



Jordan Civil Aviation Regulatory Commission

## **Guidance Procedure: AWS 50**

# **Virtual Classroom Instruction and Distance Learning Guidelines during COVID-19 Pandemic**

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## 0. Introduction

### 0.1. Definitions and abbreviations

For the purposes of this Guidance, the following definitions shall apply:

- **Training provider:** Training organizations providing training for maintenance and continuing airworthiness personnel and CARC personnel.
- **Student:** CARC personnel under training, student maintenance personnel, maintenance and continuing airworthiness personnel, CARC personnel.
- **'Instructor-centered':** When the instructor is responsible for teaching the student.
- **'Student-centered':** Means that the student is responsible for the learning progress.
- **'Blended training':** Includes different instructional methods and tools, different delivery methods, different scheduling (synchronous/asynchronous) or different levels of guidance. Blended training allows the integration of a range of learning opportunities.
- **Classroom:** A physical, appropriate location where learning takes place.
- **Remote learning:** When the student and instructor, or source of information, are separated by time or distance and cannot meet in a traditional classroom setting. Information is typically transmitted via technology (email, discussion boards, video conference, audio bridge or data carrier such as USB, DVD, etc.) so that no physical presence in the classroom is required. It can be synchronous or asynchronous.
- **Virtual classroom:** A virtual environment, not physical, location where synchronous learning takes place.
- **Computer-based training (CBT):** Any interactive means of structured training using a computer to deliver a content. It needs to be complemented with close assistance by an instructor.
- **Distance learning asynchronous:** Training situations in which instructors and students are physically separated. The teacher and the students do not interact at the same time.
- **Distance learning synchronous:** Training situations in which instructors and students are physically separated. It is synchronous if the teacher and the students interact at the same time (real time).
- **E-learning:** Training via a network or electronic means, with or without the support of instructors (e-tutors).
- **Mobile learning (M-learning):** Any sort of learning that happens when the student is not at a fixed, predetermined location, using mobile technologies.
- **Web-based training (WBT):** Generic term for training or instruction delivered over the internet or an intranet using a web browser.

#### Abbreviations

AMC	Acceptable Means of Compliance
AWSD	Airworthiness Standards Department
CARC	Jordan Civil Aviation Regulatory Commission
JCAR	Jordan Civil Aviation Regulation
MTO	Maintenance Training Organization
MTOE	Maintenance Training Organizations Exposition

### 0.2. Purpose

This guidance procedure is designed to be used by the key management (post holders) of JCAR Part 147 approved maintenance training organizations (MTOs), training providers and the assigned inspector when:

Evaluating the compliance of the approved maintenance training organizations (MTOs) and aviation training providers conducting theoretical parts of the training according to the applicable training program/syllabus in a virtual classroom during COVID-19 Pandemic.



### **0.3. Distribution**

This procedure should be published on CARC official website. The holders of this procedure are CARC airworthiness standards inspectors and the key management (post holders) of CARC approved Part 147 maintenance training organizations (MTOs) as applicable. Holders are responsible to download this procedure and follow its guidelines.

### **0.4. Amendments**

This procedure will be reviewed each time there is a regulation change that affects it and as long as it is considered necessary by CARC. Any amendment to this procedure will go through CARC's document control procedure; the amendment should be approved by the Chief Commissioner/CEO and becomes effective only after incorporation to this procedure and publishing it on CARC official website. This Guidance shall enter into force on the twentieth day following that of its publication in CARC Official Website.

### **0.5. Competent Authority**

CARC is the competent authority designated for organizations approved/ accepted by CARC.

### **0.6. Associated Acceptable Means of Compliance**

CARC has developed associated addendum to the Acceptable Means of Compliance that detail specific matters, which have to be considered as an integral part of this procedure.

A complete listing of these documents, together with their applicability to the applicant/ approval holder is published at CARC website [www.carc.jo](http://www.carc.jo).

### **0.7. Demonstration of Compliance**

JCAR Part 147 approved maintenance training organizations (MTOs) and training providers shall, when so requested by CARC, demonstrate compliance of conducting theoretical parts of the training according to the applicable training program/syllabus in a virtual classroom during COVID-19 Pandemic.



## 1. Reserved

## 2. General

- (a) Due to COVID-19, the aviation training industry is currently experiencing a major shift to more on-line learning and instruction, such as distance learning and virtual classroom instruction. The change from the physical classroom to the virtual one is a major change, requiring the prior approval of CARC.
- (b) Nonetheless, on-line teaching requires careful thinking about how students and teachers are equipped for the change and serious consideration about whether the teaching style is still effective when taken out from the classroom and transposed to or mixed with technological devices. Moreover, inequalities are impaired when it comes to access to technology and digital devices, as many students may lack the connections and devices to learn remotely.
- (c) This guidance procedure provides guidelines for conducting theoretical parts of the training according to the applicable training program/syllabus in a virtual classroom. In order to maintain high-quality standards of training, hands-on practical training should be conducted as per the applicable training program.
- (d) A reasonable balance between the different training methods should always be ensured so that the student achieves the level of proficiency necessary for a safe performance of all related duties and responsibilities.
- (e) Even if this guidance material provides guidance for virtual classroom and distance learning, it does not mean that it is not required for the training providers to consider also practical training where appropriate and feasible.
- (f) Some of the principles illustrated in this guidance procedure can also be applied to other remote learning methods, such as instructional videos (video tapes, DVD, USB sticks, etc.), distributed by data carriers.

