

NAVY STRATEGIC PLAN PEM 2040

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The Navy Strategic Plan (PEM 2040), published in September 2020, is the most relevant guiding document of the Brazilian Navy. This Plan takes place within and naturally aligns with the Brazilian Magna Carta and its top defense documents: especially the Brazilian National Defense Policy and Strategy (PND/END); the National Defense White Paper; the National Marine Policy, laid down in law, aiming to guide the integrated and harmonious development of national marine activities towards the effective, rational, and full use of sea and inland waterways for our national interests; and the Naval Policy, following the Top Planning System of the Brazilian Navy.

Among these documents, we would like to point out the naval policy published in 2019, which provided elements for the Navy Strategic Map containing Naval Objectives for the Brazilian Navy.

Following the advice from the then Navy Commander, Admiral Ilques Barbosa Junior, this Plan, aimed at the Brazilian society, sought simplicity, objectivity, a clear language, and a modern and attractive layout. It contains a strategic section describing the relevant aspects of naval strategy, such as the marine operational environment, threats to it, and the Naval Strategic concept, whereas its executive portion describes the Navy Strategic Map, and Naval Strategic Actions to achieve the Naval Objectives provided for in the Naval Policy; the latter consolidated in Seven Strategic Programs.

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MARINE OPERATIONAL ENVIRONMENT

By analyzing the Marine Operational Environment, we show that Brazilian sea and waterways are vital for the national prosperity, both due to the economic exploitation of their resources — especially energy production — and due to the global connection for foreign trade.

Thus, we visit the Sea Power concept from a Brazilian perspective to highlight the dual character of the Brazilian Naval Power resulting from the integration of available national resources for using the sea and waterways as an instrument of political-military action and as a factor of socioeconomic development.

This maritime mentality is fundamental since it reflects how aware both society and government decision-makers are of the relevance this expression of power has for Brazil.

We also highlight the “oceanopolitical” concept of Blue Amazon (whose magnitude and potential riches are comparable to the Green Amazon) which we should address under sovereign, economic, environmental, and scientific aspects.

The Plan describes possible threats to the Brazilian sovereignty and its marine interests, since the Blue Amazon belongs to this strategic environment centered in the South Atlantic. Thus, the national defense policy and strategy shows that Brazil belongs South America.

To deepen its cooperative ties, Brazil visualizes a strategic environment going beyond South America and including the South Atlantic, adjacent African countries, and Antarctica. The parallel 16° N to the north; Antarctica to the south; the West African coast to the east; and South America to the west delimit it. Its northern boundary encompasses three important areas: the region between the Brazilian northeastern and African western salient points, the Caribbean Sea, and the Brazilian coast in the Northern Hemisphere.

The South Atlantic lies in the center of this region, belonging to strategic marine areas of the greatest importance for the Brazilian Naval Power. We highlight a large South Atlantic marine area under national jurisdiction: the Blue Amazon.

A politico-strategic concept of national importance corresponding to the Brazilian Jurisdictional Waters, it comprises a maritime space greater than half of the Brazilian land territory. We have sovereign exploitation

rights of the natural resources in this water mass and its continental shelf, a portion of the continent which extends to the sea subsoil.

According to the United Nations Convention on the Law of the Sea, our maritime spaces extend for approximately 3.5 million km². Following the proposed additions to the UN Commission on the Limits of the Continental Shelf, maritime spaces could reach up to 5.7 million km². The area, therefore, surpasses the dimensions of the Green Amazon.

With incalculable natural resources and a biodiversity comparable to that of the Green Amazon, our maritime space is of great strategic importance for Brazil's sovereignty, economy, environment, and science.

IMAGEM

Since oceans are the spaces in which national powers project themselves into international relations, the sovereignty aspect of the Blue Amazon relates, to a large extent, to the attributions of the Brazilian Navy, representing the State authority and mediating the use of force at sea. Thus, current multifaceted threats involve these maritime spaces in national security.

The **economic** aspect comprises the wealth of living and non-living resources, international maritime spaces, and the sea transport, encompassing much of our foreign trade. It directly relates, therefore, to Brazil's national development due to the historical importance of the economic projection to the sea and the insertion of maritime powers in the Concert of Europe.

