



MINISTRY OF  
**DEFENSE**



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Strategic Projects

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Strategic Projects

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# INTRODUCTION

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The National Defense Strategy (END) has as one of its structuring axes the strengthening of the Industrial Defense Base (BID), which assures the fulfillment of the needs of technologically advanced defense products and highly qualified professionals. These technologies reduce external dependence and maintain the operational requirements of the Brazilian Armed Forces.

The role of the Ministry of Defense (MD), through the Secretariat of Defense Products, is to align the relationship between companies and the Armed Forces, for the development of these technologies, the industrialization of new products and their dual use (civil and military) in Brazilian society.

In this way, the BID, formed by an integrated set of public and private companies, encourages national economic development and contributes to the country's foreign trade. It is responsible for more than 60 thousand direct jobs, accounts for 3.7% of the Gross Domestic Product (GDP) and moves around R\$ 200 billion in the national economy.

The MD rely on representative entities of the BID, which are directly related to the companies, such as the Brazilian Association of Defense and Security Material Industries (ABIMDE), the Brazilian Association of Machinery and Equipment Industry (ABIMAQ) and the Federations of Industries of Federated States, through their respective Committees of Defense (COMDEFESA).

The partnerships established leverage the strategic projects of the Armed Forces, in three sectors highlighted for National Defense - nuclear, cybernetic and aerospace. The mastery of new technologies and the increase of productivity and diversity in the Brazilian industry ensure the operational capacity of the Forces. The Defense segment requires policy, economy and State strategy. Avoiding conflicts and preserving sovereignty requires a permanent preparation effort to ensure the readiness of the Armed Forces' usage. Only continued investments over time

and resources in the modernization of the Forces projects may ensure the deterrent power of the country.



Strategic Projects

# MINISTRY OF DEFENSE



# H-XBR

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The HX-BR Project was created to equip the Brazilian aerospace industry with the technology necessary for the development and production of helicopters. The hiring took place to jointly attend the Armed Forces and the Presidency of the Republic, in a pioneering initiative. The contract also guarantees the transfer and absorption of technology.

Of the total of 50 H-225M aircraft stipulated in the contract, 16 are destined to the Navy, 16 to the Army and 18 to the Brazilian Air Force. Two of these helicopters will attend the Presidency of the Republic.

In addition to the implementation of the production line and all the support and maintenance capacity for this type of aircraft, the creation of a helicopter engineering center at Helibras company was completed. The initiative encourages the production of components by the national industry and enables the realization of aircraft modification projects in the national territory.

The H-225M conducts tactical transport of troops and cargo missions, in-flight refueling, combat search and rescue, enlightenment, and maritime surface protection. The helicopter is considered essential for the support in situation of public calamity, rescue and logistic transport.

Operating both on ships and on land, these aircraft have all-weather capacity - including flights in icy conditions - supported by compatibility with next-generation night vision goggles. The range of more than 280 miles can be extended with air-to-air fueling.

The first helicopter was delivered in 2014, assembled and tested in Brazil with a mission system developed with the participation of the national industry, which includes the integration of electronic warfare sensors, armament and maritime radar.

In 2015, the Air Force received its first aircraft in the FAB operational version, with self-protection capacity, in-flight refueling, among other equipment that increase the Force's operational capability, as well as diversified missions.

The two aircraft in the Basic Plus version, delivered to the Brazilian Navy in 2017, made it possible to carry out search and rescue missions by the Naval Force.

To date, 34 aircraft have been delivered: 10 for the Navy, 11 for the Army and 13 for the FAB, including the two aiming to assist the Presidency of the Republic.

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# PESE PROJECT

## STRATEGIC PROGRAM OF SPACE SYSTEMS

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Assure to Brazil the autonomy of production, launching, operation and replacement of aerospace systems from the development of dual use products, i.e., both for military and civil employment, and boosting the technological and industrial capacity of the country. This is the objective of the Strategic Program of Space Systems (PESE), a program of the Ministry of Defense that establishes a strategy for the deployment of space systems, from satellite communications development projects, remote sensing, geolocation and launch vehicles, among others.

According to the National Defense Strategy (END), the Brazilian Air Force (FAB) is responsible for promoting a series of measures aimed at guaranteeing the execution of these projects and the consequent autonomy of national production.

