Ensuring the Quality of Training when Instruction Is Delivered Via Virtual Classroom

Guidance Material

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IATA

Contents

Definitions

Classroom training: Refers to a traditional training approach where learning takes place in a physical classroom setting. It involves an instructor delivering content to a group of trainees in a face-to-face environment.

Computer-based training (CBT): Refers to a form of training that utilizes computer technology and digital resources for delivering educational content.

Courseware: All instructional material a learner requires to complete a curriculum, in whatever media required, including manuals, visual aids, lesson plans, flight event descriptions, computer software programs, audiovisual programs, workbooks, handouts, etc.

Distance Learning: A term used to refer to courses that are studied without the need to be physically present in a classroom, at the school, etc.

E-learning: The use of computer, internet, web-based and mobile technologies to deliver learning solutions. May be designed for self-study or instructor-led training.

Virtual classroom: A digital learning environment that allows instructors and students to connect online with real time interaction and communication.

Acronyms

AC: Advisory Circular

AOC: Operator holding an Air Operator Certificate

ATO: Approved Training Organization

EASA: European Union Aviation Safety Agency

FAA: Federal Aviation Administration

ICAO: International Civil Aviation Organization

LOs: Learning objectives

NCA: National Competent Authorities (EASA)

Q&A: Questions and Answers

VC: Virtual classroom

Acknowledgement

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Chapter 1 - Context and purpose

With advances in technology and the changing learning styles of the younger generations, the design and delivery of training programs in the aviation is evolving and distance learning is expanding.

Distance learning brings new opportunities to enhance the learning experience of the trainees when compared to traditional classroom training, e.g.:

- flexibility to attend training regardless of location
- enhanced learning effectiveness and optimized learning process by allowing the trainees to create the learning experience that works best for them based on their learning style, whether they are visual or auditor learners
- increased participation and engagement, as interactive modules, simulations and games, facilitated by the digital tools can contribute to a higher level of engagement from the trainees
- easy and repeated access to training materials
- opportunity to revisit recorded sessions and pre-recorded videos
- ability to replicate real life events within a safe training environment

In the aviation training domain, classroom instruction remains the traditional means to deliver academic, theoretical and operational knowledge for both licensing training and operator training. It is part of the regulatory requirement for personnel training in most of the aviation disciplines, even though some regulations recognize Virtual Classroom (VC) instruction by means of videoconferencing, in real time, as a means of compliance to the amount of time spent in an actual classroom.

The advent of the COVID crisis opened the door to increased regulatory acceptance of distance and virtual learning. In August 2020, in the middle of the COVID crisis, EASA published guidance for allowing virtual classroom instruction and distance learning, and encouraging training organizations to shift to more distance learning (remote/virtual environments), and for the authorities to facilitate this approach to training:

> An increasing number of European aviation training providers need to shift more of their theoretical knowledge instruction footprint to a remote/virtual environment to enable continuity of the planned training. National Competent Authorities are encouraged to facilitate this change as much as possible. *EASA Guidance for allowing virtual classroom instruction and distance learning* (Guidelines in relation to the COVID-19 pandemic), Issue 5 | 18.08.2020.

This tendency towards using virtual environments for instruction delivery has persisted after the COVID crisis and is expanding.

Hence, the purpose of this guidance material is to provide recommendations to AOCs and ATOs wishing to implement VC instruction for aviation academic, theoretical and operational knowledge, while maintaining an adequate level of training effectiveness and knowledge transfer.

Chapter 2 - Risk assessment

As indicated, the goal of this guidance material is to provide recommendations for the implementation of Virtual Classroom (VC) instruction for aviation academic, theoretical and operational knowledge, as an alternative to traditional classroom training, while maintaining an adequate level of training effectiveness and knowledge transfer.

Therefore, before engaging in Virtual Classroom (VC) instruction, AOCs and ATOs should perform a risk assessment to evaluate and mitigate the risks during the transition from traditional to virtual classroom training delivery. Specifically, the evaluation should consider:

- The qualification of the instructors
- The information given to the trainees
- The technical specification of the tool/equipment/software
- The training policy and associated procedures
- The potential adaptation of the training objectives

Please see detailed Risk Assessment provided in Appendix 1.