The **environmental** aspect assumes a more regulatory bias since the continuity of oceanic spaces and the mobility of marine currents expand possible wildlife trafficking and the compromising exploitation of the marine environment. Thus, this aspect shows we need to build agreements, due to the international relevance of this theme.

The **scientific** aspect of the Blue Amazon alludes to the potential research, technological, and economic development of marine biodiversity, and the need to preserve knowledge of an environment which marine forces can employ during conflicts.

Brazil has over 8,500 km of coastlines, and about 60,000 km of navigable rivers, supporting more than 40 ports and organized sea terminals and hundreds of offshore oil platforms.

The Brazilian Jurisdictional Waters, corresponding to the Blue Amazon, are the main foreign trade route in the country, transporting about 95% of its entire trade by sea. Around 1,400 merchant ships sail these waters daily, and the Brazilian Navy, invested as the Maritime Authority, operates the Marine Traffic Control.

In 2020, exports totaled about US\$ 210 billion, whereas imports, US\$ 159 billion. Thus, we find that a possible interruption of maritime communication lines could collapse the Brazilian economy, depriving it of the essential inputs for its prosperity and survival.

The biodiversity of the Blue Amazon is comparable to that of the Green Amazon, but its economic, energetic, mining, research, developmental, and innovative potential has, until now, been less exploited.

One of the most strategic potentials of the Blue Amazon is energy supply, accentuated by the pre-salt oil production begun in this century. Brazil produces about 3 million oil barrels, and 130 million cubic meters of natural gas a day. According to a National Agency of Petroleum, Natural Gas and Biofuels (ANP) bulletin published in November 2020, offshore wells produce 96% of the national oil and 81% of the natural gas. The Campos and Santos basins account for 96% of the national oil production. The Pre-Salt Basin production corresponds to 70% of the national total. Interrupting oil and natural gas production from offshore wells could lead to an energy collapse, due to the national dependence on these resources.

THREATS

We would like to issue a stern warning against the empty and nonsensical notion that Brazil lacks any threats, and is a nation which aims, to a certain extent, to divert and empty the attention its society, politics, and government must pay not only to the national defense budget but also to the political discussion it entails.

We will now show the main threats which could destabilize Brazil and its sea affairs.

- Scarcity of natural resources. Thus, maritime spaces constitute the next global disputed frontier;
- A superior naval South Atlantic power may threaten Brazilian sovereignty;
- Pirate attacks within the Brazilian strategic environment;
- Criminal organizations threaten exports, and sea and river lanes;

- Illegal fishing, which requires a global effort to create a network aimed at facing it;
- Oil leaks on the Brazilian coast, such as the one in the Northeast, show that environmental crimes can have a lasting and quite negative repercussion in many aspects of Brazilian life;
- Cyberspace vulnerability.



The figure above shows the main threats described in the PEM 2040:

We highlight the Defense of Sovereignty at the center; the main concern of the Brazilian Navy in maritime and fluvial spaces.

Piracy has concentrated itself on the African South Atlantic shore, such as in the Gulf of Guinea, which belongs to the Brazilian strategic environment, demanding the Brazilian cooperation towards its maritime security and of its neighboring countries.

We also highlight:

Illegal, unreported, and unregulated fishing;

Illegal access to knowledge: fauna, flora, and biopiracy; Organized crime;

Maritime terrorism;

Environmental issues, natural disasters and pandemics; Cyber threats;

And, finally, natural resource conflicts. Stemming from them, international relations have failed to abolish these hybrid armed conflicts which conceal their aggressors and real interests.

Such threats require a strong Navy and a larger participation and cooperation in the South Atlantic, such as the greater appreciation of the South Atlantic Peace and Cooperation Zone (ZOPACAS) as an instrument of foreign policy to strengthen strategic dissuasion.

In short, we must understand that the Blue Amazon and its plentiful resources, associated with Brazil's regional strategic position give rise to numerous challenges and threats to national waters; among them, its extensive coast and significant jurisdiction; the great and complex actions resulting from international rights and commitments; multiple national and international interests; the needed heightened awareness of these issues in the Brazilian population; and coordinated actions to deal with plural interests.

We should reiterate that, today, the old notion that "Brazil lacks enemies" since it is a peaceful country is definitely inadequate for our reality. Within an international context, whose hybrid and multifaceted threats are increasingly complex, the greatest challenge for a nation is correctly assessing prospective scenarios and adequately preparing for their confrontation.