## 3. Scope

- (a) Regulation on the approval of organizations and personnel involved in these tasks:
  - (1) Maintenance licenses.
  - (2) Training for Maintenance: maintenance licenses theoretical basic training (147.200).
  - (3) Theoretical Aircraft type/task training 147.300.
  - (4) Aircraft type examinations and task assessments 147.305.
  - (5) Recurrent training, fuel tank safety, EWIS training, etc.
- (b) CARC/AWSD personnel initial and recurrent training in all domains.

## 4. COVID-19 Shift to More Distance Learning and Virtual Classroom Environment

- (a) An increasing number of 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.
- (b) In the context of COVID-19 pandemic, different ways of learning and communicating are necessary to successfully enable the continuation of the required training. Additionally remote learning will become very important.



- (c) There are two aspects of remote/virtual environment applicable to training that require careful consideration:
- (1) Distance learning;
  - (2) Substitute (or complement) face-to-face classroom instruction by virtual classroom instruction.
- (d) When deciding to allow distance learning, if applicable, or virtual classroom instruction, CARC require aviation training providers to perform a risk assessment that, as a minimum, carefully evaluates whether:
- (1) Students and theoretical knowledge instructors will have access to appropriate equipment to support remote learning/instruction or the shift from face-to-face to virtual classroom training;
  - (2) The teaching style remains effective in achieving the training objectives;
  - (3) The remote environment is able to reach each training objective.
- (e) Most traditional training delivery system can have virtual equivalents, such as:
- (1) A classroom can be physical or virtual;
  - (2) Tutorials can also be e-tutorials;
  - (3) Computer Based Training can also be available online outside of the training provider's material;
  - (4) Demonstrations, including those supported by demonstration equipment where virtual reality technology can be applied;
  - (5) Exercises carried out as groups or individuals and based on communications, presentations, and projects may be online in a small virtual classroom;
  - (6) The directed study including workbook exercises or assignments, is excellent for online Learning Management System use;
  - (7) In aviation industry field trips or aircraft and Part 145 maintenance organizations visits, the instructor can present from industry field, whilst students can have an online session (e.g. using Open Broadcaster Software) with the possibility of asking questions;
  - (8) Distance learning both methods synchronous and asynchronous are already in common use;
  - (9) E-learning;
  - (10) Mobile learning (M-learning);
  - (11) Web-based learning.
- (f) The aviation training providers should reflect the agreed approach with a (temporary) update of the training manual/ exposition. To shift from the face-to-face class to the virtual class is a transformation/ variation that must be managed according to the change management procedure described in the manuals of a training provider itself.
- (g) The change from the physical classroom to the virtual one is a major change, requiring the prior approval of CARC.
- (h) Depending on the process in place, the organization may need to request approval to deviate from its procedures.
- (i) Temporary changes to the exposition or stand-alone procedure may be agreed by CARC.



## 4.1 Distance Learning

- (a) Distance learning is not new and is covered by the following provisions in Part-66 and Part-147 Regulations:
  - (1) JCAR Part-66 Appendix III for type training: 3.1(e) Multimedia Based Training (MBT) methods may be used to satisfy the theoretical training element either in the classroom or in a virtual controlled environment subject to the acceptance of CARC.
  - (2) Annex 1 to JCAR Part-147 AMC applicable to both basic training and type training.
- (b) When introducing distance learning, due consideration should be given to students' evaluation. For this reason, after finishing the distance-learning course, the aviation training provider should have an evaluation meeting with the students at the training center.
- (c) During distance learning, the progress needs to be more closely monitored. This can be done by additional (online) tests. For most courses, examination may not be acceptable online and should be done at a later stage. A short refresher training may be desirable.
- (d) Internal audits: Distance learning requires additional attention during internal audits.

## 4.2 Virtual Classroom Instruction

- (a) In the context of the COVID-19 and the related restrictions, virtual classroom training should generally be considered an accepted alternative to face-to-face classroom training in the context of classroom training as required for both modular and integrated courses. To that end, this guidance procedure provide further criteria for CARC to assess and accept arrangements for virtual classroom instruction.
- (b) 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 training provider should also guarantee that students make satisfactory academic progress and maintain reliable records for the completion of training.
- (c) There are no requirements for IT infrastructure addressing personal data protection and security, change management, continuity, integrity, audits, user authentication privileges, logging of overall integrated system activity, etc.
- (d) However, many aviation training providers run their business in the paperless way with various types of IT tools, forming a more or less integrated IT system: Virtual Learning Environment (VLE), Learning Management Systems (LMS), Virtual Classrooms, Video Conferencing, cloud-based e-learning, progress tests from outsourced sites, E-books, Twitter, YouTube or other video channels, etc.
- (e) These requirements should be in place and constitute a crucial part of the compliance monitoring system.