Chapter 3 - Training policy and procedures

AOCs and ATOs should integrate into their training policy and associated procedures the guidance for the development and delivery of VC instruction.

This guidance should:

- Include the mitigation measures to the risks associated with the transition from traditional classroom training to VC Instruction
- Describe the human and technical resources to ensure that the training effectiveness under VC instruction is at least equivalent to the training effectiveness in traditional classroom training

Procedures, including controls, that should be considered comprise, but are not limited to:

- The maximum number of trainees for adequate interaction and monitoring of the trainees' engagement
- Considerations to different time zones
- Method(s) by which the trainees' identity will be validated
- Trainees' equipment requirements (e.g., minimum screen size required, microphone, camera, etc.)
- A process to validate that trainees' facilities and equipment are adequate to enrol for VC instruction
- The level of support, in terms of access procedures and IT support processes, that the trainees will receive
- The process to address a situation where the trainee(s) or instructor connectivity loss cannot be resolved promptly
- The tools to be utilized to ensure the trainees' engagement
- Availability of Quick Reference Guides for instructors and trainees containing policies, procedures and techniques related to VC instruction
- Instructors training on facilitating and teaching in a virtual classroom environment
- Requirements for trainee(s) to complete the end-of-course academic evaluation(s) at a physical location where it can be proctored by a qualified instructor, or a method that will ensure the integrity of the evaluation when conducted virtually
- A method to determine the effectiveness of the training

Please see Annex 2, FAA AC61-138A for a more detailed list of procedures and controls that should be considered.

Chapter 4 - Ensuring the quality of VC instruction.

A variety of tools are available to deliver VC instruction in real time, via an online platform. The following section provides recommendations for AOCs and ATOs to ensure that trainees make satisfactory academic progress under the supervision of competent instructors, and that a reliable record of the completion of training is maintained.

Note: The AOCs and ATOs should consider conducting additional internal audits during the implementation of VC instruction to ensure that the quality of the training is maintained.

4.1 Best practices for the training delivery

The experience gathered by corporate learning departments that have been hosting VC instruction successfully for several years, suggests that delivering training in a virtual classroom is best accomplished as a team rather than a single individual. Their experience suggests the following roles, for optimal delivery.

- **Producer**: The virtual classroom expert who provides technical expertise. Additionally, this role ensures that the session starts and ends on time, manages the chat area, manages polls, sets up exercises and provides first line trainee(s) IT support.
- **Instructor**: The instructor in charge of leading the training session, who has received additional training and assessment in the delivery of training using this medium.
- **Administrator**: The person in charge of event planning, instructor/producer logistics (are they co-located or remote from each other), course enrolment (including providing log-in details and ensuring course preparatory materials and guides are available) and ensuring the training record is updated as required.

4.2 Platform and equipment

Choosing the right platform

It is important to choose an online learning platform that is intuitive, engaging and enjoyable to use to ensure a successful learning experience.

Some of the factors to consider when choosing a learning platform include:

- Capability to ensure trainees' identification and continuous assessment of the level of communication with all trainees.
- User-friendly and intuitive learner interface: Thinking about the user's experience, the platform features, the user interface, the mobile usability, and security measures.
- Compatibility and usability: Choosing a platform that accommodates different browsers, devices, and operating systems, and easy-to-navigate menus.
- Scalability: Are there any restrictions in terms of capability and number of users:
  - Can it handle a large number of users/trainees.
  - Will it be possible to manage/share large amounts of data/training materials.
- Customization: What customization options are available within this platform. Does it support integration with other software/applications.