Thus, sizing the Navy to counter its antagonistic forces must conform to the importance of Brazil's political-strategic insertion in the international scenario, due to its economic greatness and regional influence, which society must equally perceive and ratify. Moreover, we need to stimulate the development of a defense mentality in the Brazilian society to highlight the importance of all opposition to national interests.

MARINE-NAVAL STRATEGIC CONCEPT

In view of the many threats to Brazilian sea affairs, we need to guide the adoption of a deterrent, proactive, forceful force at our seas and inland waters in permanent defense of national interests.

Thus, the PEM 2040 formulated the Naval Strategic Concept by renewing and innovating some theoretical-doctrinal concepts, such as:

- the new paradigm of COMBAT FOR THE SEA to complement the classic COMBAT AT SEA;
- PROACTIVE DEFENSE, emphasizing action initiatives;

- the emphasis on NAVAL DIPLOMACY as a cooperation and dissuasion instrument at the service of the country; and
- Control and Protection DEFENSE GRADIENTS to optimize efforts to implement a defensive system, due to the approximation to critical maritime infrastructure and areas essential to the survival and prosperity of the nation.

We will briefly show some of these concepts below. The classical **COMBAT AT SEA** paradigm – whose objectives are outlined on land, and incorporate maritime spaces as its operation theater, is maintained in our doctrine, from which Naval War Operations and Actions face organized adversary forces.

Moreover, the sea and its intrinsic, valuable resources became a potential source for conflicts, evidencing a new paradigm, **COMBAT FOR THE SEA**. We need many activities associated with maritime security, since States, actors, and antagonistic phenomena motivated by economic, social, ideological, environmental, and private interests (sometimes in symbiosis with state entities) can challenge our national sea affairs.

When prioritizing objectives and designing defense systems, we should consider the need for anticipatory, initiative actions, and spatial dispersion; in addition to the relevance sea and fluvial affairs have on the national life.

Thus, alongside a reactive defense, we must conceive proactive defensive systems in priority areas and interests. Such a system must be aware of the situations and quick to make decisions to timely provide mobile and/or predisposed assets in the areas to be protected to deter and/or neutralize any threat to priority national sea affairs.

Provided for in this Plan, the “DEFENSE-2” Naval Strategic Action asserts that a proactive defensive system thus configured demands expressive and continuous resource allocation. It requires, for example, Command and Control (C2) subsystems that incorporate new data science technologies, such as Artificial Intelligence.

Moreover, it must timely combine autonomous and manned assets that will compose the Navy of the Future (2040), from a technological prospect incorporating military innovations to the Navy, and its doctrinal and organizational aspects.

On the other hand, if navies of strategically active states prepare against threats, their design can also exploit opportunities that, when properly employed, can avoid or deter intentions against their national

interests. Thus, directing the Brazilian Navy both at threats and opportunities is essential for achieving and preserving national objectives.

Naval diplomacy strengthens state authority, and is an excellent instrument in international relations since ships can freely sail various seas and rivers. Common to all navies with some operational capability is the potential to extend across a broad spectrum of activities – from competition, with actions such as coercion, to cooperation – strengthening mutual trust and mitigating future antagonisms.

In this context, we should mention actions of naval diplomacy: the Brazilian participation with warships and in the Command of the Marine Task Force of the United Nations Interim Force in Lebanon (UNIFIL-FTM); combined operational missions in the Gulf of Guinea; and leadership in regional forums, such as the South Atlantic Peace and Cooperation Zone (ZOPACAS), in the quest to improve surveillance and defense mechanisms of its maritime communication lines in the South Atlantic.

NAVY STRATEGIC MAP

Thus, we move to the fourth chapter of the Plan, its executive part, of a more administrative and managerial character, guided by the Navy Strategic Map, showing its mission, vision, and Naval Objectives.

