

NATIONAL DEFENCE AND SECURITY SECTOR POLICIES DEVELOPMENT: THE INTELLECTUAL PROPERTY AND INNOVATION MANAGEMENT AT THE BRAZILIAN ARMED FORCES

FORMULAÇÃO DE POLÍTICAS SETORIAIS EM DEFESA NACIONAL E SEGURANÇA: A GESTÃO DE PROPRIEDADE INTELECTUAL E INOVAÇÃO NAS FORÇAS ARMADAS

NATIONAL DEFENCE AND SECURITY SECTOR POLICIES DEVELOPMENT: THE INTELLECTUAL PROPERTY AND INNOVATION MANAGEMENT AT THE BRAZILIAN ARMED FORCES

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ABSTRACT

This paper aims to analyze the recent public policies development, at the Brazilian federal government, and more specific at the defense and security sector, focusing on sectoral specificities related to intellectual property and innovation management issue. Through literature review, it is possible to see the maturing of such policies, since the creation of the Ministry of Defense to the joint publication of the National Defense Policy (NDP), the National Defense Strategy (NDS) and the National Defense White Paper (NDWP) in 2013. Subsequently, there is the relationship between the NDP and the NDS with other public policies, such as the Productive Development Policy (PDP), the Bigger Brazil Plan (BBP) and the National Strategy for Science, Technology and Innovation (NSSTI). Then the special rules for purchasing, hiring and developing products and defense systems were considered. After the establishment of this theoretical framework, the Intellectual Property Policy and Innovation are analyzed, under the Brazilian Defense Ministry and the three Armed Forces: Navy, Army and Air Force, investigating up and concluding to what extent such policies are consistent with the objectives and principles set by the 1988 Federal Constitution.

Keywords: Policies. Defence. Brazil. Intellectual Property. Innovation.

RESUMO

O presente artigo visa realizar uma breve análise a respeito da recente formulação de políticas públicas em defesa e segurança, na esfera do governo federal, enfocando as especificidades setoriais relativas à temática da propriedade intelectual e gestão da inovação. Através da revisão da literatura, verifica-se o amadurecimento de tais políticas, desde a criação do Ministério da Defesa, até a publicação conjunta da Política Nacional de Defesa (PND), da Estratégia Nacional de Defesa (END) e do Livro Branco de Defesa Nacional (LDBN) no ano de 2013. Posteriormente, verifica-se a relação entre PND e END com outras políticas públicas, tais como a Política de Desenvolvimento Produtivo (PDP), o Plano Brasil Maior e a Estratégia Nacional de Ciência, Tecnologia e Inovação (ENCTI). Em seguida, verificam-se as normas especiais para as compras, contratações e desenvolvimento de produtos e de sistemas de defesa. Após o estabelecimento deste referencial teórico, são analisadas as Políticas de Propriedade Intelectual e Inovação propriamente ditas, no âmbito do Ministério da Defesa e das três Forças Armadas (Marinha, Exército e Aeronáutica), investigando-se e concluindo-se em que medida tais Políticas estão consentâneas aos objetivos e princípios fundamentais traçados pela Constituição Federal de 1988.

Palavras-chave: Política. Defesa. Brasil. Propriedade Intelectual. Inovação.

RESUMEN

El presente artículo tiene como objetivo hacer un breve análisis acerca de la reciente formulación de políticas públicas en defensa y seguridad, en el ámbito del gobierno federal, centrándose en las especificidades sectoriales en el tema de la propiedad intelectual y gestión de la innovación. A través de la revisión de la literatura, comprueba la madurez de este tipo de políticas, desde la creación del Ministerio de Defensa, hasta la publicación conjunta de la Política Nacional de Defensa (PND), Estrategia Nacional de Defensa (END) y del Libro Blanco de Defensa Nacional (LDBN), en el año 2013. Después, encuéntrase la relación entre PND y END con otras políticas públicas, como la Política del Desarrollo Productivo (PDP), el Plan Brasil Más Grande y la Estrategia Nacional de Ciencia, Tecnología e Innovación (ENCTI). Enseguida, se verifican las normas especiales para las compras, contrataciones y desarrollo de productos y sistemas de defensa. Después del establecimiento de este marco teórico, son analizadas las Políticas de Propiedad Intelectual e Innovación, en el ámbito del Ministerio de Defensa y las tres Fuerzas Armadas (Armada, Ejército y Fuerza Aérea), investigándose y concluyendo en que medida tales Políticas son consistentes con los objetivos y principios fundamentales establecidos por la Constitución Federal de 1.988.

Palabras clave: Política. Defensa. Brasil. Propiedad intelectual. Innovación.

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I INTRODUCTION

Law 10.973, enacted on December 2, 2004 (“Innovation Law”) opened a new range of possibilities for the federal public administration, by establishing measures aimed at fostering innovation and scientific and technological research in the productive environment, targeting qualification, technological autonomy and the industrial development of the Country (BRASIL, 2004a)³.

Specifically with respect to the national defense and security sector, the regulation of the intellectual property (IP) and innovation management policies at the Ministry of Defense (MD) and the Three Armed Forces, which recently, pursuant to provisions of Law 10.973/04, established their Technological Innovation Nuclei (NITs) at their Scientific and Technological Institutions (ICTs), the agencies that are in charge of scientific or technological basic or applied research.

Besides being motivated by the enactment of the Innovation Law, the design of this legal framework keeps close ties with prior legislative documents, such as, the National Defense Policy (PND) and the National Defense Strategy (END), and other more recent related documents (as for example the new National Defense White Book, – LBDN). It is for this reason that, despite the key focus of this paper is on the management of intellectual property and innovation, a brief retrospect is needed on the development of the national defense and security policies, in order to set, even if minimally, the present subject into context.

Ab initio, it should be noted that sector specific national and security policies are not insulated from each other. Actually, there is a strong interaction between the PND and the END, with, for example, other public policies, as will be shown by the brief considerations on the Productive Development Policy (PDP), the Greater Brazil Plan and the National Science, Technology and Innovation (ENCTI).