- Resolution: Does it provide a high enough resolution to watch videos or read large electronic files.
- Interactive features and functionality: Does it provide the necessary tools for instructors and trainees to interact in a virtual environment, such as:
  - White board features that can be opened up to trainees to collaborate
  - Breakout rooms, to replicate in-classroom group learning activities
  - Chat, both private and group chat
  - User screen sharing, both for instructor and trainees
  - Status change icons, allowing trainee(s) to raise hands, use emoticons, etc.
  - Possibility to create polls, surveys

Equipment considerations

Computer or tablet

Although it may be possible for the trainees to use a tablet to participate in VC instruction, a tablet would not be suitable for the instructor who needs to quickly access different documents, work on multiple windows or tabs, use different tools to interact with the trainees, etc.

Another factor to consider is the screen size. A tablet usually has a smaller screen size than a computer, which may limit the viewing area or multitasking ability.

Headset

A good quality headset with a microphone is critical to enable clear and effective communication. It can also eliminate background noises or disturbances.

High-resolution webcams

Most laptop models come with decent built-in webcams that can be used for video recording or live teaching sessions. However, if high-quality output is required, a peripheral webcam should be considered.

4.3 Level of communication

Whether instruction is delivered in a physical classroom or via VC instruction, the training methodology must be interactive, i.e., allowing instructors and trainees to interact (including visually) in a real-time environment that facilitates conversation among and between all the trainees and the instructor concurrently.

Therefore, part of classroom instruction delivered by an instructor to a trainee may be replaced by VC instruction provided that an adequate level of communication is ensured with appropriate equipment and tools.

An adequate level of communication should meet the following criteria:

- Continuously maintain an active interaction: dynamic and two-way flow of communication without delay
- Capability to share relevant materials, as specified in the training manual, for the appropriate lesson, unit, or course
- Maintain a “video and audio” interactive communication by allowing for non-verbal communication cues (facial expression, tone of voice, etc.)

- Ensure an appropriate level of trainees' attentiveness by providing guidance to the trainees, e.g., creating a quiet learning environment without distractions
- Capability to monitor what the instructor's screen displays
- Capability to follow the part of the presented content the instructor is focusing on by means of a digital pointer

4.4 Course content and training materials

Course content

AOCs and ATOs must analyze the Learning Objectives (LOs) of the course they want to deliver by means of VC instruction, to identify the LOs of the course that are suitable for a VC environment and those that are not. Not all LOs will be suitable for the VC environment.

Trainees' participation and engagement is of outmost importance. Therefore, it is essential that the lesson plans foster interactions between the instructor and the trainees, and between the trainees themselves, by including time for debates, Q&A sessions, group discussions, and by adapting:

- verbal quizzes to polls
- small-group activities to groups in virtual breakout rooms
- writing on a flip chart to using the virtual whiteboard
- raising of hands to the use of status change icons

Training materials

Training materials must be adapted to the VC environment. An instructor guide that describes the activities and tools, with a detailed timeline and division of tasks and roles between instructor and producer (where used) should be developed.

Training material characteristics to be considered:

(1) Content and lesson flow for VC instruction

(2) Incorporation of VC tool features (e.g., chat, breakout rooms, etc.) into the course design

(3) Integration of regular interaction, e.g., every 3 to 5 minutes

(4) Amount of information per slide (usually one key concept per slide)

(5) Use of videos (definition of videos, required streaming bandwidth, etc.)

(6) Division of tasks and roles between instructor and producer (where used)

4.5 Instructors

The AOC and ATO should ensure that the instructor delivering VC instruction:

(1) Has access to an Instructor Quick Reference Guide, with the associated policies and procedures for VC instruction.

(2) Has received appropriate training covering at minimum learning style, teaching method associated to VC instruction, and the chosen online platform system management.

(3) Has demonstrated his/her ability to manage time, training media and equipment to ensure that training objectives are met.

(4) Has demonstrated his/her ability to performs assessments in the context of VC instruction.

Attendance records

The instructor delivering a VC lesson, unit or course, should be responsible for the attendance records by ensuring that trainees are participating in the VC instruction with the appropriate level of engagement and interaction during all the lesson, unit or course.

Non-attendance, in case of interruption or loss of level of connectivity, should be managed in accordance with the "non-attendance" policy, as in actual classroom instruction.

