

# Editorial

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Sixty years are not celebrated every day, especially considering that in almost more than half a century societies tend to create and undergo various structural changes that transform their perspectives about reality. An example of this is the internal armed conflict, which has marked Colombian history and steered the recent post-agreement period toward an era of concord and a spirit of compromise.

In such circumstances, which call for reinterpreting the past and building a future under the aegis of peace, the role played by the Colombian Air Force (FAC) over one hundred years is more than remarkable. However, the goals accomplished and the everlasting support that this institution has provided to Colombian people with dedication and a strong vocation, would not have been possible without the full development and constant improvement in the quality of postgraduate education and training. This educational mission is bestowed from the classrooms and research centers that make part of the Postgraduate School of the Colombian Air Force (EPFAC, in Spanish), an academy that allows national security to be exercised from the air and to remain humanely close to the needs of Colombian population.

The EPFAC has been built as a higher education institution due to its long history of impeccable military training and disciplined postgraduate education within the aeronautical field. Such characteristics allow EPFAC to positively impact all the developments, ventures, and innovations currently taking place in the air and space sectors of our country, as well as clearly depict high quality standards through its scientific publications, among them, the current issue of *Ciencia y Poder Aéreo* journal, now available to all our readers.

This rewarding enterprise is presented by EPFAC through the first issue of this scientific journal for the current year, which is raised as an honorable creation containing various unpublished scientific articles that systematically describe the original results from research or technological development projects and profound reflection and review procedures. These manuscripts are incorporated in each of the sections described below.

**Operational Safety and Aviation Logistics** section includes three research papers. The first of these, prepared by Luis Alberto Saavedra Martínez, presents some guidelines for “Strengthening the Aeromedical Certification Process of the Colombian Air Force.” This work provides alternatives to increase the objectivity of decisions towards certification processes, taking as a starting point the proposal to stratify certification standards according to the equipment being operated and the responsibility held on the aircraft, thus strengthening aeromedical procedures decision-making.

The reflections made by Edgar Leonardo Gómez Gómez, Julio Enoc Parra, and Julieta Vélez in the paper “Supporting the Investigation of Aircraft Accidents using RPAS” constitute an initial theoretical analysis to define a standardized procedure for collecting information at the scene of a plane crash by means of Remotely Piloted Aircraft Systems (RPAS). The foregoing is the starting point for the construction of the manual for aircraft accident investigation. This work presents an analysis of the types of RPAS that can be used for this task, as well as the procedures for using this equipment and the type of information retrieved by RPAS.

The work closing this section, titled “Neuropsychological Training Tool for Scan-Eagle Unmanned Aerial Vehicles Operators,” written by Gerson Adolfo Páez López, María Alejandra Corzo Zamora, Alexander Díaz Ariza, and Nohora Inés Rodríguez Guerrero, MA in Operational Safety at EPFAC, introduces an autonomous neurocognitive training tool for remote manned aircraft (RMA) operators at the Colombian Air Force. This tool is aimed at improving the skills and enhancing the intuitive automatic thinking of RMA operators with less cognitive load as an additional alternative to complement the training received by these professionals.

**Management and Strategy** section comprises three research works and is headed by a paper written by Luis Antonio Marín Moreno, titled “Operational Law and the Culture of Peace in a Military Institution.” The purpose of this article is to address the debate around International Humanitarian Law (IHL) and its importance in the new contexts of application of legally constituted forces, due to the rapid mutability of threats to national security.

The second work in this section, signed by David González-Cuenca and Douglas Eduardo Molina-Orjuela Orjuela, approaches the “Supremacy in South American Air Security and Defense Policies.” In their work, authors provide insights on the use of air force power in Colombia before the challenges of multidimensional security. For this purpose, documentary review and analysis was applied as methodology, allowing the researchers to carry out a comparative examination of the theoretical, conceptual, and practical elements of air force power with a particular focus on air supremacy.

The next contribution addresses the “Military Intelligence as a Key Player in the Consolidation of Peace Scenarios.” In this work, Abdón Estibenson Uribe Taborda and Leonardo de Jesús Mesa Palacio expose some future perspectives for the military forces based on the experiences of other countries that have experienced conflict and post-conflict periods. The authors also present an overview of the possible scenarios for Colombia in the post-conflict era and the capabilities that military intelligence must uphold or acquire in order to face them.

In the third section, named **Technology and Innovation**, researchers Germán Wedge Rodríguez Pirateque, Nelson Arzola De La Peña, and Ernesto David Cortés García present the study “Sustainable Design of a Nanosatellite Structure Type CubeSat as a Modular Platform for Tests,” which describes the development and application of a sustainable design process in a small-scale modular platform under the CubeSat standard. The authors highlight the use of these modular structures as a means for the development of laboratory tests and experiments with different operating conditions such as those real satellites experience in orbit.

Continuing, Juan Sebastián Solís Chaves, Jeison Ferney Barrios Rojas, Nelson Arturo Jiménez Acuña, César Geovany Quiroga Vargas, and Ángela Paola Sánchez Alba report the results of the research study Design and Deployment of a Mechanical Control with Push-Pull Cables in a Ground Workbench for PT6 Engines. The analysis was performed on a test bench for on-ground operation of turboprop engines fed with a mix of fossil fuel (JET-A1) and biofuel (biodiesel). By

means of an empirical-analytical methodology, the researchers carried out functional trials through the operation of levers and mechanical control cables in order to test biofuel mixes on all engine operating parameters (from minimum to maximum revolutions per minute [RPM]), with the aim of verifying parameters such as fuel flow, temperature, torque, and mechanical integrity of the engine components. This study allowed obtaining accurate information on the behavior of the engine when powered by biofuels.

The article “Theoretical Review and Application of Space Science to Reduce Fuel Consumption of Rockets and Space Vehicles,” written by Guillermo Alberto Poveda Zamora, validates the advantage of the natural position of the equator on planet Earth for the launching of space vehicles and rockets through theoretical mathematical reflections. This information will allow readers to dig into space science in a simple way, since they will find concepts and contextual analyzes that, with the support of diagrams and figures, allow a proper understanding of the subject. Therefore, we especially recommend this article for promoting spatial knowledge that, in words of the author, is a “dynamic source of research in a field that has been little studied until now, but that counts on immense possibilities for exploration and multiple perspectives for the benefit of society.”

Closing this current issue, the section **Education and ICT** introduces the research work by Professor María del Pilar García-Chitiva, who discusses the issue of “Virtual Mediation in Teaching and Training:

Advances and Challenges.” Based on a bibliometric study, the author establishes the scope of available studies on the inclusion of virtual measurements in air traffic control teaching and training. The aim of this research is to identify the background of this field of knowledge in order to develop an ICT-mediated instruction, training, and evaluation model for air traffic controllers.

From the information provided on the articles that make up the 15th edition of *Ciencia y Poder Aéreo* journal, it is reasonable to consider this publication as an indisputable input for students and university professors, researchers, and professionals in the military aeronautical field. These contents promote a thoughtful reading and the endless task of generating knowledge on the subjects developed in each work, contributing to the debates and perspectives hereby presented.

We cannot say goodbye without acknowledging the support of the authors, who raise the bar for the scientific rigor of the Journal through their contributions. We also recognize our team of academic peer-reviewers, who, with their valuable appraisals, recommendations, and suggestions, made this a publication with a high level of quality, in accordance with the new requirements of national and international indexing and abstracting systems. Likewise, we welcome and appreciate the priceless work of our Editorial and Scientific Committees.

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