities, and in manufacturing activities within the corresponding fields (nuclear boiler plants and propulsion equipment at Indret; torpedoes at Saint-Tropez; naval artillery [100-mm anti-aircraft gun], electronics, missiles, and weapon systems at Ruelle).

3. In a complex of study departments in Paris at the Service Technique des Constructions et Armes Navales (STCAN). The main functions are:

- a. Preparing standards and general specifications concerning naval forces, directing all studies upstream, and overseeing development studies conducted in various establishments falling under the DTCN, as well as in private industry on the basis of design contracts.

- b. Acting as prime contractor for naval construction (and naval armament) projects.

- c. Following, from the technical standpoint, the materiel in service.

4. In two overseas bases at Dakar and Papeete.

The following is some of the material designed and built under the control of the DTCN in recent years: aircraft and helicopter carriers, cruisers, missile-launching or antisubmarine frigates, antisubmarine corvettes, different types of rapid or coastal fleet escort vessels, mine sweepers and many dispatch boats, fleet logistical support vessels (BSL), landing vessels (BDC), fleet supply tankers, landing barge transports (TDC), light transport vessels (Batral), lighters, and multipurpose workshop vessels. The DTCN builds merchant vessels, passenger boats, cargoes, trawlers, and coal ships. Recently it has built train ferries for the British Railways Board and French Railways (SNCF).

The DTCN has built many conventional submarines: those of the "Narval" type were significantly revamped between 1966 and 1970. As for those of the "Arethuse," "Daphne," "Gymnote," or

"Agosta" types, two are in service and two are being completed. In 1976, the DTCN began construction of the first SNA (nuclear propulsion attack submarine) at the Cherbourg shipyards.

In the past decade, the DTCN has devoted a large part of its know-how to the design and construction of the Strategic Oceanic Force (Force Oceanique Strategique) by building four nuclear-powered missile-launching submarines and participating extensively in the setup of the supporting infrastructure. A fifth unit is under construction at the DCAN of Cherbourg. For the Cherbourg naval shipyards alone, which were responsible for a major part of the construction, 14 million work hours were needed to carry out the design studies, construction, and corresponding experimentation for the first of these submarines, *Le Redoutable*. Few human undertakings approach such a degree of complexity and precision, calling upon the most advanced technologies in the most varied fields of science and engineering: e.g., nuclear physics, electronics and data processing, optics, chemistry, mechanical engineering and thermodynamics, pyrotechnics and ballistics, physiology, and dietetic psychology.

On order from foreign countries, submarines of various types are also built in private naval shipyards or in DTCN shipyards. With the technical assistance of the DTCN, certain foreign governments have built submarines of the "Daphne" or "Agosta" type in their own shipyards.

DTCN design, construction and development of weapon systems are the following:

1. The weapons themselves.
 - a. Various types of electrical or thermal, homing or guided (with or without wire) torpedoes, of which several hundred have been built.
 - b. 100-mm antiaircraft artillery material--also used by the naval forces of West Germany, Portugal, Belgium, and South Africa.

- c. "Malafon" mixed-trajectory, air or underwater missiles for attacking immersed submarines.

- d. Installation of firing systems for Exocet missiles.

- e. "Masurca" tactical missiles for antiaircraft defense.

- f. Various types of ammunition and military fireworks.

2. The weapons' environment.

- a. Air (radar) or submarine (sonar) detection systems.

- b. Computers generating firing data.

- c. Training simulators.

- d. Data processing systems for the acquisition and storage of tactical data allowing the command to make well-informed decisions (SENIT).

The DTCN also ensures periodic modernization of materiel in service.

The DTCN helps the French Atomic Energy Commission (CEA) and Electricity Board (EDF) in manufacturing equipment used in the nuclear industry. DTCN also manufactures equipment for French and foreign clients--e.g., radomes for aircraft (about 800), primary structures for the N 500 hovercraft to be used by French Railways, and vehicles for the French corps of engineers.