Maintaining constant interaction

Some considerations for the instructor to ensure active participation from the trainees:

- Having all trainee(s)s turn on their cameras during the entire duration of the session
- Monitoring the chat for questions and responses in real-time
- Providing dedicated time to a Q&A
- Fostering small-group discussions using the virtual breakout rooms

4.6 Trainee

The trainee should have access to a Trainee Quick Reference Guide for VC instruction with the associated trainee policies and procedures.

AOC and ATO should ensure that the trainee receiving VC instruction has attended a briefing on the VC policy and procedures.

AOCs and ATOs should collect and analyze trainees feedback to evaluate the training effectiveness of VC instruction and ensure its continuous enhancement.

4.7 Training effectiveness

Number of trainees and training time

The maximum number of trainees should be established taking into account the limitations of the platform to maintain an adequate level of communication and interaction between instructor(s) and trainees, and among trainees. Considerations should also be given to the need for the instructor to maintain visual contact with all trainees, which may also have an impact on the maximum number of trainees allowed.

Note: Nevertheless, the AOCs and ATOs must comply with regulatory requirements regarding the maximum number of trainees for VC instruction.

According to the industry's feedback it is recommended:

- Not to exceed five hours of VC instruction per day
- To provide a break of at least 15-20 minutes should be planned for every hour of VC instruction.

Regularly collecting and analyzing instructors and trainees feedback participating in VC instruction within the above limits will permit to validate or adapt the above recommended limitations.

4.8 Trainee(s)' examination

After finishing VC instruction, online examination may not be acceptable to the CAA and may need to be completed in person by the trainee, at the training center, in which case a short refresher training is recommended.

4.9 Training system feedback loop

AOC and ATO should ensure that the instructor delivering VC instruction:

- Reports strengths and weaknesses of the training system (training environment, curriculum, assessment/evaluation), including feedback from trainees
- Suggests improvements for the training system

Note: The feedback loop should also include trainees feedback (see 4.6 Trainee).

4.10 Recording of the lessons, units or courses

AOCs and ATOs should consider recording VC lessons, units or courses for the benefit of the trainees and the instructors:

- Trainees who could not attend the live session, or who experienced technical issues, can review the recording for the section(s) they may have missed.
- Trainees can go back to the recording to review content to refresh or clarify concepts.
- Instructors can go back to review the trainees' performance during the session.

Chapter 5 - Regulations and guidance materials

Although most regulations still only allow distance learning for the trainees' pre-study of the theoretical knowledge, not VC instruction, CAAs and regulators across the world, including EASA, the FAA, the French DGAC, and others, have started allowing the use of VC instruction and have issued guidelines supporting its use for certain elements of flight crew training, i.e., for ground school and theoretical knowledge instruction and crew resource management (CRM).

An important point to retain is that VC instruction, as a substitute to classroom instruction, is only acceptable if an adequate level of communication and interaction is ensured and that the same learning outcomes as with traditional in-person training can be achieved.

The following section provides some examples of published guidelines and regulations.

EASA guidance and regulations

In 2020 during the COVID crisis, EASA published "Guidelines for allowing virtual classroom instruction and distance learning for training organizations during COVID-19 outbreak".

These guidelines provided criteria for the Competent Authorities to assess and accept arrangements for VC instruction and for European aviation training providers, under the scope of Regulation (EU) 2018/1139 (The Basic Regulation), for conducting theoretical parts of the training according to the applicable training program/syllabus in a virtual classroom.

The guidelines stated that:

"*The face-to-face classroom instruction delivered by an instructor may be replaced by virtual classroom instruction, such as videoconferencing, if an acceptable level of communication and interaction is ensured with appropriate equipment and tools. The virtual classroom instruction should provide real-time instructor-led learning where students can interact, communicate, view and discuss presentations. The ATO should also ensure that students make satisfactory academic progress and to maintain a reliable records for the completion of training.*"

Encouraging the shift to remote or virtual environment for theoretical knowledge instruction:

An increasing number of European aviation training providers need to shift more of their theoretical knowledge instruction footprint to a remote/virtual environment to enable continuity of the planned training. NCA are encouraged to facilitate this change as much as possible.