On the other hand, the special rules for procurement, contracting and development of products and defense systems — the sector policy issued under Law nr. 12.598/2012, and regulated by Decree nr. 7.970/2013 — are also part of this Science, Technology and Innovation legal framework. This legislation is of utmost importance to the sector as it provides the legal conditions needed to promote local technological development by national capital controlled companies, and therefore, should not be considered separately.

Within this context, and with the general objective of producing a brief analysis of the development of the intellectual property and innovation management policies, in the national defense

and innovation sector, this paper comprises three sections. The purpose of the first section is to place the subject into context through some brief considerations about the National Defense Policy (PND), and the National Defense Strategy (END) and other related public policies. In the second section, also with the purpose of drawing the environment of the proposed subject, reference is made to more recent policies such as the National Defense White Book (LBDN) and Law 12.598/2012, regulated by Decree 7.970/2013. The third and last section the subject itself is discussed by analyzing the regulations of the intellectual property and innovation management, at the Ministry of Defense (MD) and in the three Armed Forces.

In order to achieve the objective proposed for this paper, a bibliographic and documentary research was carried out to investigate the most relevant normative documents, with reference made to some of the strategic projects that are now underway at the three Armed Forces, and last, a conclusion is presented about the contribution these policies may give to the Brazilian state in fulfilling the social, technological and economic development interests. Please note, however, that this paper does not assume to have exhausted the subject, and is descriptive, with the purpose of prompting the debate and encouraging other researches on the theme.

2 THE NATIONAL DEFENSE POLICY (PND) AND THE NATIONAL DEFENSE STRATEGY (END)

The objective of this section is to briefly contextualize the process whereby the subject of intellectual property and innovation management was dealt with by the national defense and security policies, since the first “National Defense Policy”, in 1996 up to the joint issue of the current National Defense Policy (PND) and the National Defense Strategy (END), as well as through the interfaces between these legal instruments with public policies implemented by other sectors, such as the Productive Development Policy (PDP), the Greater Brazil Plan and the National Science, Technology and Innovation Strategy (ENCTI).

2.1 The National Defense Policy (PND)

The current National Defense Policy (PND) has its origin on the issue of the then “National Defense Policy” in 1996, during the Fernando Henrique Cardoso (FHC) administration, as a logical step towards the establishment of the Ministry of Defense in 1999, based on arguments about the need for integration with the foreign policy and the interoperability of the forces (ALSINA JR, 2003, p. 78).

³ Art. 1, of Law 10.973/04 (“Innovation Law”).

The 1996 text makes no express mention to the subject of intellectual property and innovation management, however, a first approach is found in one of the guidelines⁴ established for the achievement of proposed objectives: “to look for a level of scientific research, technological development and production capacity so as to minimize the external dependency of the Country with respect to strategic resources of interest to national defense” (BRAZIL, 1996b, p. 11).

Today, when reading this provision, based on the current approach adopted by the "Innovation Law" it can be inferred that the search for a high level research and development and consequent production capacity increase, can only be achieved by managing the process of innovation and by affording appropriate protection to intellectual property thus, reducing external technological dependency with respect to defense products and systems.

After an interval of nine years, the then President of the Republic Luis Inácio da Silva (Lula), the successor of FHC, approved the second “National Defense Policy”. This text issued in 2005 is based on the document issued in the FHC administration, adapting it to the national and international reality and also seeking “increased accuracy of certain objectives that were not fully defined in the previous PND” (OLIVEIRA, 2013, p. 4). This new text included a list of six “national defense objectives”.

Besides amending the wording of these objectives, the “Strategic Guidelines” of Decree nr. 5.484/2005 added an express provision on innovation to item 6.9: “Raising the level of the qualification of the Country in the field of defense is critical, and shall be achieved through permanent involvement of the government and the industrial and academic sectors, focusing on scientific and technological production and innovation” (BRAZIL, 2005).

Recently, the text of the current National Defense Policy was ratified by the National Congress jointly with the new edition of the National Defense Strategy and the release of the National Defense White Book (BRAZIL, 2013a).

The PND now in effect is a reformulation of the policy enacted under Decree nr. 5.484/2005 at the time of the Lula administration. Its introduction states that this policy is the “highest level document providing on the planning of actions aimed at national defense and coordinated by the Ministry of Defense”. Innovating in relation to the previous texts, the document underlines that the PND assumes that the defense of the Country must be inseparable from its development, thus “providing it the indispensable shield” (BRAZIL, 2012e, p. 11).

An important change introduced by the text of the current PND refers to the so-called “national defense objectives (item 6). Five new objectives were added to

those designed in 2005, and item IX deserves special mention: “to develop the national defense industry, aiming at the achievement of autonomy with respect to critical technologies” (BRAZIL, 2012e, p. 30).

Besides the significantly broader scope of the newly established objectives, the provisions of the Strategic Guidelines (item 6.9, of Decree nr. 5.484/2005) were also reformulated to state that the process of innovation, and the respective protection of industrial property, is to take place “by encouraging and fostering the industrial and academic sectors. The development of national industry, which includes mastery of dual use technologies, is critical to the supply of defense products” (BRAZIL, 2012e, p. 32).

From this updated focus, the new text (PND guideline 7.7, PND) calls on the government, industrial and academic sectors - the so called triple helix⁵ of relations - to jointly contribute to enable meeting the need for defense products (PRODE), supported by technologies mastered by the country.

It can be evidenced, therefore, that the PND has made significant progress since the “National Defense Policy” issued in 1996 in terms of innovation management and, also, on the aspect of the scope of the joint action of the defense sector and other sectors, which also happened in the two editions of the National Defense Strategy (END), as shown in the next sub-section of this paper.

