



Workshop Summary

First Meeting on Cybersecurity in Air Navigation Services

(Online, from August 31 to September 2, 2022)

1. Introduction

1.1 The first meeting on cybersecurity in air navigation services was held from August 31 to September 2, 2022, using the zoom platform, attended by representatives of the Authorities and air navigation service providers of the South American region; as well as representatives of international organizations including CANSO, EUROCONTROL, and COCESNA. The participant register is attached to this summary.

1.2 Mr. Fabio Rabbani, Regional Director of the SAM office, opened the event. The Regional Air Traffic Services Officer, Mr. Roberto Sosa, was in the Secretariat, accompanied by Officers Pablo Lampariello, Francisco Almeida, and Leonardo Boszczowski.

2. Background

2.1 The first cybersecurity meeting in air navigation services was held as part of the ICAO SAM Office program in support of the region States for the implementation of a cybersecurity strategy in civil aviation in response to Resolution A40-10 — Ways to address cybersecurity in civil aviation, encouraging States to implement a Cybersecurity Strategy, underlining the importance of developing a sustainable plan to implement it, as well as continuing to work on the formulation of a strong cybersecurity framework.

2.2 The following objectives were defined for the meeting:

- a) Improve the participants' knowledge about the importance of cybersecurity in air navigation services.
- b) Familiarize the participants with the ICAO safety strategy.
- c) Familiarize the participants with the ICAO Safety Action Plan.
- d) Promote cooperation between all stakeholders regarding cybersecurity in air navigation services

3. Development

3.1 The workshop agenda was divided into three sections to achieve the meeting objectives: Presentation from ICAO, Industry, and States.

3.2 ICAO Cybersecurity Officer, Mr. Rashad Karky, presented the progress in the implementation of cybersecurity in aviation, which included a summary of the development related to cybersecurity in ICAO, including the legal and regulatory aspects associated with this matter.

3.3 It emphasized the importance of establishing a cybersecurity culture in the organizations; for this purpose, ICAO has facilitated the cybersecurity culture document as a framework for States and the industry.

3.4 The importance of developing a cybersecurity policy as a fundamental element of a cybersecurity strategy was highlighted during the presentation. For this matter, ICAO has developed the document for the Cybersecurity Policy as guidance for States and the industry.

3.5 During Mr. Karaky's presentation, it was emphasized that implementing a cybersecurity strategy could require organizational changes; even ICAO has updated its structure to address this implementation.

3.6 As part of the elements related to cybersecurity, the progress made in the "Aviation Trust Framework" was presented as an element that will support the air navigation system, making it safer and more robust.

3.7 In conclusion, Mr. Karaky addressed the importance of training and education as a fundamental element for establishing a solid cybersecurity strategy, for which ICAO has developed several training programs. The information is available on the organization's website.

3.8 During the meeting, an online survey was carried out among the attendees regarding the awareness and access to the cybersecurity documents developed by ICAO, specifically the Cybersecurity Strategy and the Cybersecurity Plan. Only 44% of the meeting attendees were aware of the strategy, and 29% of the ICAO Cybersecurity Plan, showing that it is necessary to improve the provision of the documents. Considering the above, the documents have been made available to attendees on the meeting website.

3.9 Mr. Pablo Lampariello and Mr. Leonardo Boszczowski from SAM Office addressed the matters related to aviation security and cybersecurity, including the Annex 17 Requirements and Recommended Practices and the USAP protocol questions directly related to the aspects of cybersecurity.

3.10 One of the aspects emphasized in the presentation is the need for collaboration among all authorities and stakeholders, including aviation security and safety authorities and service providers.

3.11 In the agenda section related to the industry, there were presentations made by EUROCONTROL, CANSO, and COCESNA.

3.12 EUROCONTROL showed the work carried out by this organization to support its associated States on cybersecurity issues, including cybersecurity assessments, the aviation cybersecurity report, training programs, and other elements supporting the civil aviation of the EUROCONTROL Member States.

3.13 Among the essential aspects highlighted by EUROCONTROL was the education and training of all air navigation services personnel; for this matter, the organization has developed some specific training programs available on the EUROCONTROL website.

3.14 CANSO presented the developments achieved regarding cybersecurity, highlighting the Standard of Excellence for cybersecurity and the Guide for Developing a Cybersecurity Policy in service providers; both documents have been made available on the meeting website.