AMC2 ORO.FC.115 Crew resource management (CRM) training

ED Decision 2022/014/R

(b) ….

(3) Virtual classroom training

Notwithstanding (a)(2) of AMC1 ORO.FC.115, classroom training may take place remotely, using a videoconferencing tool. The tool should permit real-time interaction between the trainees and the trainer, including speech and elements of body language. It should also be capable of transmitting any document to

the trainee that the trainer wishes to present. The CRM trainer should establish the list of trainees in advance. Their numbers should be limited to 6 to ensure a sufficient level of interaction during the training session.

FAA

In June 2023, the FAA published FAA AC61-138A, which describes acceptable means, but not the only means, to deliver the academic portion of the ATP Certification Training Program (CTP) via VC instruction.

AC61-138A states that classroom instruction may be conducted via VC instruction, provided that VC instruction achieves the same level of training effectiveness as in a physical classroom environment, and that it is interactive. Asynchronous methods of instruction (e.g., prerecorded video lessons, computer-based training, etc.) are not considered acceptable methods of meeting the requirements of classroom instruction.

13.3 Methods of Classroom Instruction. Section 61.156(a) requires an applicant to receive at least 30 hours of classroom instruction ("classroom instruction" means that the instruction is provided in a fully interactive environment). Classroom instruction may be accomplished in a physical classroom or by virtual classroom instruction methods as long as the training objectives are satisfied. Regardless of whether the training provider chooses to accomplish the academic training in a physical classroom or through the utilization of a virtual classroom instruction methodology, the training provider's method for classroom instruction must be interactive. In other words, classroom instruction must allow the instructor and students to interact (including visually) in a real-time environment that facilitates conversation among and between all the students and the instructor concurrently. Additionally, classroom instruction allows the instructor to monitor and measure student engagement in real time. Therefore, asynchronous methods of instruction (e.g., prerecorded video lessons, computer-based training, correspondence learning, etc.) are not considered acceptable methods of meeting the requirements of classroom instruction required by § 61.156(a). Any virtual classroom instruction should be synchronous (i.e., all students participating simultaneously) and instructor-led. This instructional method is commonly termed "virtual instructor-led training (VILT)."

Please see Appendix 2 for more details.

Directorate General for Civil Aviation (France)

The French DGAC allows VC instruction "for CRM courses for pilots for single-pilot operators, not for other operators, and for any other training for which the means of training is not prescribed by the regulations".

Please see Appendix 2 for more details.

Conclusion

As evidenced in this guidance material, VC instruction can provide many benefits for both the trainees and the instructors, such as:

- Flexibility to attend the training regardless of location
- Enhanced learning effectiveness by allowing the trainees to create the learning experience that works best for them
- Increased trainee participation and engagement through interactive modules, simulations, and games
- Easy and repeated access to training materials
- Allowing for individual trainees' performance to be live-monitored and reviewed at any time later on by the instructor
- …

However, to ensure the effectiveness and efficiency of VC instruction, there are aspects to consider prior to its implementation, such as:

- Technological infrastructure and support required
- Online cybersecurity standards
- Data protection and data restrictions
- Technical challenges for the end user, such as unstable internet connection or connectivity interruptions
- Ensuring that the instructors are comfortable using the digital tools; some instructors may face challenges in acquiring and adopting the technology
- …

Hence, the importance, prior to implementing VC instruction, to perform a risk assessment that will evaluate the qualification of the instructors, whether instructors and trainees have access to suitable equipment to ensure an appropriate level of communication and interaction as in an actual classroom environment, that a training policy and associated procedures for VC instruction have been defined, and that VC instruction remains effective to achieve the learning objectives.

The COVID crisis created the need for VC instruction; technological advances in online learning, and the changes in the learning habits of the younger generations will continue to drive the expansion of VC instruction in the domain of aviation training.