2.2 The National Defense Strategy (END)

In 2003 — therefore, five years after the first edition of the END — the newly elected government organized a “cycle of discussions on defense and security”, which can be seen as the cornerstone of the “Analysis of the Defense Industry” resulting in relevant publications on the subject, such as “Pensamento brasileiro sobre defesa e segurança” and “As Forças Armadas e o desenvolvimento científico e tecnológico do país” (DAGNINO, 2010, p. 15).

Under provisions of Decree nr. 6.703, issued on December 18, 2008, the National Defense Strategy was then sanctioned by the President of the Republic (END). At that time, the END already stated that it was “inseparable from the national development strategy. The strategy motivates the END. And the END shields the strategy. Each one of these strategies strengthens the reasons of the other. In both we find a call for the awakening of nationality and construction of the nation. Defended, Brazil will be able to say no, when it has to say no” (BRAZIL, 2008; 2012e, p. 43).

⁵ Model proposed by Leydersdorff and Etczowitz (1995) and discussed by 90 countries attending a workshop in Amsterdam (January 3-6, 1996), pursuant to “Emergence of a triple helix of university-industry-government relations”.

⁴ Política de Defesa Nacional (1996), Nº 5. Diretrizes, letra “r”.

This first edition of the END included several Science, Technology and Innovation provisions. Special attention should be given to the so called “opportunities to be explored” from the identification and analysis of the key strengths and weaknesses of the Brazilian defense structure; such considerations were fully reproduced in the current edition of the END:

- optimization of efforts in Science, Technology and Innovation for Defense, by means of, among other, of the following measures:
 - (a) further integration of civilian and military scientific and technological institutions and the national defense industry;
 - (b) definition of dual use technology; and
 - (c) encouragement to research and development of products of interest to defense;
- (BRAZIL, 2008; 2012e, p. 114).

It is also worth mentioning that the END 2008 included a specific provisions on the “Industry of Defense Materials” mentioning the “structuring program of the Industrial Defense Complex”, to be managed by the Ministry of Defense and coordinated by the Ministry of Science and Technology, whose objective was to “resume and foster the growth of the installed industrial base, increasing supply to the Armed Forces and exports” (BRAZIL, 2008).

This provision already revealed the intent to have coordinated actions implemented by the defense sector and other relevant sectors in the country. This project of joint action was described in further detail in the subsequent editions of the END, especially in the chapter reserved for the “Implementation Measures”, as for example, action by the Ministry of Defense jointly with the other Ministries of Foreign Affairs, Finance, Development, Industry and Foreign Trade, Planning, Budget and Management, Science, Technology and Innovation and with the Secretariat of Foreign Affairs of the Presidency of the Republic (BRAZIL, 2008; 2012e, p. 138-139).

Currently, the END has three structuring axes: 1) organization of the Armed Forces; 2) reorganization of the Industrial defense Base (BID) and; 3) composition of Armed Forces contingents. For the purposes of this study, special interest is directed to the second axis of the END, which is fully aligned to the PND: “reorganization of the Industrial Defense base, to make sure that Armed Forces demand for such products is met based on technologies mastered locally, preferably the dual (military and civilian) use technologies.”

Pursuant to the END, the Industrial defense base is formed by the:

- integrated set of state and private companies and civil and military organizations, carrying out or engaged in research, design, development, industrialization, production, repair, conservation, overhaul, transformation, modernization or maintenance of defense products (Prode) in Brazil (BRASIL, 2012e, p. 99).

Amarante (2012, p. 39) remarks that the END “established guidelines encouraging interaction between the most diverse types of institutions and companies engaged in integrated work targeting BID strengthening”, and the key strategic objective of the END is “the scientific technological qualification of the country in the military sector”.

It should be noted that the current END provides that the purpose of the Science, Technology and Innovation Policy for National Defense is foster scientific and technological development and innovation in areas of interest to national defense:

This shall be carried out according to a national plan aimed at the development of technology-intensive products, relying on the joint involvement of the civil and military scientific and technological institutions (ICT), the industrial sector and the university, with definition of priority areas and their respective technologies of interest, and the establishment of instruments to encourage the development of research on materials, equipment, defense or dual use systems (...) (BRAZIL, 2012e, p. 103).

About the equipment and dual use defense systems, Longo (2007, p. 122) explains that that the term “dual use technologies” was coined by the Americans, and “dual use technology” can be defined as the technology enabling its use to produce or improve goods or services for civil or military user”. Also, when talking about something he calls “the era of dual use technologies, Dagnino (2010, p. 168), remarks:

As the speed at which innovation is introduced into the civil sector increases, the military organizations in most of the weapon system producing countries have turned their attention to the national and international civil sector to look for dual use technologies and revolutionary scientific discoveries.

Last, about the current text, it can be evidenced that as a policy aimed at the achievement of the objectives set in the PND, the END naturally incorporates several innovation management concepts as it was ratified within the context of Law 10.973, enacted on December 2, 2004 (the “Innovation Law”) already in effect. Additionally, the END (just like the PND) interacts with other sectoral public policies that will be presented in the next sub-section.

2.3 The Connection Between the PND and the END with Other Public Policies

Fried and Silva (2011, p. 100) underline that “the ministries of Defense and Science and Technology, for example, should walk hand in hand, considering that the progress in the C,T&I (Science, Technology and Innovation)⁶ area is critical to the field of Defense”. The

⁶ According to Hayashi et al (2013), since August of 2011 the MCT was renamed MCTI.

authors refer to the publication of *Concepção Estratégia, Ciência, Tecnologia e Inovação de Interesse Nacional* — jointly published by these two ministries in 2003 — calling attention to the fact that the major challenge of overcoming technological dependency is a key factor for Brazil to bridge the divide in the fields of science, technology and innovation.

On the other hand, Santos (2011, p. 59, 60) shows that another document issued by *Escola de Comando e Estado-Maior do Exército (ECEME)* and named *Diagnóstico e Propostas de Ações Estratégicas – Projeto EB 2030*, already mentioned collaborative actions between governmental bodies:

The Productive Development Policy (PDP) is an example of the already existing partnership between the ministries of Science and Technology, Development, Industry and Foreign Trade, Foreign Affairs and Defense (MCT, MDIC, MRE and MD), whose purpose is to boost industrial production in the different areas, including defense, which may drive the national scientific-technological development..

