INTERNATIONAL FEDERATION OF AIR TRAFFIC CONTROLLERS' ASSOCIATIONS

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Report of the Joint Cognitive Human Machine System Group (JCHMS)

Presented by
JCHMS

SUMMARY

The future influence of new technologies such as Machine Learning and Artificial Intelligence will pose new challenges to the working environment in Air Traffic Control.

Under the umbrella of IFATCA, a group of motivated people has started to discuss and do research on these challenges. This group has produced several conference papers and has finalised draft guidance material. The aim being that this guidance material (GM) will serve the Federation in the future to assist in educating its membership and contribute to the regulation, certification, and ongoing research initiatives. The GM has been discussed at the 4th digitalisation conference in March 2024. This paper should be a major contribution to the discussion on the future of technology.

1.   Introduction

 1.1.   A group of dedicated professionals has started to tackle this important subject since over a year.

 1.2.   Composed of Ms Nora Berzina (MUAC ATCO, EGATS), Dr. Anthony Smoker (EASA representative IFATCA, GATCO UK), Dr. Stathis Malakis (SESAR representative ATCO, Greece), Mr. Andrea Poti (EASA representative IFATCA, Italy), Mr. Tom Laursen (former EVP Europe, Denmark), Dalibor Jovanovic (ATCO, Slovenia), Gabriele Fabris (ATCO, Italy) and Sergio Velotto (Italy) have met 48 times since the start of the group. Mr. Marc Baumgartner (SESAR/EASA Coordinator, Switzerland) has acted as coordinator of the group. Dr. Marcello Scala has resigned from the group.

 1.3.   Working paper 165 for Jamaica Conference 23 informed Directors that guidance material will be created. Andrea Poti, a member of the group, presented the paper.

 1.4.   The guidance material was presented at Conference 24 in Singapore as information paper.

 1.5.   The 4th Digitalisation Conference, took place on the 22.3.2024 in Geneva.

1.6.   Further scientific publications are currently being prepared.

1.7.   This report includes links to websites

2.   Discussion

2.1.   The JCHMS has met over 48 times since its inception. The aim being that we produce guidance material for IFATCA and the Member Associations to educate, inform and debate on the future of our profession with the advent of new technology.

2.2.   On the 22nd of March the 4th Digitalisation Conference took place in Geneva with the objective to debate the Guidance Material proposed.

2.3.   60 invited participants from Academia, ANSPs, Regulators, PSOs, SESAR, EASA and Eurocae discussed the Guidance Material IFATCA has elaborated and paid particular attention to the need to carefully engineer the transition towards new technology into the current existing ATM system.

2.4.   The outcome of the conference can be viewed under the IFATCA website dedicated to digitalization.

2.5.   With the advent of new technology, in particular Artificial Intelligence and Machine Learning, Air Traffic Management and in particular Air Traffic Control work might change fundamentally. IFATCA, as the global technical and professional voice of Air Traffic Controllers, needs to be able to influence the current Research and Innovation work in this domain with professional inputs.

2.6.   The guidance material will provide such information for the member associations, the regulators and the Air Navigation Service providers across the globe.

2.7.   The JCHMS is aware that PLC is reviewing the current policy related to new technology. It therefore refrains from making policy proposals at this stage. It is, however, important in the view of the JCHMS group that all the IFATCA officers and representative can provide a robust position of IFATCA on the advent of new technology. Therefore, we attach to this paper a list of points which summarize the content of the GM. This list should be used widely.

3.   Conclusion

3.1.   The published version of the Guidance Material can be viewed under the following link.

3.2.   Further work will take place in form of research publication, educational sessions for member associations and exchange with regulators and ANSP.

3.3.   The attached list of points is summarizing the content of the Guidance Material and should be used by IFATCA representative worldwide when participating to the debate on advent of new technology in ATM.

(Policy) Statement on Joint Cognitive Human Machine System (JCHMS)**

Objective :To ensure the safe and efficient integration of advanced technologies, including Artificial Intelligence (AI) and Machine Learning (ML), into Air Traffic Management (ATM) systems while maintaining the central role of human operators.

1. Integration and Safety
   - All new technologies must be integrated into existing ATM systems in a manner that does not disrupt current operations.
   - Safety standards must be rigorously maintained, with new technologies undergoing thorough testing and certification processes.

2. Who is in control
   - A discussion during design and integration needs to be carried out by all stakeholders involved to discuss who is in control. AI, ML or the ATCO.

3. Human-Machine Collaboration
   - Emphasize the importance of seamless interaction between human operators and automated systems.
   - Ensure that human operators remain integral to decision-making processes, leveraging technology to enhance their capabilities.

4. Training and Adaptation
   - Provide comprehensive training programs for air traffic controllers to adapt to new systems and technologies.
   - Encourage continuous learning and skill development to keep pace with technological advancements.

5. Regulation and Certification
   - Develop and implement appropriate regulations and certification processes for new technologies.
   - Collaborate with international bodies to establish global standards for the integration of AI and ML in ATM systems.

6. Research and Development
   - Support ongoing research and development efforts to optimize the design and integration of new technologies.
   - Foster a culture of innovation while ensuring that safety and efficiency remain paramount.

Future Directions
   - Promote ongoing dialogue and research to address emerging challenges and opportunities in the field of air traffic control.
   - Ensure that human operators continue to play a central role in ATM systems, even as automation advances.