CAAs and regulators are adapting to the rapid expansion of VC instruction, and although many are still limiting distance training to pre-study to classroom training, some have already issued guidance materials and regulations allowing VC instruction, though mostly for aviation academic, theoretical and operational knowledge and CRM training at this stage.

Appendix 1 - Risk assessment

Hazard	Risk	Mitigation
Level of communication as within an actual classroom	Marginal active exchange between the trainee(s) and the instructor Poor non-verbal communication cues (loss of trainee(s) understanding …) Poor level of trainee(s) attentiveness Marginal management of interruption by trainee(s) asking questions	Definition of a proper level of communication and interaction for both the communication/interaction initiated by instructor and those initiated by trainee(s). Define ideal VC lesson length and associated breaks in between lesson sections.
Equipment	Poor pace and noisy/busy room or inappropriate room to study Poor video/picture resolutions or audio hindering comprehension of the training material	Definition of appropriate equipment and environment for suitable VC instruction and learning
Connectivity Adequacy and Potential Failures	Stakeholders will attempt to connect from different devices, over different networks causing disruptions or disconnections to the flow of training	Design, implement and communicate policies and procedures to overcome the risk.
Tool	Poor instructor assessment of the trainee(s)' level of communication Poor identification of the actual trainee(s) attending the instruction Poor capacity of the tool for trainees to achieve the learning objectives	Definition of appropriate functionality of the Tool for virtual classroom instruction Create a procedure for taking attendance. Ensure trainees are truly present in the VC by regularly interacting with them via the techniques taught during the instructor familiarization training.
Instructor competence	Lack of instructor familiarization with virtual classroom instruction systems Inappropriate instructional methods to virtual classroom instruction	Definition of instructor specific familiarization for training and assessment with virtual classroom instruction system.

Hazard	Risk	Mitigation
	Instructor assessment methods inappropriate to virtual classroom instruction	
Training material	Training material not adapted to VC	Short term: review training material and adapt where required/possible. Long term: take VC teaching into account when developing future training material.
Training effectiveness	Lack of monitoring of the trainees by the instructor Exceedance of trainee's cognitive limitations Implementation of VC with limited previous experience	Determination of adequate instructor/trainee ratio and limitations for VC training time. Use of a producer and administrator to minimize instructor workload. Instructor specific familiarization Procedures to ensure satisfactory trainee progress.
Regulatory Approval	Regulators may not understand or be comfortable with the technology and may block implementation.	Proactively proffer risk assessments, change management and completion data from any successful implementation for any industry or discipline.

Appendix 2 - Regulations and guidance materials

FAA AC61-138A

AC61-138A on delivering the academic portion of the ATP CTP via VC instruction.

13.3.2 Student engagement is a critical aspect of classroom instruction, regardless of whether it is administered in person or through a virtual classroom. The ATP CTP should contain adequate policies and procedures that will ensure that students remain engaged in the learning process during the ATP CTP.

- Restrictions on cell phone use and mitigations of other distractors.
- Adequate breaks throughout classroom day.
- Student attendance policies.
- Instructor monitoring of student engagement.

13.3.3 While an ATP CTP may employ a virtual classroom instruction methodology to deliver the academic portion of the ATP CTP, training providers should consider the nuances and potential challenges of such a methodology. For an ATP CTP that utilizes, or plans to utilize, a virtual classroom instruction methodology, the ATP CTP application should describe in detail how the training provider will ensure training effectiveness comparable to that found in the physical classroom. The following list includes areas which the training provider should consider when developing a virtual classroom instruction methodology for the ATP CTP and may be useful in ensuring that the objectives of the training can be achieved. Policies, procedures, and controls that should be considered include, but are not limited to:

1. A description of the extent to which student cameras will be utilized during virtual classroom instruction;
2. Student equipment requirements for the virtual classroom instruction (e.g., minimum screen size required, microphone, camera, software, operating system, etc.);
3. How the training provider will support students with virtual classroom instruction, including access procedures, IT support processes, and procedures for the student to notify the instructor of lost communications;
4. A process to address an issue where the student or instructor connectivity issue cannot be resolved promptly, which should include that the student will be rescheduled for that training module and that an instructor will repeat the module with the student to receive module credit;
5. A method for the training provider to validate that student facilities and equipment are adequate for enrollment of virtual classroom instruction;
6. Methods/tools to be utilized to ensure student engagement;
7. How training will be accomplished when students and instructors are in different time zones;
8. Description of the training platform the training provider intends to utilize, including the methods used to validate the effectiveness and usability of the platform to deliver the training;
9. Training for instructors on how to facilitate and teach in a virtual classroom;
10. A method to determine the effectiveness of training, to include validation of student knowledge throughout virtual classroom instruction and upon arrival at the training provider for completion of the training curriculum;

11. Instructor qualifications and ability to instruct through virtual mechanisms, including the determination of instructor eligibility, virtual classroom instruction designation, and the determination of the effectiveness of the instructors conducting virtual classroom instruction (e.g., effective communication over virtual platforms, or the ability to troubleshoot the software platform);
12. A method to identify and document the training the instructor has successfully completed to qualify for virtual classroom instruction;
13. A means (included in student records as applicable) to identify students that have received virtual classroom instruction;
14. A method of ensuring that the management, staffing, instructors, training curricula, and courseware utilized for virtual classroom instruction remain under the control of the training provider;
15. A method of ensuring that all of the training provider's employees with virtual classroom instruction duties and responsibilities are adequately trained in their duties and responsibilities;
16. A description of how the training provider will notify and provide access to the Administrator for all virtual classroom instruction training delivered;
17. A policy that requires students to complete the end-of-course academic evaluation(s) at the training provider's physical location where it can be proctored by a qualified instructor, or a method that will ensure the integrity of the evaluation when conducted virtually;
18. A description and demonstration of the maximum class size that will allow for adequate interaction and student engagement monitoring for virtual classroom instruction;
19. The methods by which the training provider will validate student identity (e.g., instructors will validate the student's personal information by comparing the documents supplied by the student during the enrollment process to the materials and facial recognition presented on the video system); and
20. A policy identifying that the courseware and content utilized in virtual classroom instruction is identical to that which is delivered in a physical classroom.

Directorate General for Civil Aviation (France)

GUIDE FORMATIONS DES EQUIPAGES – AVIONS

Réglementation et pratiques recommandées pour les formations des équipages de conduite (publiée 9 novembre 2023)

CREW TRAINING GUIDE – AIRCRAFT

Regulations and recommended practices for flight crew training (published 9 November 2023)

Original French version	(Note: This is a free translation into English for the purpose of this guidance material.)
Appendice. 11 Formation en classe virtuelle La lecture du Chapitre 0. Généralités GFE-A est un préalable indispensable à la bonne compréhension du présent appendice.	Appendix. 11 Virtual classroom training Reading Chapter 0. General GFE-A is an essential prerequisite for a good understanding of this appendix.
11.1 Références réglementaires et guides • AMC2 ORO.FC.115 §(b)(3) • Guidance for allowing virtual classroom instruction and distance learning	11.1 Regulatory references and guides • AMC2 ORO.FC.115 §(b)(3) • Guidance for allowing virtual classroom instruction and distance learning
11.2 Préambule La mise en place de nouveaux moyens de communication professionnels permet le développement de cours en classe virtuelle, c'est-à-dire des cours où le formateur et les stagiaires sont physiquement séparés mais peuvent interagir en direct via un système de visio-conférence.	11.2 Preamble The implementation of new means of professional communication allows the development of virtual classroom courses, that is, courses where the trainer and trainees are physically separated but can interact live via a video-conferencing system.
11.3 Champ d'application Les cours en classe virtuelle peuvent être mis en place pour: • Les cours CRM des pilotes pour les Exploitants opérant en monopilote [AMC2 ORO.FC.115 §(b)(3)]. Le recours à la formation CRM en classe virtuelle n'est pas autorisé pour les autres Exploitants. • Toute autre formation pour laquelle le moyen de formation n'est pas prescrit par la réglementation. Dans ce cas, les dispositions réglementaires et les recommandations définies au paragraphe §11.4 ci-dessous devraient être reprises en tant que bonnes pratiques sans constituer une obligation réglementaire.	11.3 Scope Virtual classroom courses are acceptable for: • CRM courses for pilots for single-pilot Operators [AMC2 ORO.FC.115 §(b)(3)]. The use of CRM training in virtual classroom is not authorized for other Operators. • Any other training for which the means of training is not prescribed by the regulation. In this case, the regulatory provisions and recommendations defined in paragraph §11.4 below should be taken as good practices without constituting a regulatory obligation.