Published by the Federal administration in 2008, the PDP determined that the “Industrial Defense Complex” was one of the six industrial areas of interest to the country⁷, having, for this purpose, designed a Specific Mobilization Program (BRASIL, 2011b, p. 30). On this aspect, Longo e Moreira (2009, p. 85) say the establishment of mobilization programs is “a viable alternative to tackle the technological limitations in strategic areas. Hence, they can be designed and implemented to generate specific qualifications and to eliminate the existing vulnerabilities.”

According to Leske (2013, p. 11), this policy was already taking shape jointly with the National Defense Strategy (in the edition issued in the same year of 2008) as a systemic set of policies directed to industrial development and innovation in this sector, involving “production, technological and institutional aspects”. As Prado Filho (2014, p. 38) notes, the PDP

listed the Industrial Defense Complex as one of the Mobilization Programs in Strategic Areas recognizing sector relevant capacity to create knowledge, increase productiveness and generate innovation of critical relevance to the Brazilian production chain, enabling a virtuous and sustainable development cycle.

Later on, the relationship between Science, Technology and Innovation in the defense area became even stronger as of the publication of the Greater Brazil

Plan (that superseded the PDP), where the Federal Administration outlined its industrial, technological, service and foreign trade policy for the 2011 - 2014 four year period, with main focus on “the encouragement to innovation and national production in order to increase industry competitiveness in the domestic and foreign markets” (BRAZIL, 2012e, p. 103).

Along this legislative evolution, the sectoral policies aimed at national defense and security were kept in line with the industrial technological, service and foreign trade policies designed in the Greater Brazil Plan. The PND assigns priority to three strategic sectors: — the space, cybernetics and nuclear sectors — and determines, in its item 3.6, that with regard to the international context, if national development and autonomy are to be achieved, autonomous and growing mastery of these sensitive technologies is critical⁸ (BRASIL, 2012e, p. 19).

On the other hand, the END is connected to another important document about coordinated public policies related to the scientific and technological development of the Country: The National Science, Technology and Innovation Policy 2012 – 2015, or simply ENCTI.

Under the ENCTI the Ministry of Science, Technology and Innovation (MCTI) selected priority programs involving the most important chains to drive the Brazilian economy: “information and communication technologies, pharmaceutical and industrial health complex, oil and gas, the industrial defense complex, airspace and areas related to green economy, such as clean energy and social and production development” (BRAZIL, 2012b, p. 54, text highlighted by us).

As to the industrial defense complex, the ENCTI recalls that the search for its recovery was one of the targets established by the 2008 END, and about this important sector it says that:

besides the objective of providing the goods and systems necessary for use by the Armed Forces, it may, in some sectors of science, act as an inductor of technological innovations and extend the use of generated products to civil applications in view of the dual nature of the developments (BRAZIL, 2012b, p. 63).

The integrating nature of the ENCTI also aims at joint efforts and initiatives in the efforts of the “military and civil research institutes, universities and technology centers, resulting in the development of the whole Industrial Defense Base” (BRAZIL, 2012b, p. 64). In this sub-section it can, therefore, be evidenced that the PND and the END are not independent documents, but they actually have significant interactions with other public policies issued by several ministries. On this subject

⁷ According to the PDP: “The Mobilization Programs in Strategic Areas include the Information and Communication Technologies, Nanotechnology, Biotechnology, the Industrial Defense Complex, the Industrial Energy Complex and the Health Industrial Complex (...)” (BRAZIL, 2011, p. 30)

⁸ Longo e Moreira (2009, p. 74) stress certain technologies, whether for civil or military, or yet dual use may be rated as “sensitive”, which means the technologies a given country (or group of countries) deems that access to them needs to be denied, for a certain period of time, hypothetically for security reasons ”.

it should be noted that the joint issue of the PND and the END underlines that these policies are grounded on the assumption that defense must not be a subject to be dealt with just by the military or the government. "In fact, defense must be of interest to society as a whole" (BRASIL, 2012e, p. 7). This involvement of society may be achieved through the joint actions of its various sectors (government, industrial sector, universities, research centers, etc.), thus contributing to Brazilian technological and scientific⁹ production.

3 CONTEMPORARY DEFENSE POLICIES

The objective of this section is to present other more recent policies of the national defense and security sector that supplement the PND and the END, representing the sector legal framework. The National Defense White Book (LBDN) is presented in the first sub-section and next, the second sub-section approaches the special regulations applicable to procurement, contracting and development of defense products and systems pursuant to Law nr. 12.598/2012, regulated by Decree nr. 7.970/2013.

3.1 The National Defense White Book (LBDN)

By the turning of the nineties South Cone countries such as Argentina and Chile issued their "defense white books" (AGUILAR, 2008, p. 3; 6) as well as other world powers, as for example, the United States of America, China, Germany, France, Australia, South Korea, Japan, the United Kingdom, among others (a digital copy of the full text of these documents is available at the Ministry of Defense website)¹⁰.

Issued for the first time, the National Defense White Book (LBDN) is added to the PND and the END as an explanatory document on the activities of the defense sector in Brazil. In the words of the Minister of Defense Celso Amorim in 2012:

The White Book, is actually the indicator of how the position held by Defense in the public agenda in Brazil has changed and of transformation of Defense itself were. Transparency is the core dimension of this transformation strengthened by practical actions to provide full effect to the Access to Information Law within the scope of action of the Ministry of Defense. While at the same time bringing the population closer

to the military issues the transformation of Defense brings the Armed Forces closer to expectations of society (FONTOURA, 2015, p. 61).