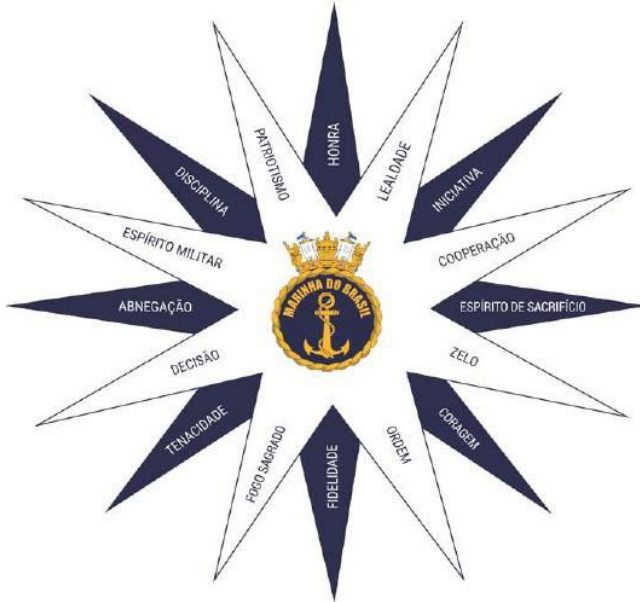
We should remember the mission of the Brazilian Navy, based on constitutional precepts and a complementary law:

“[...] develop and employ Naval Power in the defense of the homeland, in accordance with the Federal Constitution and other laws; to safeguard the branches of state; and, by initiative of any of these branches, to ensure law and order. The Navy also acts under mandate of international organizations and in support of the country’s foreign policy. The Naval Force also fulfills subsidiary duties provided in law, especially those related to “Sea Authority”, for the protection of national interests.”

The Vision for the Future of the Brazilian Navy, in turn, points to “a **modern, prepared, motivated**, and technologically independent force conforming to the international, political-strategic stature of Brazil, capable of contributing to homeland defense, and safeguarding national interests at sea and in inland waters, in line with societal desires.”

In addition to its Mission and Vision, naval organizational values also express its naval strategic identity, representing the principles guiding the actions and conduct of its employees, managers, and authorities.

The “*Rosa das Virtudes*” (Rose of Virtues) is a set of principles and attitudes expressing these values.



More than a mere statement, these institutional reactions show the values with which it faces its challenges.

All navy personnel must know them, due to how essential they are for achieving Naval Objectives.

Objetivos Navais

Contribuir para defesa da Pátria	Obter a Capacidade Operacional Plena
Prover a Segurança Marítima	Desenvolver a Capacidade Cibemética na MB
Contribuir para a Garantia dos Poderes Constitucionais e da Lei da Ordem	Aprimorar as Inteligências Estratégica e Operacional
Cooperar com o Desenvolvimento Nacional	Ampliar a consciência Situacional Marítima nas Áreas de Interesse
Apoiar a Política Externa	Aprimorar a Gestão de Pessoas
Modernizar a Força Naval	Aprimorar a Gestão Orçamentária, Financeira e Administrativa

Thus, the Navy Strategic Map shows the twelve Naval Objectives in the naval policy, distributed in interconnected perspectives (institutional, processual, and societal), in which the previous ones contribute, in general, to accomplishing the later ones.

This distribution aims to objectively convey how the Navy processes the resources allocated to it.

STRATEGIC PROGRAMS

After the Naval Objectives, we reach the last chapter of the 2040 EMP, which describes Naval Strategic Actions, Naval Strategies, and the resulting Strategic Programs.

Rather than deepening the analysis of the 16 Naval Strategies and 51 Naval Strategic Actions in the 2040 EMP, we aim to briefly discuss some of the Navy's seven Strategic Programs. Without exhausting the subject, we will describe the following programs:

- “Personnel - Our Greatest Asset;”
- “Naval Nuclear Program;”
- “Construction of the Naval Power Core;”
- “Blue Amazon Management System (SisGAAz);” and the
- “Maritime mentality”

“PERSONNEL - OUR GREATEST ASSET” PROGRAM

The “Personnel – Our Greatest Asset” program aims to improve personnel management systems and procedures to provide the Navy with the right persons, with the right training, in the right place, and at the right time to fulfill the mission of the Brazilian Navy.

The program gathers personnel subprograms and projects either in action, or in planning, and focuses on five strategic axes:

Personnel Management Modernization, Training Improvement, Integrated Health, Naval Family, and the Navy Olympic Subprogram (PROLIM).

The Navy attaches significant value to training.