Due to its territorial dimensions and volume of natural resources, Brazil demands a series of communications, meteorology, imagery and strategic data services that are obtained from the use of satellites, which need to be dominated by the Brazilian State. In addition, space monitoring is an integral part and indispensable condition for fulfilling the strategic tasks that will guide the FAB, such as: multiple and cumulative surveillance and local aerial superiority.

Including the Country in a global scenario, where few have the management, operational, technological and industrial capacity to make use of space, requires coordinated efforts among different segments of

society. The PESE also presents itself with the perspective of unifying efforts to optimize material and human capacities for the benefit of all Brazilian society.

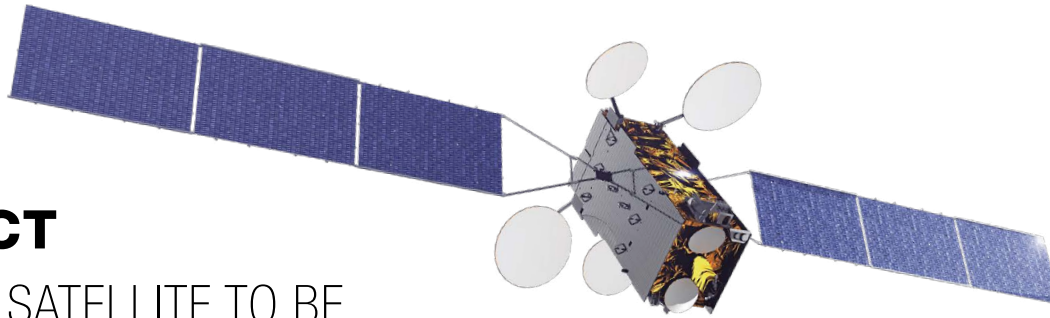


## SGDC-1 PROJECT

THE FIRST SATELLITE TO BE 100% CONTROLLED BY THE GOVERNMENT WILL GIVE THE COUNTRY FULL CONTROL OF THE INFORMATION THAT ORBIT THE NATIONAL TERRITORY AND INTERNET THROUGHOUT BRAZIL.

Designed to provide a secure and sovereign means for Brazilian government communications, the First Geostationary Satellite of Defense and Strategic Communications (SGDC-1) is a partnership of the Ministry of Defense with the Ministry of Science, Technology, Innovation and Communications. The project involved investments of approximately R\$ 2.7 billion also covering, in addition to the satellite itself, the entire associated ground segment, as well as access to critical space technologies through absorption and technology transfer programs.

The satellite has a Ka band payload, controlled by Telebras and



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destined for strategic government communications and the National Broadband Program (PNBL), and another X band, exclusively used by the Ministry of Defense to meet the needs of the Military System of Command and Control (SISMC<sup>2</sup>).

In the Ka band, the SGDC-1 is the only Brazilian satellite capable of providing Internet access in 100% of the territory and national jurisdictional waters, in order to promote the digital inclusion of Brazilian citizens. In the X band, the satellite contributes for increasing the effectiveness of joint military operations and interagency operations, including border regions, peace missions, Law and Order Assurance activities, offshore rescue operations and airspace security, covering the Brazilian territory and its strategic environment.

The absorption and transfer of technology carried out under the SGDC-1 Project met, among others, the goals of the Strategic Program of Space Systems (PESE). This program provides for the construction of other satellites with the participation of the national industry. The professionals involved, engineers and technicians, learned to control the satellite and its payloads, which has been done from the Space Operations Center (COPE) in Brasília and the secondary COPE in Rio de Janeiro, both from Aeronautics.



Strategic Projects

# BRAZILIAN NAVY

# PROSUB - SUBMARINE DEVELOPMENT PROGRAM

In order to contribute to the defense and sovereignty over Brazilian Jurisdictional Waters, the Brazilian Navy has concentrated its efforts on the Submarine Development Program (PROSUB), which will expand the military's operational capacity to protect and preserve our Blue Amazon.

Inserted in the Federal Government's Avançar Program and coordinated by the Navy Command, PROSUB, created in 2008, the project provides for the construction of industrial infrastructure to support the operation and maintenance of submarines, the construction of four conventional submarines and the design and construction of the first Brazilian submarine with nuclear propulsion.

Supported by three pillars: technology transfer, except in the nuclear area, nationalization of equipment and systems and personnel training, the Program is enabling the first industrial and logistic support complex dedicated to naval means with nuclear propulsion in the southern hemisphere.