While the PND establishes National Defense objectives and provides guidance to the State on how to achieve them, and the END determines how to enforce the provisions of the PND (BRASIL, 2012e, p. 7), the National Defense White Book was specifically designed to present detailed strategic, budgetary, institutional and material data on the Armed Forces (art. 9, § 2, of Supplementary Law nr. 97/99)¹¹.

This provision of the Law that sets the general rules for the organization, preparation and use of the Armed Forces (LC 97/99) also says that the following topics will also be approached by the LBDN: strategic scenario for the 21st century; national defense policy; national defense strategy; modernization of the Armed Forces; streamlining and adaptation of the defense structures; economic support to national defense; the Armed Forces: Navy, Army and the Air Force; and peacekeeping operations and humanitarian aid (BRASIL, 1999).

In addition to this mandatory information, the text of the LBDN explains the relationship between defense and the other state powers by providing that the Ministry of Defense (MD) "shall interact with other ministries for the design and implementation of public policies related to their constitutional and subsidiary duties by means of actions inuring to the benefit of society". Such actions and benefit are exemplified in the LBDN by a description of the links between the MD and other ministries, e.g. the Ministries of Agriculture, Cattle Breeding and Supply; Science, Technology and Innovation; Development, Industry and Foreign Trade; Sport; Social Development and Fight Against Hunger; National Integration; Justice; Health; Finance; and Foreign Affairs (BRASIL, 2012d, p. 176).

Among these joint actions, emphasis is given to the partnership with the Ministry of Science, Technology and Innovation (MCTI) in the "research efforts in the military scientific and technological institutions, aiming at the development of state-of-the-art technologies for the defense system", with some of the defense projects "supported by Financiadora de Estudos e Projetos (FINEP)" (BRASIL, 2012d, p. 188).

Additionally, the LBDN recalls that "the Armed Forces offer valuable science, technology and innovation contributions to the improvement of the level of technological autonomy of the Country", keeping "excellence centers" whose production "has been critical to the scientific and technological breakthroughs in Brazil" (BRASIL, 2012d, p. 214).

Last, when providing on Science, Technology and Innovation the LBDN states that in order to comply with the guidance of the END, the Ministry of Defense,

⁹ According to Escola Superior de Guerra: "The Scientific and Technological expression of National Power preponderantly scientific and technological manifestation of National Power, which contributes to enable the National Objectives to be achieved and kept" (ESCOLA SUPERIOR DE GUERRA, 2014b, p. 85).

¹⁰ Available at: <http://www.defesa.gov.br/projetosweb/livrobranco/paises_livrobranco.php>

¹¹ Provision added by Supplementary Law 136, August 25, 2010.

jointly with other ministries, the corporate sector and the academic environment to integrate the science and technology systems existing in Brazil, adding further that:

Significant savings of means and efforts may be achieved through increased integration between Armed Forces research and development institutions, not just in the implementation of integrated or common interest projects, but also in the exploration of new opportunities in the science and technology area. Increased participation of the civil sector in military projects, including the possibility of transfer of defense budget resources to the civilian infrastructure of science and technology, may also streamline the development of projects of interest to Defense. The interaction between civilian and military research institutions is critical to an actual integration of corporate sector efforts towards the establishment of high technology poles in different areas (BRASIL, 2012d, p. 217).

Thus, the same coordination feature of both the PND and the END can be equally evidenced in the wording of the LBDN, which is also consistent with several provisions of the Innovation Law, as for example, “foster the set up of specialized and cooperative environments of innovation”, “encouragement to the participation of the ICTs in the process of innovation” and “encouragement to innovation in the companies” (Chapters II, III and IV, of Law nr. 10.973, dated December 2, 2004).

3.2 Policies for Procurement, Contracting and Development of Defense Products and Systems

The Brazilian Industrial Development Agency (ABDI), when an interesting study was presented by Ferreira and Sarti (2011) — “*Diagnóstico - Base Industrial de Defesa (BID) Brasileira*” — informed on its webpage that Provisional Measure nr. 544, has been signed in September of 2011, establishing mechanisms aimed at fostering the Brazilian defense industry, bringing relevant incentives to the sector and creating favorable conditions to the development of technologies critical to Brasil” (AGÊNCIA..., 2011). This Provisional Measure was changed into Law nr. 12.598/2012, which among other provisions, establishes special rules for procurement, contracting and development of defense products and systems. Article 2 introduced important concepts into our legal framework, such as: defense product (PRODE); strategic defense product (PED); defense system (SD); and strategic defense enterprise (EED). It also defines “innovation” as the introduction of novelty or improvement in the Prode production environment (BRAZIL, 2012a).

It must be stressed that the enterprises classified as EED must be accredited beforehand by the MD and cumulatively comply with certain conditions: corporate

object involving engagement in or development of research, design, development, industrialization, service rendering, production, repair, conservation, overhauling, conversion, modernization or maintenance of PEDs in the Country; main place of business, management and industrial establishment in the Country; having available in the Country proved scientific or technological knowledge; to make sure that foreign partners or shareholders will not be allowed to exercise voting rights exceeding two thirds (2/3) of the total number of votes that may be cast by the Brazilian shareholders in attendance; and ensure the continuity of production in the Country (BRAZIL, 2012a, art. 2º, item IV).

