Chapter 3
Aviation Cybersecurity:
Shielding Against Cyberthreats in the Air

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ABSTRACT

Cybersecurity is a set of applications specialized for information and communication technology systems. Cybersecurity practices are conducted in cyberspace, and should be conducted both under the limitations and with the opportunities of this complex environment. Dynamic, totalistic, and adaptive approaches are required for cybersecurity; solely technical or financial measures would not be enough to ensure cybersecurity. Instead, a more holistic view that considers all aspects of cybersecurity would be more appropriate. In the aviation sector, where technical aspects are dominant and sensitivities are exceptionally high, it can be directly noticed that the associated complexities are heightened even further. This results in a requirement for a more concrete and detailed understanding and approach for cybersecurity in aviation. In this chapter, cybersecurity approaches and applications in aviation sector will be discussed extensively.

1. INTRODUCTION

Cybersecurity can be defined as the specific set of applications focused on and specialized for information and communication technology systems, units, products and services. It is an interdisciplinary field based on many areas including computer science, law, psychology, management, transportation, and banking and finance. The cybersecurity paradigm, emerging from sociological, psychological and technical sources, can be embraced as a security-based perspective within the realm of information management.

Cybersecurity applications are conducted in cyberspace, which is defined as "a global domain within the information environment consisting of the interdependent network of information systems infrastructures including the Internet, telecommunications networks, computer systems, and embedded processors and controllers" (NIST, 2021) and it should be carried out both under the constraints and with the advantages of this complex environment. Therefore, with the increase in number of cyberattacks, cybersecurity applications require dynamic and adaptive approaches to overcome these complexities. On the other hand, this situation brings about the fact that cybersecurity cannot be guaranteed through solely technical or financial measures. Instead, a more totalistic approach that addresses all aspects of cybersecurity is considered appropriate.

In the aviation sector, where technical aspects dominate and concerns related to human life encompass both civil and military aspects, alongside the heightened sensitivities involved, it becomes evident that the associated complexities are even higher. This results a requirement for a more concrete and detailed understanding and approach for cybersecurity in aviation. In this chapter, cybersecurity approaches and applications in aviation area will be discussed extensively.

2. MAIN FOCUS OF THE CHAPTER

2.1 Cybersecurity and Cyberspace

The specific and specialized set of applications and implementations performed in order to ensure the security of systems, data, information,

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