Built in an area of 750 thousand square meters, the Itaguaí Naval Complex houses the Industrial and Support Infrastructure, composed of a Manufacturing Unit of Metal Structure (UFEM), two shipyards, one for construction and the other for maintenance and a naval base (EBN), a Specialized Maintenance Complex, two dry docks, workshops, administrative areas, 13 piers and a shiplift - with capacity to support 8,000 tons, in addition to an Instruction and Training Center for submarines

The first of the four Brazilian Conventional Submarines (S-BR), the Ria-

chuelo Submarine (S-40), was launched at sea on December 14th, 2018. Then come the Humaitá (S-41), in 2020, the Tonelero (S-42), in 2021 and the Angostura (S-43), in 2022. Finally, the Navy will launch the first Submarine with Brazilian Nuclear Propulsion (SN-BR), to be named "Álvaro Alberto", in honor of the Admiral who was the pioneer in the use of nuclear technology in the Country.

PROSUB will guarantee Brazil the ability to design, build, operate and maintain its own conventional and nuclear propulsion submarines. As a reference to the transfer of technological training, the conclusion of the basic project of the submarine with nuclear propulsion (SN-BR), developed by a team of highly qualified engineers, named SN-BR Project Technical Body, composed of military and civilians of the Brazilian Navy, in January of this year may be mentioned.

The implementation of the Program will also strengthen several sectors of the national industry of strategic importance for the country's economic development. Prioritizing the acquisition of components manufactured in Brazil, PROSUB promotes the development of the Defense Industrial Base, which encompasses the electronics, mechanical (thin and heavy), electromechanical, chemical and Brazilian Shipbuilding Industry.

Further information: [www.prosub.mar.mil.br](http://www.prosub.mar.mil.br)

NAVY

*Steel Structure Manufacturing Unit (UFEM), Itaguaí - RJ*



# PNM - NAVY

## NUCLEAR PROGRAM

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Started in 1979, the Marine Nuclear Program (PMN) covers two major projects: the nuclear fuel cycle mastery and the construction of the Nucleoelectric Generation Laboratory (LABGENE).

The Navy achieved the mastery of the difficult uranium enrichment process by ultracentrifugation, high value-added technology in 1988.

From this technology, the Navy has collaborated with the Nuclear Industries of Brazil (INB) and, since 2000, has provided ultracentrifuges for its industrial plant in Resende (RJ), where nuclear fuel is produced for the Angra Plants, a good example of dual use of this technology.

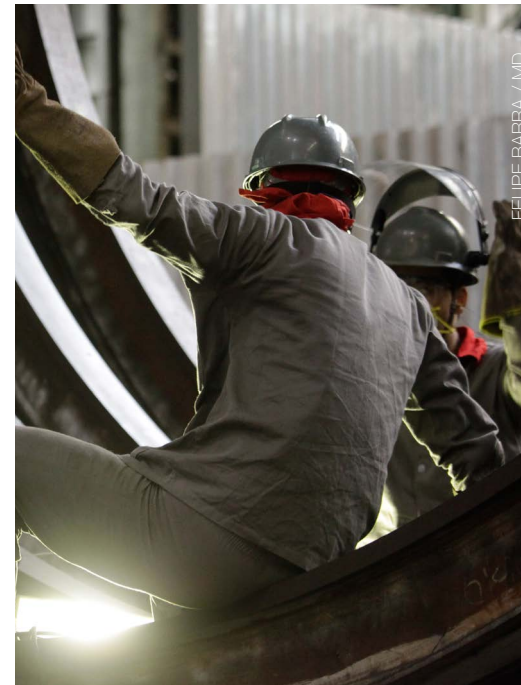
Another benefit of this program for the society was the launching of the cornerstone of the Brazilian Multipurpose Reactor (RMB) in June 2018, which will make Brazil self-sufficient in the production of radioisotopes - an essential input for the manufacture of radiopharmaceuticals of great importance for the treatment of diseases in several areas of medicine, such as cardiology, oncology, hematology and neurology. In addition, the RMB will have numerous applications, such as nuclear research.

On the same date, the integration tests of LABGENE's turbogenerators - the first fully-designed nuclear power plant in the country, which will be on the land, the prototype of the Brazilian nuclear submarine's propulsion plant. Few countries in the world have

been able to achieve these technologies to date.