NAVY NUCLEAR PROGRAM (PNM)

The Navy Nuclear Program (PNM) exists since 1979 with two main purposes: secure the nuclear fuel cycle, and develop and build a nuclear power generation plant; both fundamental to designing and building conventional nuclear-propelled submarines, which will give the National Defense a new dimension.

Securing the nuclear fuel production cycle aims to develop and improve uranium enrichment for peaceful purposes. Uranium hexafluoride (UF₆) produces fuel on a demonstrative scale. The next step will be industrial-scale fuel production, one of the most important steps in a nuclear program.

Securing this technology provides Brazil with an alternative for the domestic consumption or export of energy.

The Program faces another significant challenge: designing a nuclear reactor prototype; a model of the component that will compose the turbine propelling nuclear submarines.

Both preparing the prototype and testing its effectiveness will take place in the Nuclear-Electric Generation Laboratory (LABGENE), located in the municipality of Iperó, in the state of São Paulo; it reproduces on land the nuclear plant of the future conventional nuclear-propelled submarine.

Brazil will build turbines and generators in partnership with the national industry. Moreover, the French company *Direction des Constructions Navales et Services* (DCNS) has trained Brazilian companies within the technology transfer and nationalization program provided for in the project.

CONSTRUCTION OF THE NAVAL POWER CORE PROGRAM

Another Strategic Program developed by the Navy is the Construction of the Naval Power Core. Among its resulting Programs, we highlight:

- PROSUB – Submarine Development Program
- Surface Vessel Development Program (PROSUPER), with the construction of five frigates, five offshore patrol ships (NPaOc), and one logistic support ship;
- Sea Control Ship Acquisition Program;
- 500 and 1800-ton Offshore Patrol Ship construction program;
- National Surface Anti-Ship Missile Project (MANSUP).

SUBMARINE DEVELOPMENT PROGRAM (PROSUB)

The Submarine Development Program (PROSUB) is currently the Navy's highest priority. Brazil signed documents with France for a Strategic Partnership with the following goals:

- construction, in Brazil, of four *Scorpène* submarines adapted to Brazilian naval requirements, and transferring project technology;
- design and construction of the Brazilian conventional nuclear-propelled submarine.
- design and construction of a submarine-dedicated shipyard and support base; and
- the technology transfer program.

As part of the project, the Metal Structure Manufacturing Unit (UFEM), an industrial infrastructure for submarines, assembles, since 2013, sections such as bulkheads, decks, tanks, fasteners, and hull penetrators.

In 2014, the main building of the Shipyard was inaugurated, and in 2020, the Madeira Island Submarine Base. Construction of the remaining facilities is in progress.

Delivering important project units allowed construction of three of four conventional submarines to begin; they are now in different phases of an integrated schedule. In addition to ensuring the national sovereignty and protection of its waters, PROSUB is one of the largest strategic projects for absorbing and transferring technology, placing Brazil among the few countries to have secured nuclear technology.

Due to its greater mobility, autonomy, and submergibility, nuclear submarines have a strong deterrent presence, discouraging possible threats.

PROSUB stands out for the high technical qualification of its personnel who have learned how to independently design and build submarines. To secure this technology, hundreds of Brazilian engineers, specialists, and workers underwent training in France between 2010 and 2012, and are currently dedicated to multiplying this knowledge in implementing this Program.

The first *Scorpène* submarine built in Brazil was launched on December 14, 2018. In May 2020, the Riachuelo submarine performed propulsion tests. On December 11, 2020, the submarine Humaitá was launched; others will follow every 18 months until 2023. The first Brazilian nuclear submarine is due to 2031.

OBTAINING SURFACE VESSELS PROGRAM (PROSUPER)

Another program within the Construction of the Naval Power Core is the Program for Obtaining Surface Vessels, or PROSUPER. This project includes the construction, in a Brazilian shipyard, of escort ships, including Tamandaré-class Frigates. We expect PROSUPER ships to provide a technological leap for the national defense industry, which could generate thousands of direct and indirect job opportunities.

The Tamandaré-class Frigates Project began in 2017 aiming to renew the squadron with four modern, technologically complex vessels, built in the country, due to between 2024 and 2028. These powerful ships will be able to protect the extensive Brazilian marine area, conduct search and rescue operations, meet international commitments, among other tasks.