As to the measures themselves, this law provides that in its relations with Public Power, strategic defense enterprises (EEDs) will benefit from a special regime, admitting the possibility of tenders with participation limited to these enterprises. The law also foresees the existence of technological, industrial and commercial compensation agreements (JUSTEN FILHO 2014, p. 54; 122). It is important to note that such measures should not be viewed simply as the result of the Greater Brazil Plan, “but rather as the result of proposals launched since 2008 and, above all, the END” (LESKE, 2013, p. 141). Added to the C,T&I legal framework, the Law “contributes to strengthen the defense sector” (QUINTAL, 2013, p. 102). Corroborating this interpretation, Longo and Moreira (2013, p. 301) suggest that it represents state effort to act on the regulatory framework seeking to encourage native entrepreneurship through the implementation of measures that tend to create special conditions for the national industrial establishments that did not exist before, opening perspectives of positive results. According to Carvalho (2013, p. 30), by providing on incentives to the strategic defense area, in thesis, Law 12.598/12 fully responds to the claims of the BID. This author also illustrates national interest in the sector by referring to the mergers and acquisitions, and even associations of enterprises to large Brazilian and international groups, such as Odebrecht, OAS, Queiroz Galvão, Andrade Gutierrez, Engevix, Grupo Synergy and Camargo Corrêa and the establishment of the segment Embraer Defesa e Segurança (Embraer Defense and Security). Last, he shows aspects of large projects as for example, the Border Monitoring System (SISFRON), the unmanned aerial vehicle (VANT acronym in Portuguese/UAV in English), development of the first Brazilian geostationary satellite for military communications and massive access to wide band internet in interior areas of the Country, the first Brazilian surveillance and target data acquisition Saber M-60 radar, the KC – 390 cargo carrying aircraft that will replace the 25-year old C 130 Hércules, construction of the first Brazilian nuclear submarine, and another four non nuclear submarines, through the Prosub project, among others (CARVALHO, 2013, p. 35).

Sato (2013, p. 2) observes also that Law 12.598/12 jointly with large national projects “constitute an

invitation to the private sector to increase investments in this area as a partner of the central government”.

Last, the Law was regulated by Decree nr. 7.970, issued on March 28, 2013 assigning to the MD the responsibility for the accreditation of defense products (PRODE), strategic defense products (PEDs) and EEDs, “based on a proposal to be com prepared by the Joint Committee of the Defense Industry (CMID)” (CORREA FILHO et al, 2013, p. 404).

To this date, 64 Strategic Defense enterprises have been accredited by the CMID under provisions of Ordinances 1.346/MD, 1.635/MD, 2.028/MD, 2.639/MD and 249/MD (data available on the website page of the Ministry of Defense: <<http://www.defesa.gov.br/>>).

4 INTELLECTUAL PROPERTY AND INNOVATION POLICIES IN THE NATIONAL DEFENSE SECTOR

Once the legal framework of the defense sector was discussed in the previous two sections, the objective of this last section is to present the sector specific policies for innovation and intellectual property management. To this end, the first sub-section will present MD rules and subsequently the rules issued by the three Armed Forces (Navy, Army and Air Force).

4.1 Regulations of the Ministry of Defense

The management of the process of innovation and its consequent protection afforded by intellectual property rights in the national defense sector is regulated by two main documents: the Science, Technology and Innovation (C,T&I) Policy for National Defense; and the MD Intellectual Property Policy.

Normative Ordinance 1.317/MD was issued in December of 2004, ratifying the Science, Technology and Innovation (C,T&I) Policy for National Defense. With this document, among other provisions, the Ministry of Defense set out the objectives and respective sector-specific C,T&I guidelines. With respect to innovation management, the following provision of the above mentioned norm deserves a special mention:

Art. 2 The objective of the Science, Technology and Innovation Policy (C, T & I) is II – to provide guidance to the institutions participating in science, technology and innovation activities of interest to defense;

III – to establish an environment capable of encouraging research and application of the already existing scientific knowledge;

V - to generate innovative products (...)

Art. 5 These are objectives of the Science, Technology and Innovation (C, T & I) Policy for National Defense: IV - establishment of an environment favorable to innovation and industrial competitiveness (BRAZIL, 2004b).

As evidenced, the purposes and objectives of the National C,T&I Policy for Defense are perfectly aligned to the provisions of the Innovation Law (“encouragement of the establishment of specialized and cooperative innovation environments”, “encouragement to the participation of the ICT in the process of innovation” and “encouragement to innovation in enterprises” - Chapters II, III and IV, of Law nr. 10.973, dated December 2, 2004) and to provisions of the Federal Constitution. On the constitutional aspect of the issue, Barbosa (2002, p. 24) underlines that

(...) both the specific Industrial Property regulations and the other provisions of the 1988 Constitution on technology are in full agreement in assigning fundamental value to the encouragement of the technological development of the Country (which Art. 219 defines as the autonomous development).

Besides that, the other purpose stated in Normative Ordinance nr. 1.317/MD is to foster industrial development (art, 2, item IV), which is supplemented by the objective of contributing to strengthen the national industry (art. 4, item II). On this aspect, the Ordinance is also perfectly aligned to the objectives set forth by the PND, END and the LBDN, and which have already been discussed in the previous sections of this paper.

Last, this Ordinance establishes that

Art. 5. Objectives of the Science, Technology and Innovation (C, T & I) Policy for National Defense:

VI - to further the interests of the different segments of society in the initiatives in the areas of Science, Technology and Innovation focusing on National Defense;

VIII - Integration of the Science, Technology and Innovation (C, T & I) initiatives of interest to National Defense, developed in the Research and Development (R&D) Military Organizations and at the civilian institutes and universities (BRAZIL, 2004b).

At this point the norm aligns itself to one of the chief objectives of the Innovation Law, which is to “foster cooperation between state entities and the private sector, at the different stages of the innovative process from creation of invention up to technology transfer (...)” (FEKETE, 2006, p. 71).

To conclude these comments, pursuant to the above mentioned provisions, Normative Ordinance nr. 1.317/ MD expressly provides that the Navy, Army and Air For Commands are required to design their own specific C,T&I policies (art. 8°).

Besides the C,T&I policy for National Defense, Normative Ordinance nr. 1888/MD, issued on December 23, 2010 approved the Intellectual Property Policy of the

MD. These are the purposes of this norm established in its art. 2:

- I – to supplement the Science, Technology and Innovation Policy for National Defense with respect to intellectual property;
- II – to provide guidance to the actions related to protection of knowledge and the advancements created in its Scientific and Technological Institutions (ICT), including the protections applied for and afforded, as well as technology transfer contracts (BRAZIL, 2010).