Other positive aspects of the investment in nuclear energy are the nationalization of industrial processes and equipment, the innovations resulting from program partnerships with universities and research institutes and the generation of direct and indirect jobs. There are also the direct repercussions of the program in the conquest of the country's independence in sensitive technologies and in the development of the national defense industry.

NAVY



*Construction of the first PROSUB (S-BR1) conventional submarine at UFEM, in Rio de Janeiro*

# CLASS “**TAMANDARÉ**”

## SHIP CONSTRUCTION PROJECT

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The Navy of Brazil, continuing the Strategic Program “Construction of the Core of Naval Power”, develops the Construction Project for the “Tamandaré” Class Corvettes (CCT). This project expects the acquisition of four new escorts of high military and technological capability, observing the state of the art of platform construction and the use of sensors and weapon systems.

The acquisition of the four military ships is of utmost importance to the Navy and other sectors of society, especially to the Industrial Defense Base (BID) and to the Brazilian shipbuilding industry. The initiative will modernize the Naval Force for the construction in the Country of ships with an important index of nationalization of components and equipment.

They will be versatile ships with high combat power capable of opposing multiple threats and designed to the protection of maritime traffic and control of maritime areas under Brazilian jurisdiction, being able to carry out defense missions, near or far in the Blue Amazon, as well as carry out the international commitments assumed by Brazil.

The Navy understands that the country has a large and diversified industrial park, however, not homogenous. In this sense, the CCT Procurement Project is an excellent opportunity that MB provides, in order to contribute to the greater capacity and competitiveness of the national industry. During the analysis of the proposals received, it was possible to verify a significant

NAVY

potential of success for the national market, considering the existence of 245 Memos of Understandings, involving 150 companies distributed in 10 units of the Federation.

The analysis of the best offer occurred in March 2019 and the forecast for the entire project will be completed in up to eight years after the contractual signatures. The project also includes life cycle management, including after-sales maintenance, with the usage of companies installed in Brazil.



*Tamandaré Corvette*

Strategic Projects

# BRAZILIAN ARMY



# SISFRON

## INTEGRATED BORDER MONITORING SYSTEM

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A country of continental dimensions, Brazil has almost 17 thousand kilometers of border with 10 South American countries. Aware about the need for strengthening the presence of the State in the region, the Brazilian Army created the Integrated Border Monitoring System (SISFRON), with the dual purpose of supporting the defense of the integrity of the national territory against external threats and of acting against transboundary illicit, such as drug trafficking, smuggling and environmental crimes.

Largest land border surveillance project in the planet, SISFRON was designed to assist not only the Army's unique operations but also joint operations with the other Armed Forces and other government agencies in so-called interagency operations.

The system relies on state-of-the-art technologies. With the aid of satellites, radars and other sensors, territorial scans will be made by sending coded data to agents who, in real time, can identify illegal situations, at any time of the day or night.

In addition to ensuring greater security, the System promotes advances for the Brazilian industry and generates jobs in the Country. Most of the equipment and technologies used (70%) have national origin. For the first phase of the System's implementation, some 390 direct jobs and more than 1,500 indirect jobs have already been generated.

Currently, the pilot project of SISFRON is located in about 600 kilometers of the border strip, monitored by the 4th Mechanized Cavalry Brigade, in the southwest of Mato Grosso do Sul, from the municipality of Dourados. The next step is its expansion in the states of Paraná, Mato Grosso and the Northern region of the country.

In May 2018, the Army promoted the Operational Technical Validation Exercise. About 500 soldiers and 145 vehicles were employed during the maneuver. In addition, tests of synchronization of the tactical communications system, optronic tests, daytime and night operations, and the use of radars in zone recognition were performed.

ARMY

# GUARANI

## STRATEGIC PROGRAMS OF THE BRAZILIAN ARMY

“If the beloved homeland is engaged by the enemy, in peace or in war, it defends the earth against danger.”

Fibra de Herói  
(Hero Courage)

Beginning in 2013, the Guarani Program was designed to equip the Brazilian Army with a modern armored family on wheels that meet the doctrinal and compliance requirements of the missions of foreign defense and protection of Brazilian society.

In addition to armored protection, Guarani brings aggregated values, such as weapons, command and control and communications systems through technology transfer and technical qualification of national labor, also contributing to the generation of employment and income.