During the past 20 years, the DTCN has expended considerable effort in modernizing naval shipyards and adapting their facilities to technical and strategic requirements.

Much of DTCN's work is now devoted to the Strategic Oceanic Force and its maintenance:

1. Construction of a fifth missile-launching nuclear submarine, *Le Tonnant*.

2. Participation in development studies for new strategic missile weapon systems requiring increasing performance (launching systems and associated data processing facilities).

3. Study and evaluation of missile-launching systems.

4. Participation in the construction and setup of power plants.

5. Maintenance, in ports, of the corresponding industrial infrastructure.

6. Dry docking and current maintenance of missile-launching nuclear submarines between patrols.

Direction Technique des Engins (DTEn)

The DTEn was created in 1965 and is the youngest of the technical directorates of the DGA. The objectives of the DTEn were defined by an organization enactment in 1966. It has responsibility for design studies, development, manufacture, and operational commissioning of ballistic missiles. This enactment was supplemented in 1972 by a new decree extending the responsibilities of the DTEn to tactical missiles. That same decree assigned to the DTEn the Service Technique des Poudres et Explosifs (STPE), created in 1971 and charged with state missions previously falling upon the former Direction des Poudres.

The DTEn has technical departments for ballistic missiles, tactical missiles, and powders and explosives. In addition, it has four establishments:

1. LRBA: Laboratoire de Recherches Balistiques et Aerodynamiques at Vernon (Eure).

2. CAFPE: Centre d'Achevement et d'Essais des Propulseurs et Engins at Saint Medard-en-Jalles (Gironde).

3. CEL: Centre d'Essais des Landes at Biscarrosse (Landes).

4. CEM: Centre d'Essais de la Mediterranee at Toulon (Var).

The latter two establishments were attached to the DTEn by a ministerial order of 1 June 1977.

The Service Technique des Engins Balistiques (STEn) is in charge of manufacturing strategic missiles and tactical ballistic missiles with nuclear warheads:

1. SSBS System (intermediate-range, surface-to-surface ballistic missile) set up in silos located in the Haute-Provence region of France and constituting the Strategic Missile Group of the French air force.

2. MSBS Missile (surface-to-surface, submarine-launched, intermediate-range ballistic missile) used on missile-launching nuclear submarines (SNLE).

3. Pluton System, designed to form the tactical armament of the French army; DTAT is the subcontractor for the development of the firing vehicle and telecommunications.

The Pluton System is being commissioned. The first generation of strategic ballistic systems was successful; the two SSBS units have been operational since 1972, and the SNLE equipped with their 16 missiles carry out deterrent patrols.

The role of the STEn continues today along two lines: (1) ensuring, from the technical standpoint, that systems in service are kept operational, and (2) providing systems for the future. New systems will be needed because of the inevitable obsolescence of present systems, and because it is advantageous to use new technologies to maintain system effectiveness.

The Service Technique des Engins Tactiques (STET) is responsible for managing missile programs intended for combat forces. In view of the increasing role of missile-based weapons systems, the mission of the STET takes on a particular importance within the DGA. The following are some of the main systems developed under the control of the STET:

1. Crotale, which is used by the air force for anti-aircraft defense of its bases, and is to be used by the navy for the defense of its vessels.

2. Mer-Mer 38 Exocet (ship- or submarine-launched antiship missile) to be used on navy vessels.

3. "Magic" air-to-air missile for close-in defense.

4. Super 530 interception air-to-air missile.

The STPE, attached to the DTEn since 1972, has undergone profound organizational transformations in recent

years. Following the law of 3 July 1970--which dealt with the monopoly on the production, importing, exporting, and trading of powder and explosives in accordance with the provisions of the Treaty of Rome--the industrial and commercial activities of the Direction des Poudres were transferred on 1 October 1971 to the Societe Nationale des Poudres et Explosifs (SNPE). The following public missions are carried out by the STPE:

1. Mediation between SNPE and the technical directorates of the DGA for defining programs and placing orders for powder and explosives (covering two product areas: those intended for explosive charges of weapons and for propulsion).