The protection of intellectual property, pursuant to the Convention of the World Intellectual Property Organization (Stockholm, 1967) encompasses a broad range of rights afforded, for example to : literary, artistic and scientific works; inventions in all fields of human endeavors; scientific discoveries; industrial drawings; industrial, trade and service marks; protection against unfair competition and “all other rights inherent to intellectual activity in the industrial, scientific, literary and artistic domains” (BARBOSA, 2010, p. 10).

Besides the Convention of the World Intellectual Property Organization, Brazil is one of the signatories of several international agreements and treaties on this field of knowledge, such as the Paris Union Convention (PUC), adopted in 1883, and the Agreement on Trade-Related Aspects of Intellectual Property Rights (TRIPS), negotiated at the Uruguay Round of the General Agreement on Tariffs and Trade (GATT) that led to the establishment of the World Trade Organization (WTO), in 1994.

Besides the international rules there is a broad range of legal instruments providing on protection of such rights, as for example the Federal Constitution, the Industrial Property Law, the Copyright Law, the Software Law, the Innovation Law, and other legal norms.

In the defense sector, following the example of the C,T&I Policy, Ordinance nr. 1888/MD granted authority to the Commands of the Forces to establish specific guidelines for implementation of their own policies, within their jurisdictions, and, also to adjust their internal rules and guidelines on Intellectual property to the above mentioned legislation.

As already mentioned above, the two documents that constitute the basis for the management of the process of innovation and protection to intellectual property in the defense sector evidence significant links with other legal documents, which should also provide guidance on the regulation of this subject matter in each of the Armed Forces.

4.2 Regulations in the Armed Forces

This sub-section will approach the structure of the Technological Innovation Nuclei (NIT) in the three

Armed Forces, as well as the respective Intellectual Property Guidelines, illustrating some of the actions taken by the Navy, the Army and the Air Force on Science, Technology and Innovation, through some of the defense projects that are now in progress and were mentioned in the text of the ENCTI.

Martins (2012, p. 232) says, among the actions taken to promote qualification and technological autonomy towards Brazilian industrial development, the Innovation Law (BRAZIL, 2004a), provided on the establishment of Technological Innovation Nuclei (NIT) at the Scientific and Technological Institutions (ICTs), “with the responsibility to propose, follow-up and evaluate the innovation policies in order to promote protection and maintenance of intellectual property and to transfer the new technologies to the corporate sector”.

As part of the redesign of its Science, Technology and Innovation System (SCTMB), the Brazilian Navy (MB) established the Navy Secretariat of Science, Technology and Innovation (SecCTM), in 2008, and the Navy Technological Innovation Nucleus, in July of 2009, to engage in joint actions with the Science and Technology institutions of the Navy (LITAIFF JÚNIOR et al, 2009, p. 75).

According to data collected in 2012 by the MCTI about the intellectual property policies of the scientific and technological institutions in Brazil (FORMICT Report 2012), the NIT-MB is formed by the following ICTs: Naval Systems Analysis Center (CASNAV), Navy Hydrographic Center (CHM), Navy Technological Center in São Paulo (CTMSP), Institute of Oceanographic Studies Admiral Paulo Moreira (IEAPM), Navy Research Institute (IPqM), Navy Secretariat of Science, Technology and Innovation (SecCTM), Hospital Naval Marcílio Dias (HNMD) and the Marine Corps Technological Center (CTecCFN).

Brazilian Navy Intellectual Property Guidelines (BRAZIL, 2011a) were regulated by Ordinance nr. 79/EMA, issued on April 27, 2011, aiming at the achievement of the following objectives: 1) establishment of an environment capable of fostering Intellectual Property preservation; 2) qualification and acknowledgement of the value of the human resources involved in new knowledge generation and in the Intellectual Property protection processes and; 3) encouragement to the transfer of technologies generated in the MB.

The above mentioned PI Guideline is supplemented by SecCTM Ordinance nr. 26/2011, providing on *Intellectual Property Protection Standards in the MB*. This document establishes the guidelines and the procedures to be followed for protection of intellectual property, technology transfer and trade of C.T&I products and services in the Brazilian Navy.

On the other hand, pursuant to the ENCTI, among the leading projects supported by the MCTI in the

Brazilian Navy, special mention should be made to the full mastery of the Nuclear Cycle, which will result in the development of the nuclear propulsion system for the Brazilian submarine, besides other researches deemed important to the conventional submarine construction program, such as, carbon fiber from precursor fiber PAN (polyacrylonitrile), the TWT type microwave power amplifier, ballistic impact resistant and development of permanent magnet thrusters (BRAZIL, 2012b, p. 64).

As to the Ground Force, the current Science and Technology System of the Army (SCTEx) is now being changed into an Army Science, Technology and Innovation System (SCTIEx) whose purpose is to provide operational advantages, adding value to combat power by meeting the current needs, while at the same time meeting future requirements (PELLANDA, 2013, p. 184).

In this Force, also as a result of the Innovation Law, the institutional decision to establish a NIT came under Ordinance 907, issued on November 23, 2009 which, initially, appointed the Department of Science and Technology of the Army (DCT) to act as the Science and Technology Institution of this Armed Force.

As Azevedo (2013, p. 95) observes, while acting as a NIT, the DCT is in charge of “fostering the development of the national industry aiming at development and production of systems and materials for military use”. According to the FORMICT Report 2012, the Brazilian Army Technology Innovation Nucleus (NIT/EB) comprises the following ICTs: Department of Science and Technology (DCT), Army Communications and Electronic Warfare Center (CCOMGEx), Army Integrated Telematics Center (CITEx), Army Technological Center (CTEx), Army Evaluation Center (CAEx), Military Engineering Institute (IME), the Geographic Service Board (DSG), the Systems Development Center (CDS), the Army Cybernetic Defense Center (CDCiber) and the Manufacturing Board (DF).

