

Editorial



The scientific journal, *Science and Air Power*, from the Colombian Air Force's Postgraduate School, is pleased to present to readers its eleventh volume, which contains articles that provide a detailed description of the original results obtained from research and/or technological development projects. These documents have the following typology: *original scientific articles, reflection articles, revision articles, short articles and case reports*. Each one, in varied subjects, shows the results of the investigative work of its distinguished group of authors, whose dissertations are found throughout the sections of our publication.

The first section, **Operational Security and Aeronautical Logistics**, contains five articles. The first one presents the results of the work carried out by researcher Leonardo Gómez. Center for Aeronautical Sciences Studies of the Colombian Civil Aeronautics developed this effort with the aim of analyzing the current technologies used in navigation services and aeronautical surveillance in Colombia. The article emphasizes *Automatic Dependent Surveillance - Broadcast* (ADS-B) technology. Afterwards, the author, Martín Zorrilla, analyzes the origin of the causes and main factors of *Lankair* experimental aircraft accidents when facing adverse weather conditions in flight. To do so, he uses the US National Transportation Safety Board (NTSB) database as a reference, from January 2005 to December 2014. He identifies, among other causes, disorientation and decision-making as the main reasons for the high accident rate. In these situations, the pilot's ability is undermined. He carried out his work in *Purdue University*, and both his analysis and his results aim to serve as a reference in managing this type of situation in the Colombian Air Force. The following article adopts an analytical approach taken from a computing method used widely in aerodynamics to calculate the aerodynamic coefficient of a wing surface. Its author, Santiago Pinzón, makes a mathematical presentation of the *Vortex Lattice* Method (VLM). He highlights the significance and applicability of this method in the field of aeronautics. His dissertation is based on research carried out at Embry-Riddle Aeronautical University. The next article states that temperature is an essential factor when it comes to performing any given activity. In this sense, the research Group in Aerospace Studies (GIEA/EMAVI in Spanish), made up of writers Néstor Fabián Cedeño Niño, Elías Fernando Acosta Palacios, and Ramiro Alejandro Plazas Rosas, suggest some measures to reduce the temperature level in the cockpits of the T-90 airplane to reach the breakeven point. These measures include adaptation of systems to take in and release air, use of a thermal layer for the cockpit, and the development of a mechanism that allows air circulation during the phase prior to take off. The article that concludes the section shows the general procedure to use the magnetic particle technique that was devel-

oped at the Air Maintenance Command (CAMAN in Spanish). Researchers from the Colombian Air Force's Postgraduate School – Sonia Ruth Rincón Urbina, Daniel Andrés Calvo Cobos, and Erika Juliana Estrada Villa – describe both the essay's principal characteristics and the inspection procedure to be carried out in the CAMAN laboratory. It is important to emphasize that the results of this research were used as a complement for the current processes in the Inspection Procedure Manual, the goal of which is to certify the magnetic particle technique before the aeronautical authority.

The second section, **Management and Strategy**, includes seven articles. The opening article revises the regulations in place regarding the use of drones in Latin America. Besides that, researchers Miguel Gomis Balestreri and Fernando Falck, from the Pontificia Universidad Javeriana, analyze the limits and debates related to the possible use of drones in Latin American urban security policies, mainly by confronting them with surveillance cameras. After this study, researcher Janiel Melamed Visbal, from the Universidad del Norte, analyzes how the strengthening of the Colombian Air Force from the beginning of the new millennium allowed them to carry out important military operations against the Revolutionary Colombian Armed Forces (FARC-EP), which contributed to a reduction in the organization's operative capabilities. The next article is the result of research conducted by the author Mayra Meztizo Sosa, with the HR, ILAC and Justice Group at the Colombian War College. The writer shows the international responsibility Colombia holds in the Inter-American Court of Human Rights regarding the rise in human rights violations, which affects internal justice. Hence, the challenge is to create monitoring and control mechanisms that provide transparency, objectivity, and independence to develop the macro- and micro-processes of the Colombian justice administration. This provides a counterbalance to the lack of procedural dynamics when it comes to clarifying the given circumstances and responsibilities. Within the same research team, author Andrea Carolina Pérez Amórtegui addresses the topic of peace-keeping operations in a post-conflict scene. In her study, she highlights the joint responsibility of societal forces in making possible the conceptions of the legal system before the need of making adjustments to the institutional, local and civilian capabilities, where the armed forces must create conceptual and logistical articulation with non-proved and predictable scenarios, once peaceful coexistence takes effect. Under this same research line, researcher Jairo Rojas gives a judicious review of the annual reports of the International Committee of the Red Cross for Colombia (1998-2010), through which he manages to identify the actions of the committee in relation to the protection of the human rights of members of the Armed Forces of Colombia and their families. As a result of his research, he suggests a proposal for intervention by the ICRC, for the protection of the

dignity of the victims of the armed conflict with the FARC. Afterwards, researcher Diana Isabel Ocampo Rodríguez, a member of the Gravity Center of the Colombian War College, performs a descriptive analysis of the concept of security and transnational crime, focusing on drug trafficking and illegal mining. The results of her research demonstrate the importance of countering threats with the coordination of agents of change (Military Forces) under a framework of cooperation and integration established by the States. Later, author Hermann David González Garzón – as a result of his research with the HR, ILAC, and Justice Group of the Colombian War College – focuses his attention on the impact that the exploitation and illegal market of coltan has on the population and environment of the Department of Guainía, given the violation of the inhabitants' integrity and human rights from the pressure of criminal networks, which operate there in connection with the international traffic of this mineral. In this framework, he proposes the inclusion of a public policy that can reduce the threat to life of the inhabitants of the area and ensure the dignity of workers in the mining sector and their quality of life.