2. Responsibility for a transition period relative to the problems raised by the transfer of activities from the old Direction des Poudres to the SNPE.

3. Management of general studies and investments of the state so as to place at the disposal of the responsible departments the weapon systems and powders meeting their requirements.

The four establishments of the DTEn act as experts and controllers in the technical fields concerning missiles. In particular, the LRBA specializes in transsonic and supersonic aerodynamic questions in the inertial field, in which it has interdepartmental functions with respect to satellites. The CAEPE carries out ground engine tests and final erection of ballistic missile systems. It also plays an important part in the supervision of the activities of industrial manufacturers in the Aquitaine region who have contracts with the DTEn. The Test Centers of the Landes and Mediterranean regions carry out flight tests on strategic and tactical missiles.

Service de la Surveillance de l'Armement (SIAR)

The SIAR, an outside body dependent on the DPAI, is responsible for assuring that armaments manufactured by industry

conform to technical specifications. This department, whose territorial locations are plotted on those of defense zones, comprises a central department in Paris and six Regional Directorates based in Paris, Lille, Nantes, Toulouse, Marseille, and Nancy.

The Central Service element is responsible for the management and administration of the six regional areas. In some respects it performs missions similar to those assigned to the Defense Contract Administration Regions (DCASRs).

Within the scope of its mission, the SIAR performs various tasks concerning industrial contracts and orders coming under the DGA and requiring technical in-plant inspection. These tasks include:

1. Technical supervision of work and production;

2. Acceptance of equipment and supplies, before delivery to the armies, when the SIAR has been made explicitly responsible for this;

3. The necessary observations upon clearance of accounts;

4. Clearance of accounts and commissioning, when the SIAR has been explicitly put in charge.

The SIAR also performs its activity for the benefit of other departments of the Ministry of Defense and other French or foreign administrations and public organizations.

The SIAR work force consists of approximately 2240 personnel. They provide service to roughly 7000 plants on a full- or part-time basis. The skill mix is as follows: professional engineers, 8 percent; technical specialists, 40 percent; and blue collar (inspectors), 52 percent. Moreover, the SIAR pursues longer-term action by promoting "quality control" with industries working for the armament sector.

3 DEFENSE MATERIEL PROCUREMENT

Government purchasing in France is regulated by the Code des Marches Public (Code of Government Contracts). The code is divided into four books:

1. Book I--General provisions.
2. Book II--State contracts (government contracts).
3. Book III--Contracts of local authorities and their public utilities.
4. Book IV--Coordination of government procurement at local level.

In addition to the above, all departments of the central government must adhere to certain general administrative clauses. These clauses are published in the Cahiers des Clauses Administratives Generales (CCAG).

France uses the term "industrial contracts" to identify products that are not in a standard catalogue, but are special-order products. The term "current supplies" relates to products that are in a standard catalogue, or are nonspecialized.

Basically, the French use three procedures in their procurement process:

1. Automatic tender (adjudication)
 - a. "Public"--when all suppliers may submit a bid.
 - b. "Selective"--when only a limited number of suppliers are invited or allowed to submit a bid.
2. Discretionary (appel d'offres)
 - a. "Public"--when all suppliers may submit a bid.
 - b. "Selective"--when limited to firms already known as suppliers or distributors, or to firms which have applied for inclusion on the list kept by the various governmental departments (similar to a DoD Qualified Bidders List).
3. Private contract--a negotiated contract. This method is used only in limited cases. The criteria for use are set forth in Article 104, Code of Government Contracts. Basically, these exceptions are similar to those contained in Section 3, Part 2, Circumstances Permitting Negotiations, US Armed Services Procurement Regulations/Defense Acquisition Regulations.

French regulations concerning the awarding of government contracts encourage the use of maximum competition. Generally, the automatic tender and

discretionary procedures are considered the competitive methods. Within these methods there is a minor variation which permits an award to a competitive firm when specific research is required for technical, aesthetic, or financial reasons. These awards are called "conours."