The Program has already provided the creation of 2,890 direct and indirect jobs and involved the participation of 125 suppliers of inputs, 90% of which are of national origin.

ARMY

*About 90% of the  
components used  
to manufacture  
Guarani are  
made in Brazil*



The vehicles are integrated by modern weapons systems, with selective lethality capacity, and a flexible command and control system, in order to allow them to operate in a broad spectrum of conflicts.

The new family of mechanized vehicles includes a medium subfamily, with versions for reconnaissance, personnel transportation, mortar, rescue, command post, firing center, workshop and ambulance. It also has a light subfamily, with versions for reconnaissance, anti-vehicle, light mortar, radar, command post and advanced observation. Designed by the Army's Science, Technology and Innovation System, the GUARANI Program was developed in partnership with several national companies.

In March 2018, the 300th vehicle was delivered out of a total of 1,580 units that are expected to be in use in the different military units by 2038.

## CYBER DEFENSE

To ensure that strategic information flows rapidly and safely, in an increasingly connected and digitally vulnerable world, the Cyber Defense Army Strategic Program (PEEDCiber) has been created. This program has placed Brazil in the restricted group of national and international organizations with the capacity of developing protection measures. The measures are aimed at preventing attacks in the cybernetic area by means of a high-level structure involving not only military but also people from academia, research

and development institutions and the business sector.

Another important measure in this sense was the creation of the Cyber Defense Center (CDCiber), with the responsibility of coordinating and integrating the activities of Cyber Defense within the scope of the Ministry of Defense.

In addition to the establishment of Cyber Defense structures, the project has already enabled the national development of important softwares, such as the Cyber Operations Simulator (SIMOC).

SIMOC enables those responsible for National Cyber Defense to improve techniques and tools to prevent, detect and mitigate attacks on data networks, identify vulnerabilities, create protection mechanisms and empower people.

In the area of hardware, there is also the development of Software Defined Radio (RDS) and the acquisition of supercomputers that allow high level research.

In 2014, a decree of the Ministry of Defense established norms to strengthen the Cyber Defense sector in the country. From this new orientation, in 2016, the Cyber Defense Command (ComDCiber) was created, which counts on officers and Men of the three Armed Forces.

ARMY



Strategic Projects

# BRAZILIAN AIR FORCE



# F-X2 PROJECT

## F-39 Gripen E/F

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Brazil understands that Defense is one of the main sectors with the capacity to boost technological knowledge, increase the export of products with greater added value and bring benefits to the Brazilian economy. Therefore, when purchasing military equipment, the country seeks to adopt measures to become increasingly competitive, with cooperation agreements that allow for a broad technological growth.

In this context, Project F-X2 was born, which, based on the need to re-equip the Brazilian Air Force (FAB) with fighter planes, it seeks to incorporate important technological advances in the Brazilian Defense Industrial Base.

Just as in the 1980s, when Brazil signed a historic partnership with Italy in the AMX Project, bringing to the national domain the knowledge to produce aircraft in the jets category, now a cooperation agreement with Sweden elevates the country to a new aerospace level.

Signed in 2014 by the Brazilian Air Force, the contract with the Swedish company Saab foresees the acquisition of 36 Gripen fighter jets, being 28 monoplaces (for one pilot) and eight biplaces (for two crew). The first Brazilian aircraft, equipped with FTI (Flight Test Instrumentation) to conduct development trials, will fly in 2019 and the first series aircraft will be delivered to FAB in 2021.

AIR FORCE

The F-39 Gripen multi-use supersonic aircraft, designed for air-to-air, air-surface (sea and land) missions, will be used by the FAB in air defense, attack and reconnaissance actions, comprising airspace policing and other actions related to usage of Aerospace Power.

Thanks to a strategic philosophy of supporting the national industry, Brazil currently has qualified companies that could therefore be included in the compensations package (offset) negotiated by the Coordinating Commission of the Combat Aircraft Program (COPAC) with Saab, making the Industrial Defense Base also participate in the development of Gripen.

The technology transfer program is composed of about 60 key projects. The most expressive is the Gripen Design and Development Network (GDDN), located in Gavião Peixoto (SP). The unit is the hub for all technological development of Gripen in Brazil for Saab and Embraer among with partner companies and institutions.