The third section, **Technology and Innovation**, consists of five articles. Firstly, the researcher of the Aerospace Science Group (GICA in Spanish), David Rubio Forero from Los Libertadores University, presents two conceptual designs of wings in order to determine the design with the greatest efficiency for the wing's geometry of an aerodynamic gondola that can be implemented at a recoverable and reusable radiosonde. In the second article, members of the research group on Telemedicine (TIGUM in Spanish) from the Nueva Granada Military University, Leonardo Juan Ramírez López, Andrés Fernando Marín López and Yuli Paola Cifuentes Sanabria, propose applying information and communications technologies to the design of complex systems of transmission, reception, and analysis of biological signals. They developed the architecture of operational and functional biotelemetry to short-range, based on the Arduino® Mega ADK platform, which is useful for the diagnosis and prevention of diseases through the recording and traceability of information from three vital signs, using *Bluetooth* and *ZigBee* technologies. This facilitates the transmission and display of signals in different electronic equipment. Then, the researchers of the Virtual Applications Group (GAV in Spanish) from the Nueva Granada Military University, Diego Felipe Prieto Morales and Fernando Antonio Moreno Forero, see the need for improving comfort in habitable structures, taking into consideration environmental variables such as temperature, humidity, and light intensity, in the search for the implementation of automation techniques to perform activities in people's daily lives. Thus, through home automation, which is used to integrate safety, energy management, and welfare, the authors aim to improve the conditions of accommodation and security in everyday environments of

the urban population, performing remote monitoring via a mobile device with an *Android* operating system. In the fourth article, researchers Silvio Alejandro Jiménez Castellanos and Luis Carlos Rátiva Prieto – members of the research group GIGAD, from Los Libertadores University – develop a physicist-mathematical model applied to the heating process based on a balance of power to determine whether, with the construction of a basic box-type solar kitchen that takes into account annual average weather in Bogotá, D.C., people could do their cooking under the proposed design. In the last article of the section, researchers Paula Andrea Torres Amaya, Kimberly Cano Fajardo, and Olga Lucia Ramos Sandoval, members of the Virtual Applications Group (GAV) from the Nueva Granada Military University, present a prototype of a pulp dehydrator of *Annona Muricata*, taking into account variables of temperature and humidity, with the aim of preserving food for long periods of time, reducing losses, and encouraging consumption and economic development for the producer. The authors emphasize that the food industry is considered one of the economic activities with the greatest involvement in Colombia, hence the importance of this type of innovation.

The fourth section, **Teaching and Education**, presents three articles. In the first article, the researchers Sandra Milena Serrano Mora and Claudia Marcela Marín Rodas from the Research Group on Violence, Health and Society at Santander University, set out to review the components of social competence that children and adolescents in Bucaramanga have in the context of violence and intolerance problems associated with deficit of mechanisms that allow the individual to function effectively, as well as the relationship with their demographic characteristics (age, level of education, socioeconomic status) according to the *Mesy* scale. In the second article, author Ana María Caballero Acevedo from the research group in HR, ILAC and Justice at the Colombian War College, presents an analysis of the regulations that would be applicable to the recruiters of children in the context of the Colombian armed conflict, in light of the dynamics of international and national regulations and trends in this matter, from a specialized documentary review exercise. The researcher's findings include the nature of the crime of recruitment of minors, the growing global demand for the punishment of this crime, and the adoption of rigid regulations in national legislation. These actions open the door to the prosecution of the perpetrators. Finally, the article that closes the section seeks to highlight the importance of teaching citizenship competencies in higher education, which are the responsibility of the Colombian State and the nation's institutions of higher education. In this sense, researchers Sandra Milena Rojas Padilla and Luis Alejandro Padilla Beltrán from the PIREO group at Nueva Granada Military University carry out their research based on the lack of basic standards of citizenship skills for higher education, an

aspect considered by the ICFES (its acronym in Spanish) on the Saber Professional tests (Saber Pro).

We consider the articles that make up the tenth edition of the Science and Air Power Journal to be of invaluable input for all our readers, students, professionals, professors, and researchers, who generate reflections, lectures, and debates through their reading, as well as motivation to incorporate new research contributions in the following editions.

We appreciate the invaluable collaboration of the authors, reflected in the significant contributions that have helped improve the scientific quality of our journal. The appreciation also extends to the team of academic peers who have contributed to the journal with comprehensive reviews, recommendations, and suggestions, making this volume an edition with higher-quality criteria and scientific precision. Additionally, to our prestigious Editorial and Scientific Committee, all of whom accompany us in this praiseworthy work: we give a special welcome to our new members; and we thank, of course, our technical team, who were committed to making possible the delivery of this volume to our community.

The editorial team of the Colombian Air Force's Postgraduate School remains committed to the development of science, technology, and innovation to face the needs both in our home country and abroad. In this regard, we seek the active participation of the national and international communities in the investigative processes and scientific mobility in order to generate greater visibility and impact, as well as to implement spaces that allow for the creation of academic networks. This challenge goes hand in hand with the project of including our publication in the Bibliographic Databases with Scientific Selection Committee (BBCS in Spanish), as well as in other bibliographic indexes, to work toward the internationalization of our journal.

The aforementioned challenges represent some of the obstacles that we must overcome in the coming years (2016 - 2018). These goals continue to lead to the path of quality and scientific precision, to accomplish our aim to maintain a tradition of excellence in the publishing process, as well as recognition and visibility in the academic and scientific spheres at each of our publishing lines and in military and aerospace sectors, both on a national and an international level. We invite you to subscribe on our website, www.publicacionesfac.com, which is an important part of this project.

Captain Germán Wedge Rodríguez Pirateque
Director, Science and Air Power Journal

Mayden Yolima Solano Jiménez
Editor