The *Intellectual Property Guideline of the Brazilian Army* (BRAZIL, 2014a) is the most recent and was approved by Ordinance nr. 1.137 issued on September 23, 2014. As its text provides, the objectives are: 1) to establish an environment encouraging production of national technology and Intellectual Property preservation; 2) to qualify and acknowledge the value of the humans resources involved in the processes of generation of new knowledge to which protection may be afforded and; 3) to encourage the transfer of technologies generated in the Brazilian Army. It must be stressed that the enforcement of this Guideline is fundamentally grounded on *Chapter III – Attributions and Procedures*, that deals with the management of technological innovation, intellectual property, technology trans and economic gains and also of the innovation encouragement scholarships.

As stated in the ENCTI, the following are highlights among Brazilian Army initiatives: research and development of the Medium Size Armored Personnel Carrying Vehicle on Wheels — VBTP/MR (Guarani), that will be used by several military units and also by the Brazilian UN peacekeeping forces; the family of the SABER (M60 and M200) radars with full Brazilian technology and allowing diversified applications and; the relevant partnership between the MCTI and the Brazilian Army in the cyber defense area (BRAZIL, 2012b, p. 64).

As to the Air Force, Ordinance nr. 14 / CTA/SDE, dated May 19, 2006, determined the establishment of the Technological Innovation Nucleus at the Airspace Science and Technology Department (DCTA), which as stated in the FORMICT Report 2012, comprises the following ICTs: Department of Airspace Science and Technology (DCTA), Air Force Technological Institute (ITA), the Aeronautics and Space Institute (IAE), the Institute of Advanced Studies (IEAv), the Industrial Development and Coordination Institute (IFI), the Flight Research and Test Institute (IPEV), the Airspace Control Institute (ICEA), Barreira do Inferno Launching Center (CLBI), Alcântara Launching Center (CLA), and the Air Force Logistics Center (CELOG).

Under DCTA Ordinance 80/DGI, issued on April 4, 2013, the Air Force Command approved the *Instruction on Intellectual Property and Innovation applied to the Scientific and Technological Institutions of the COMAER* (BRAZIL, 2013d). The purpose of this normative document, generally named ICA 80-10, is to establish the principles, guidelines and procedures applicable to the appropriation and maintenance of intellectual property and technology transfer by the Air Force institutions. Additionally, after establishing its purposes, objectives and conceptual aspects, in *Nr. 3. Governance the ICA 80-10* sets out the components and the guidelines for intellectual property governance and technology transfer.

It should be stressed also that the above mentioned Air Force PI and Innovation Guideline is supplemented by Ordinance nr. 72/GC6, issued on February 1, 2007, providing on payment of royalties within under jurisdiction of the Air Force Command.

Last, also pursuant to the ENCTI, one of the most important projects of the Brazilian Air Force subsidized by the MCTI is the fifth generation short range air-air A-DARTER missile for Brazilian airspace defense developed jointly with South Africa and assigning priority to total transfer and absorption of developed technologies and qualification of high level personnel. The research on the Unmanned Aerial Vehicle - UAV, must also be mentioned, once this vehicle is an important surveillance tool for defense of the airspace and of large or difficult access regions, besides enabling civilian applications, as public security and transportation (BRASIL, 2012b, p. 64).

5 FINAL CONSIDERATIONS

The recent public policies the subject of the brief analysis presented by this paper, represent a significant advancement for the national defense and security sector and give rise to new challenges for the Brazilian society as a whole. In its impeccable geopolitical analysis Meira Mattos (2011, p. 274) teaches us that “The leading political science experts agree that the States that have in place a power structure containing among other key factors: a large territory with valuable natural resources, high technology and a strong and properly oriented national will be the great powers of the future” (text highlighted by us).

As illustrated by some of the projects developed in each one of the Armed Forces, an interesting aspect mentioned by the ENCTI has to do with the integration of programs and activities of Ministry of Science and Technology and Innovation and of the Ministry of Defense that have been increasing in recent years with coordinated support action directed to priority projects representing important *technological innovations* and which as act drivers of the development of the Industrial Defense Base” (BRASIL, 2012b, p. 64, text highlighted by us).

This model of joint policy design was the path threaded by other leading global powers, which can be evidenced in the following considerations from Medeiros (2007, p. 54):

It has already been broadly documented that along the 20th century to this date, cooperation between public and private institutions have been taking place through interconnected actions of industrial, trade and technological policies (Bairoch, 1993). In the USA, for example, the national budget is an instrument of the technological and industrial policies that generate multiplying effects. The purchase orders submitted to the industrial-military complex, which comprises dual production systems, and the resulting technological innovations that are afterwards taken to the commercial market, are situations through which the North American State seeks, through planned public expenditures, to contribute to generate national wealth.

In sum, through this brief analysis of the subject of interest, it can be concluded that the measures targeting support to innovation, provided for in the MD Intellectual Property Policy and detailed in the PI and the Innovation Guidelines of the Armed Forces, are fully consistent with the fundamental objectives and principles set forth by the 1988 Federal Constitution (CF): national sovereignty (art. 1º, item I and art. 3, item I, of the CF); social interest and economic development (art. 3º, item II and art. 5, XXIX, of the CF) and; scientific and technological development (art. c 5, XXIX and art. 218 and 219, of the CF) (BRAZIL, 1988).

Because of this recent juridical framework - it can be evidenced that, theoretically, favorable institutional conditions now exist to enable the defense sector to drive Brazil towards economic and technological development,

in full compliance with provisions of the END: strengthening of the defense sector should give Brazil “capacity to build its own development model” (BRAZIL, 2012e, p. 43).

As to the gap between what was conceived in writing - through the measures listed by the Federal Constitution and in the above mentioned legal instruments - and the concrete reality evidenced by actual facts, it can be concluded that through judicious planning practical results can be achieved and boosted by assigning appropriate priority to investments in national defense and security. Mere integration of the federal agenda without the critical allocation of resources is to assign a merely formal role to the above mentioned policies.

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