Except for private contracts, selective suppliers, and "conours," all purchases must be announced through posters, the "Bulletin Officiel des Annonces des Marches Public" (comparable to the Commerce Business Daily), or advertisements in trade journals.

Under the automatic procedure (where the contract goes to the lowest bidder) bids are usually submitted in sealed envelopes. They are opened and read aloud in public; the provisional award of the contract to the successful tenderer is then announced in public. (This feature is very similar to DoD's for competition.)

Under the discretionary procedure, the bids are not opened in public. The minutes of the proceedings may not be communicated to bidders. When a contract is awarded, the authorities inform the successful bidder and notify all other bidders that their offers have not been accepted. If no contract is awarded, all bidders are informed that their bids have not been accepted. (Again this is comparable to the method used by DoD for negotiated procurement.)

In principle, foreign firms have the same opportunities as domestic firms when bids are invited. Foreign firms are eligible for inclusion on the lists kept by government departments. They are not subject to any special regulation since the French regulations on buying apply to French and foreign firms alike.

There is no procedure for reviewing foreign tenders centrally before a contract is awarded, and there are no special exchange restrictions applicable to government buying. Import duties are calculated in the normal way when foreign tenders are evaluated.

However, restrictions apply in certain cases:

1. For purchases of current supplies, procurement departments may stipulate that French suppliers only will be eligible to bid, but this provision will not be retained in the next CCAG. In the case of industrial contracts, the manufacturer must be of French nationality and must supply proof of his ability to fulfill the orders on French territory. However, the general administrative clauses of the specifications stipulate that these provisions shall not run counter to international agreements. Although the Convention instituting the OECD and the General Agreement of Tariffs and Trade do not, unlike the Treaty of Rome, contain specific provisions relating to government purchasing, no distinction is made in practice between nationals of the various signatory countries. This resort to discrimination is in fact seldom used.

2. For public works and building contracts the general administrative clauses of the specifications provide that the equipment and materials used may be of French origin, subject to international commitments. But this wording is interpreted in the same liberal manner as above, and in practice this provision is no longer enforced.

3. For reasons connected with national defense, contracts for armaments impose specific conditions in regard to nationality, acquisition of a manufacturing license or sales authorization, government supervision, and sometimes the keeping of costs accounts (Article 25 of the General Administrative Clauses for Industrial Contracts). In some cases, however, NATO agreements make it possible to disregard these restrictive clauses.

Regulations of a social character provide for preferences to be granted to French suppliers. When there is equality of tenders, Articles 62 and 63 of the Code of Government Contracts give preference to the producers' cooperatives and agricultural producers'

societies. Where the service is divisible into shares, one-quarter of these may be assigned to the aforementioned societies at the mean price fixed for the other shares (Article 63). The same applies, though with slightly different terms, to workers' cooperatives and artists' cooperatives (Articles 69 to 71 of the code). In practice, these preferences are seldom applied.

These special cases apart, purchasing departments have been reminded again recently that they should invite competition on the widest possible basis at both the national and international level. But it has been pointed out that in order to avoid indiscriminate competition given equal quality and prices, the contract should be awarded to the domestic supplier if quality and prices are equal.

The first possibility of appeal by a dissatisfied candidate or supplier is a complaint directly to the person responsible for making the purchase. If this complaint is unsuccessful, the petitioner can submit the case to the immediate superior of the person responsible (for example, the head of division or head of the purchasing service). If this appeal produces no result or is turned down, the petitioner can put his case to the government department responsible for the purchasing service.

The petitioner also can refer the matter to the Commission Centrale des Marches. This is an interdepartmental body whose general secretariat comes under the Code of Government Contracts. The Commission Centrale des Marches orders inquiries into government services that are under its purview. These investigations are primarily intended to ensure that the regulations concerning government contracts are observed.

If the dispute cannot be settled through departmental channels, the petitioner has the right to take it to the administrative tribunals and ultimately to the Conseil d'Etat. The ordinary courts are not competent in government contract cases.

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