3.15 The CANSO presentation highlighted the importance of establishing an adequate cybersecurity policy at the service provision level.

3.16 COCESNA presented the progress made to strengthen the safety and security of the air navigation system in the Central American region through the implementation of a cybersecurity strategy

3.17 Among the fundamental aspects of COCESNA's cybersecurity strategy it was highlighted the training and education, which have been an essential part of the policy established by this organization to address the issue of cybersecurity in air navigation; likewise, the networks segregation used for air navigation services and the purging of obsolete assets, among other actions that have been implemented as part the cybersecurity program.

3.18 Venezuela shared the progress achieved in developing the cybersecurity program, highlighting the identification of responsibilities, and developing the regulatory framework, including information circulars, inspection procedures, and other documents.

3.19 As part of the actions presented by Venezuela, the training of inspectors and specialists involved in cybersecurity was highlighted as an essential element of the program.

3.20 Among the lessons learned shared by Venezuela, it was the importance of identifying the ANS critical assets, which is an activity that requires considerable time, for which it is necessary to plan this task properly.

3.21 Chile presented its progress in cybersecurity, emphasizing the importance of establishing adequate governance at the authority level; the risk analysis of the assets that form part of the air navigation service provider's network, considering confidentiality, integrity, and availability as fundamental pillars.

3.22 The integration of the different management systems, establishing a regulatory framework, and creating a multidisciplinary team with adequate governance were essential elements of the cybersecurity strategy implemented by Chile.

3.23 Brazil presented the progress in establishing cybersecurity actions in support of air navigation services, highlighting the importance of education and training for which they have developed a dedicated program for this purpose.

3.24 The establishment of performance indicators that support decision-making related to cybersecurity matters was part of the experience shared by Brazil during the presentation.

3.25 All presentations and the videos were uploaded to the event page at the following address: <https://www.icao.int/SAM/Pages/MeetingsDocumentation.aspx?m=2022-CIBER>

4. Conclusions

The following conclusions were discussed with the attendees as part of the issues addressed during the meeting:

4.1 Establishing a regulatory or guiding framework for establishing the cybersecurity strategy at the State level is essential; for this development, the Authority can rely on the documents developed by ICAO or other organizations.

4.2 It is essential to establish a cybersecurity policy with a State scope that includes service providers and operators. The Policy Guide document developed by the ICAO could support States and service providers for this purpose.

4.3 It is necessary to improve the dissemination of the ICAO cybersecurity documents. The office will make them available on the meeting website and will work with the SAM States and providers to raise awareness.

4.4 The States, including the Authority and service providers, must implement a process to identify critical air navigation assets. This task is a fundamental pillar in the cybersecurity process in air navigation services; likewise, they must work on adequate segregation of air navigation services networks as part of the strategy.

4.5 It is essential to establish a work team at the State level involving Authority and service providers, including aviation security, safety, and IT stakeholders, with the proper governance and processes.

4.6 ICAO and the States must promote cybersecurity education depending on the functions and responsibilities of the personnel. Reviewing the training programs and plans for technical personnel at all levels is recommended. The office will coordinate with the States to carry out this task.

4.7 It is essential to consider integrating the different management systems, including QMS, SMS, and Cybersecurity, to achieve an efficient and sustainable system in civil aviation.

List of participants

1. (ARG) Andres Espina
2. (ARG) Ariel Cammalleri - EANA
3. (ARG) Diego Frigerio - ANAC
4. (ARG) Guillermo Luis Castro - ANAC
5. (ARG) Hernán Parada
6. (ARG) Javier Dovichi
7. (ARG) Leonardo Maiale
8. (ARG) Mariana Luna - ANAC
9. (ARG) Marisa Bertani - ANAC
10. (ARG) Moira Callegare - ANAC
11. (ARG) Ramiro Ponce - ANAC
12. (BOL) Daniel Alejandro Vargas Pierola
13. (BOL) Darwin Loza
14. (BOL) Jaime Yuri Alvarez
15. (BOL) Jose Acarapi
16. (BOL) José H. Lopez Rojas - NAABOL
17. (BOL) Juan Jose Calero - NAABOL
18. (BOL) Luis Carlos Orellana
19. (BOL) Wilfredo Callisaya
20. (BOL) Willy Ramos
21. (BOL) Yesid Arze Pinto
22. (BRA)Marcelo Cirelle - DECEA
23. (BRA) Artur Nunes - DECEA
24. (BRA) Marco Sernagiotto - DECEA
25. (BRA) Menotti Machado - ANAC
26. (CANSO) Javier Vanegas
27. (CHI) Alejandro Ruiz
28. (CHI) Héctor Ibarra
29. (CHI) Jorge Poblete
30. (CHI) José Allende
31. (CHI) Jose Ravanal Serón
32. (CHI) Juan Carlos Gutiérrez Riquelme
33. (CHI) Luis Mella
34. (CHI) Rodrigo Tejeda
35. (CHL) Francisco Uzieda
36. (CHL) Pablo Valenzuela
37. (COCESNA) Denis Sánchez Ardón
38. (COCESNA) Ernest Arzu
39. (COCESNA) Gabriel Quirós Pereira
40. (COCESNA) Karim Alvarez
41. (COL) Andres Ruiz