11.4 Conditions de réalisation

Dans le cadre de l'approbation des programmes de formation les dispositions suivantes devront être décrites dans l'OM.D et approuvées par la DSAC. Ces dispositions sont obligatoires dans le cadre de cours CRM monopilote et constituent des recommandations dans les autres cas:

- Le nombre de stagiaires n'excède pas six et la liste des stagiaires est établie à l'avance,
- Le formateur et les stagiaires disposent d'un lieu calme, d'une connexion internet adéquate et d'un appareil adapté pour pouvoir assister au cours (un téléphone portable n'est pas acceptable),
- Le formateur et les stagiaires doivent être visibles (la posture et les mains devraient être visibles afin d'apprécier le langage non verbal de ces derniers) et audibles,
- Le formateur peut diffuser aux stagiaires de façon lisible tout document nécessaire à la formation.

11.4 Conditions for implementation

As part of the approval of training programs, the following provisions must be described in the OM.D and approved by the Directorates for Civil Aviation Safety (DSAC). These provisions are mandatory in the context of single-pilot CRM courses and constitute recommendations in other cases:

- The number of trainees does not exceed six and the list of trainees is established in advance,
- The instructor and trainees have a quiet place, an adequate internet connection and a suitable device to be able to attend the course (a mobile phone is not acceptable),
- The instructor and trainees must be visible (posture and hands should be visible in order to appreciate the non-verbal language of the latter) and audible,
- The instructor can distribute to trainees in a legible manner any document necessary for the training.

De plus, il est recommandé:

- De mener une étude de changement permettant d'évaluer si les cours en classe virtuelle répondent aux besoins de formation et pourront être réalisés en adéquation avec les dispositions ci-dessus,
- De favoriser la participation active des stagiaires,
- D'effectuer une pause au minimum toutes les heures,
- De familiariser ou former les formateurs à l'utilisation adéquate des méthodes d'enseignement en visio-conférence (moyens de communication, gestion du temps, gestion des prises de paroles …),

In addition, it is recommended:

- To conduct a change management process to assess whether virtual classroom courses meet the training needs and can be carried out in accordance with the above provisions,
- To encourage the active participation of trainees,
- To take a break at least every hour,
- To familiarize or train instructors in the proper use of videoconference teaching methods (means of communication, time management, management of speaking, etc.),

• D'évaluer l'efficacité de la formation en classe virtuelle afin de l'améliorer. Pour cela l'évaluation des compétences des stagiaires ainsi que les remontées des stagiaires (via par exemple un questionnaire de satisfaction) pourront servir de données d'entrée	• To assess the effectiveness of virtual classroom instruction in order to improve it. To achieve this, the assessment of the trainees' competencies as well as the trainees' feedback (via, for example, a satisfaction questionnaire) can be used as input data
• De définir une procédure en cas de perte de connexion au cours de la formation (session de rattrapage, répétition des éléments manqués …) • Enfin, les cours en classe virtuel de CRM, comme tous les cours théoriques, font partie du champ de surveillance de la DSAC, les exploitants les mettant en oeuvre donneront un accès aux inspecteurs de la DSAC en cas de sollicitation par ces derniers.	• To define a procedure in the event of loss of connectivity during the training (catch-up session, repetition of missed elements…) • Finally, the CRM virtual classroom courses, like all theoretical courses, are part of the DSAC's monitoring scope; the operators implementing them will give access to DSAC inspectors if requested by the latter.

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