On March 8, 2019, the final proposal of the Águas Azuis Consortium won the best offer for the acquisition project of these ships. The selection process employed the expertise of the Navy staff and had the specific technical support of Fundação Getúlio Vargas and the National Bank for Economic and Social Development.

ATECH, EMBRAER S.A and THYSSENKRUPP comprise the Consortium.

The selected proposal contains a project for an Intellectual Property Ship belonging to the German company TKMS, based on MEKO A100-class vessels.

Developing the technologically complex Tamandaré-class Frigates will strengthen the national productive structure, generating thousands of direct and indirect jobs opportunities.

500 AND 1800-TON PATROL SHIP BUILDING PROGRAM

Also belonging to PROSUPER, the patrol vessel construction subprogram contains projects for constructing, in the country, 1800-ton offshore (NPaOc-BR) and 500-ton patrol ships.

These assets will be similar to those already available, such as the Amazonas-class NPaOc and the Macaé-class NPa; primarily responsible for supervising seas and rivers to ensure the defense of ports, secure offshore oil platforms, preserve environmental protection areas and, in

collaboration with other agencies, repress illicit activities, especially illegal fishing, smuggling, and drug trafficking.

NATIONAL ANTI-SHIP SURFACE MISSILE PROJECT (MANSUP)

We should also mention the National Anti-ship Surface Missile project (MANSUP), created to develop without reverse engineering, an anti-ship missile system similar to the Block 1 Exocet MM-40 missile, to be launched from the existing system onboard of Brazilian ships. It aims to meet the demands of the operating sector and eliminate external dependence by replacing currently existing Exocet missiles, and, consequently, conquer new technologies, modernize the Brazilian industrial park, and improve the intellectual capacity of defense professionals. On July 10, 2019, the Brazilian Navy launched its third missile prototype, attesting the good performance and harmonious behavior of all subsystems.

BLUE AMAZON MANAGEMENT SYSTEM (SisGAAz)

SisGAAz began in 2015, and consists in a system to develop an intelligence, and search and rescue tool for military and civilian use. Fully developed by the Brazilian Navy, it features an interface whose sensor network, combined with collaborative information, allows data fusion and clarification, forming a unique operational framework providing an instantaneous picture of what is happening in the controlled area.

It also indicates possible illegal activities or irregularities requiring government investigation.

MARITIME MENTALITY PROGRAM

This program aims to expand the conviction in the Brazilian society of the importance of the marine environment and its resources for the development of the country. Strengthening the Brazilian maritime presence shows that the sea is more than our vocation, it is our destiny, the guarantee of wealth and prosperity for future generations.

Among the various actions provided for in the program, we mention PROANTAR (The Brazilian Antarctic Project), aiming to promote diversified scientific research in the Antarctic and ensure the Brazilian participation in international forums. High-level scientific research in

Antarctica conducted by PROANTAR is a requirement for its permanence as a consultative member of the Antarctic Treaty.

FINAL CONSIDERATIONS

In conclusion, we must highlight the benefits the programs and projects shown, inspired by the guidelines and concepts set out in the PEM 2040, represent for our country.

We should, then, mention the following advantages:

- Contribute to Homeland Defense, provide marine security, support foreign policy, and contribute to the guarantee of law and order, following the previously established Naval Objectives;

- The prospect of generating thousands of direct and indirect job opportunities;

- Stimulating science, technology and innovation, encouraging research; and

- Improving training

Moreover, we highlight an improved radiopharmaceutical production; Brazilian Naval Industry fostering; their multiplier effects on the economy, such as production, wages, and tax collection; and national development.

The Plan also shows the effort of the Brazilian Navy to sensitize the Brazilian society to the need for expansion of Defense investments, for the sake of our future.

Finally, as a final message, in view of the described strategic imperatives, we highlight the need to properly dimension the Armed Force Brazil needs since the Navy may need to undertake the proactive defense of the Blue Amazon and other sea affairs.

Let us be aware of our mission, with our souls at sea, to inform and raise awareness among the Brazilian society that the Defense of the Motherland begins on her waters.

FOR A STRONG NAVY AND A SOVEREIGN BRAZIL!

Received on: 03/04/2021

Accepted on: 06/02/2021