More than 350 Brazilian professionals, among engineers, operators, technicians and pilots from Saab and Brazilian Air Force partner companies will participate on-the-job training and courses in Sweden, closely followed-up and monitored by Swedish technicians. These professionals will then be directly employed in the work package of development and production of the Gripen aircraft in Brazil, in their companies of origin. This process is part of the technological transfer, in which skills and knowledge will be acquired by the Brazilian indus-

try, enabling the final assembly of these aircraft in Brazil. The agreement also provides for logistical support and the acquisition of the initial weaponry to be used on Gripen E/F aircraft.



## KC-390 PROJECT

### NATIONAL CARGO

Largest military aircraft ever produced in Brazil, the KC-390 represents a milestone in the excellence of project management of the Brazilian Air Force. This is because it can combine the issuance of requirements and offset packages in order to boost several sectors of the Industrial Defense Base. Altogether, more than 50 Brazilian companies participate in the project, which also counts with the collaboration of Argentina, Portugal and the Czech Republic.

Considered as the new backbone of military transport aviation in Brazil, the aircraft has the capacity to operate in the most diverse scenarios, from the Amazon forest to the landing strips in Antarctica. The KC-390 will carry out a series of logistic transportation and in-flight refueling missions. Due to its capacity to carry up to 23 tons, the aircraft can also accommodate large equipment such as weaponry, semi detached aircraft and even the armored Guarani, an Army equipment that will be used to protect the gigantic Brazilian land border.

In 2014, FAB signed the purchase contract for 28 aircraft. At the beginning of 2015, the maiden flight of KC-390 was performed, starting the test phase of the two prototypes. The 28 units for the FAB will be delivered over eight years. The contract provides for the provision of a logistical support package, which includes spare parts and maintenance.

The national multi-mission cargo plane is already born with great possibilities of export to countries that will also soon have to replace their aircraft of this same size. Hence, Brazil should become part of a market niche until then dominated by large international companies.

This project is the result of a great effort of the last decades, involving the FAB and Embraer that bet on the investment in teaching and research to have, in national territory, highly qualified professionals.



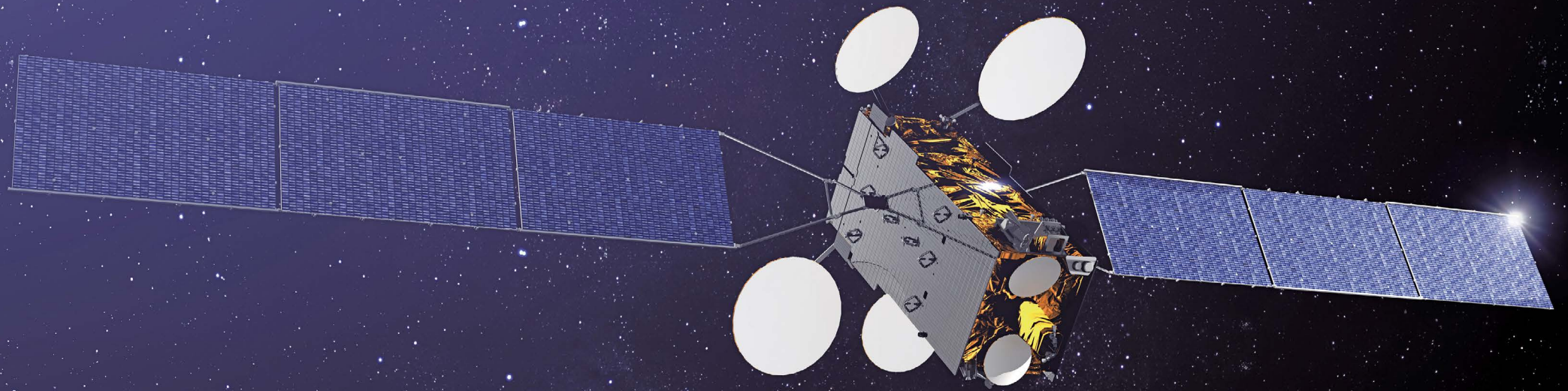
*Construction of the national KC-390 freighter at the Embraer plant, in Gavião Peixoto (SP)*

**MINISTRY OF DEFENSE**

**MINISTER OF DEFENSE**

Fernando Azevedo

Social Media Advisory  
Updated on March 2019



**The Geostationary Defense  
and Communications Satellite (SGDC)**

is wholly controlled by  
Brazil, with a band of exclusive  
military use, preserving  
strategic information from the  
Brazilian government.



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