



WORKING PAPER

COUNCIL — SPECIAL MODEL SESSION

Subject No. XX: Proposed actions relating to the projected shortages of skilled aviation personnel

(Presented by Norway)

EXECUTIVE SUMMARY

The Council is requested to raise awareness and enhance consciousness towards the importance of developing and adjusting to the use of new training methods and new teaching technologies. The expectation is that new training methods and new teaching technologies such as e-learning and multimedia-based learning would attract young people and the next generation to consider a career in the civil aviation.

Action: The Council is invited to request the Secretariat to:

- a) Look into the matter of new training methods and new teaching technologies. Furthermore to examine the SARPS in this field to clarify if it is necessary to make amendments regarding the implementing of new training methods and new teaching technologies.
- b) Collect information and best practices from Member States and the industry's stakeholders.
- c) Enhance consciousness among industry stakeholders towards using and adjusting to new training methods and new teaching technologies.
- d) Organize a symposium where new training methods and teaching technologies are discussed.

Financial implications:

It is expected that the introduction of new training methods and new teaching technologies may result in a significant positive economic impact for the industry. For some organizations, there might be additional costs for some shorter period caused by the implementing of new training methods and new teaching technologies. These costs are however more likely to be single one-time costs than repeated costs.

References:

EASA. NPA 2014/22 New training methods or new teaching technologies.

1. INTRODUCTION

1.1 This working paper discusses learning methods relevant for the next generation of aviation (NGAP). During recent years, the evolution of aviation technologies has been accompanied by the development of new training methods and new teaching technologies. Aviation training and education will have to adapt accordingly, and develop and facilitate the learning process further by continuous focus on new training methods and new teaching technologies such as e-learning and multimedia-based training.

2. BACKGROUND

2.1 The development of electronic engineering, computers and the Internet has considerably changed the way of understanding the design of new aircraft types, its tools, components and learning. The NGAP are millennials, and many of them are very familiar with using new training technologies during education.

The European Aviation Safety Agency (EASA) put focus on these issues in their recent Notice of Proposed Amendment (NPA), where the Agency discusses safety, economic and social issues related to the introduction of new training methods and new teaching technologies. The proposed changes in the existing set of rules are expected to fulfil what industry needs for efficient and cost-effective training of maintenance certifying staff, while maintaining or increasing the level of safety.

3. CONSIDERATION OF ISSUES

3.1 *Multimedia-based training and e-learning could be useful for how the NGAP will learn and maintain knowledge in the future.*

Competence based learning:

If we consider we have three levels of training and competence; Level 1 is basic training, level 2 is current training on how to use and understand aircraft types, its components and tools, and level 3 is specialized training.

Multimedia-based training and e-learning may be used to satisfy the theoretical training element either in the classroom or in the virtual controlled environment. For example, e-learning could be used to maintain or achieve basic training and further training. By using e-learning in a differential way, the students and others who are in a learning process could use their background, experiences and preferences on how to understand and obtain the theoretical material. For example the e-learning-program could include question-fields, which also could contain obstacles to prevent one from going further in the program if the answer is incorrect. Instead, the e-learning-system would automatically adjust to one's competence level. It could

bring the student to the level he or she appears to be at, before the material is yet presented in another educational matter. In this way the learning method is more adjusted to each student's background training and level of understanding.

It is important to emphasize that e-learning would function best to achieve or maintain basic training and recurrent training. If the main goal is specialized training amongst aviation professionals, an adapted education combining both traditional lecture, new technologies and human factors should be considered.

3.2 *Multimedia-based training and e-learning would impact aviation training and education providers. This could attract and retain the NGAP to the different disciplines of aviation.*

It is recognized that the new generation of more computer-minded maintenance staff finds new teaching/training methods based on digital technology more appealing. It could be said that the more interactive and different teaching and training methods being used, the easier it would be to get the student's attention and vigilance. This could result in a more effective and efficient training course.

The aviator labour market today includes a whole group of a new generation of aviation professionals. Young people are more attracted by e-learning than attending the traditional academic courses. Direct interaction between aircraft and student becomes more and more part of the learning processes and should lead to different and more attractive methods.

If you mix the teaching methods, it might improve the efficiency of the training. Therefore, there should be a positive social impact as the courses would become more attractive to the students, raising their motivation, engagement and learning abilities.

We need to bear in mind that all experience and practical training cannot be replaced by computers and virtual devices. New training methods and new teaching technologies such as virtual reality have an effective way of creating a reality that cannot be demonstrated in real life. For example training on how to handle aircraft emergencies or other distress situations. The students need to obtain and maintain rational attitudes towards safety. These attitudes cannot be achieved by e-training by itself, but by human factors.

The instructors could not be replaced by new training methods and new teaching technologies, certain human factors are inevitable. But the teachers and aviation instructors would have to adapt to new teaching technologies and training methods, to cope with the modern technology development.

4. **FINANCIAL IMPLICATIONS**

4.1 Introducing new training methods and new teaching technologies may result in a significant positive economic impact for industry. For example by reducing hours spent on teaching in the classroom environment, by blending the classical teaching methods with distance learning, e-learning or web-based training. The time needed for aircraft visits as part of practical training may also be reduced resulting in additional cost savings.

Still, it is important to keep in mind that the new teaching technologies and new training methods may cause additional costs to for example the national aviation authorities. They would need to adapt their procedures, train the existing staff on new competences required for the approval of the training courses, equipment and software.

The costs involved are however more likely to be single one-time costs than repeated costs.

5. ACTION

5.1 The ICAO Council requests the Secretariat to look into the matter of new training methods and teaching technologies, thereby to examine the SARPS in this field in the existing annexes. The purpose of the examination of the annexes should be to clarify if it is necessary to make amendments in order to take sufficiently into account the importance of implementing new teaching technologies and new training methods.

The Secretariat should issue a State Letter and collect information and best practices from Member States. It might be considered that in some Member States, the process with implementing new teaching technologies and new training methods have been developed further than in other Member States.

Pursuant to the above mentioned suggestion, the Secretariat should also collect information with regard to industry stakeholder's expectations and experiences with new training methods and new teaching technologies. This initiative would be a contribution to enhance consciousness among industry stakeholders towards using and adjusting to new training methods and new teaching technologies.

A study group with representatives from Member States supported by the Secretariat should be established, where new training methods and new teaching technologies would be discussed and evaluated. A symposium should be organized in order to debate the issues to their full extent and ensure the broad involvement of all stakeholders.

As a result of the exercise above, the Council asks the Secretariat to report back, if a process leading to amendment of SARPs is deemed necessary.

6. CONCLUSION

6.1 The Council is requested to endorse this Working Paper and approve the action list described in the paragraph 5.1.