42. (COL) Jhon Sabogal
43. (COL) Oscar García
44. (COL) Ruben Montealegre Beltran
45. (COL) Teddy Dennis
46. (COL) Wilbert de Jesús Hernández Rodríguez
47. (ECU) Bernardo Oñate
48. (ECU) César Rodas Mancheno
49. (ECU) Darwin Ipiales
50. (ECU) Darwin Suarez
51. (ECU) David Burgos
52. (ECU) Diego León Soria
53. (ECU) Eduardo Leiva
54. (ECU) Edwin Piedra
55. (ECU) Eugenio Espinoza
56. (ECU) Fabricio Gavilanes Carreño
57. (ECU) John Espinoza
58. (ECU) Johnny Francisco Morocho Tinoco
59. (ECU) Jorge Zúñiga
60. (ECU) Juan Francisco Soto
61. (ECU) Lenin Maldonado
62. (ECU) Mauricio Velástegui
63. (ECU) Miguel Miranda
64. (ECU) Miguel Olmedo
65. (ECU) Rosaura Reyes
66. (EUROCONTROL) Patrick MANA
67. (GUY) Adrian Bassier
68. (GUY) Anthony Thom
69. (GUY) David Low
70. (GUY) Karen Liverpool
71. (GUY) Noel Goodman
72. (PAN) Carlos Aparicio P.
73. (PAN) Daniel De Avila
74. (PAN) Ivette M. Iturrado
75. (PAN) Juan Pablo Zelayandia Mojica
76. (PAN) Sergio Rodriguez
77. (PAN) William Santamaria
78. (PAN) Xenia Gabriela Guardia
79. (PAR) Alma María Recalde de Caballero
80. (PAR) Edilberto Astorga
81. (PAR) Juan Duarte
82. (PAR) Liliana Mendoza
83. (PAR) Luz Ferreira
84. (PAR) Sergio Bogado
85. (PAR) Victor Moran

86. (PER) Christian Huertas - DGAC
87. (PER) Edward La Serna
88. (PER) Giuliano Guzmán
89. (PER) Harry Frank Montellanos Cabrera - UNMSM
90. (PER) José-Luis Paredes - CORPAC
91. (PER) Luis Enrique Luna Calderon
92. (PER) Mariela Ingrid Rodriguez Gutiérrez - CORPAC
93. (PER) Patricia Indacochea
94. (PER) Rocio Avila - CORPAC
95. (SUR) Cosmo Wong
96. (SUR) Marylane Tsen You
97. (SUR) Rachel Simson
98. (URU) Adriana San-Germán
99. (URU) Álvaro Iparraguirre
100. (URU) César Vecino
101. (URU) Daniel Burgos
102. (URU) Henry Diaz
103. (URU) Marcos Vignolo
104. (URU) Mario Dávila
105. (URU) Monica Rodríguez Torena
106. (URU) Nancy Escobar
107. (URU) Patricia Pereyra
108. (URU) Sergio Gómez
109. (VEN) Anais Rodríguez
110. (VEN) Aurora Romero
111. (VEN) Ivana Acosta
112. (VEN) Jarumy Castillo
113. (VEN) Kryoto Díaz
114. (VEN) Sabrina Rodríguez
115. (ICAO) Roberto Sosa
116. (ICAO) Pablo Lampariello
117. (ICAO) Francisco Almeida da Silva
118. (ICAO) Leonardo Boszczowski