### 4.2.1 Virtual Classroom Instruction–Level of Communication

- (a) An acceptable level of communication should meet all the following criteria:
  - (1) Live interactive instructor-led sessions in an online learning environment within a shared online space;
  - (2) Maintain continuously an active and simultaneously exchange between instructor and student(s): dynamic and two-way flow of communication without delay;
  - (3) Able to share relevant training material as specified for the appropriate lesson, unit or course in the training manual;

- (4) Maintain a “video and audio” interactive communication by taking into account non-verbal communication cues (tone of voice, facial expression ...);
  - (5) Establish a policy for the use of the virtual classroom instructions such as “raise your hand, question, ...”;
  - (6) Monitor what the instructor’s screen displays;
  - (7) Ensure that students have tools to present learning content in different formats, as well as to implement collaborative and individual activities. The instructor should have the particularly important role of the moderator who guides the learning process and supports group activities and discussions.
- (b) Virtual classroom instruction requires the students and the instructor to interact equally – active participation, collaborative work, and communication are encouraged in this type of classroom. The instructor creates opportunities for both independent learning and learning from one another, and guides the students in developing and practicing the skills they need.
- (c) Doing this at the student’s own pace, as far as practicable, would enhance a student-centered training. This increases the motivation level of the students as well as their interest in the learning activities.

#### **4.2.2 Virtual Classroom Instruction—Appropriate Equipment and Tools**

- (a) The equipment/tools needed for the virtual classroom instruction should ensure an acceptable level of communication without technical interruption during the virtual classroom instruction.
- (b) The equipment should ensure the students identification (visual when needed) and, a continuous assessment of the level of communication with all students.
- (c) The equipment should permit the instructor to achieve the same training objectives and quality of instruction compared to instruction within face-to-face classroom instruction as defined by the training provider.
- (d) Generally, smart phones are not considered adequate for presenting video and images, although they may be very effective for attending a lecture.

#### **4.2.3 Virtual Classroom Instruction—Instructor**

- (a) The training provider should ensure that the instructor delivering virtual classroom instruction:
  - (1) Has received appropriate training covering at least learning style, teaching method associated to virtual classroom instruction, such as videoconferencing, and a familiarization to the used virtual classroom instruction system;
  - (2) Demonstrates his ability to manage time, training media and equipment and tool to ensure that the training objectives are met;
  - (3) Performs any necessary assessment of the student(s) including proper identification of the assessed student.
- (b) Over the course of the virtual classroom instruction, the students should be encouraged by the instructor to participate at regular intervals. This can be achieved by a variety of activities such as brainstorming, small group discussion, collaborative and individual tasks, Questions & Answers (Q&A) sessions, etc.

#### **4.2.4 Virtual Classroom Instruction—Student**

- (a) Creating positive learning environment, engaging students and encouraging active participation helps students achieving the learning objective.

- (b) During the virtual classroom instruction, there should be opportunities for frequent interaction between student and instructor, student and other students, and student and content: instruction in a synchronous virtual classroom can only be successful with the active participation and engagement of the students. This creates a positive learning environment and helps the students achieve the expected outcomes.

#### **4.2.5 Virtual Classroom Instruction—Acceptable Level of Academic Effectiveness**

(a) Maximum number of students and training times

The maximum number of students should be established considering the capability of the tool to maintain an acceptable level of communication and it should be adapted to the training objectives. Ideally, it should avoid exceeding a maximum number of 12 students. Training design should take into account that students may find virtual classroom training more tiring than traditional classroom training and the daily training hours may therefore need to be reduced. A break of reasonable time should be planned for every hour of virtual classroom instruction.

(b) Attendance records

The instructor delivering the virtual classroom instruction should be responsible for the attendance records of the students by ensuring the students are in the virtual classroom instruction with the appropriate level of communication during all the virtual classroom instruction.

(c) Interruption of connection, loss of communication

Interruption of connection and loss of communication amongst individual participants can happen during a virtual classroom session. The training provider should develop a policy on the progress of such a session, repetition of instructed training element and re-involvement of participants affected by the temporary loss of connection. Non-attendance should be managed in accordance with the “non-attendance” policy as in a face-to-face classroom instruction.

(d) Examinations/Evaluations

For most courses, examination may not be acceptable online and should be done at a later stage. A short refresher training may be desirable. When examination or evaluation is necessary in virtual classroom, positive identification of students should be assured. Oral exams or remote forms could be used, provided the system used is the same for all students.

### **4.3 Training System Feedback Loop**

The aviation training provider should ensure that:

- (a) The participants report strengths and weaknesses of the training system (training environment, training program, assessment/evaluation) and suggest improvements;
- (b) The instructor keeps an effective time management;
- (c) Discussions among classmates is facilitated;
- (d) Feedback system for student is elicited.

### **5. Oversight by CARC and Internal Audits**

- (a) CARC should have access to the virtual classrooms and sample the training.
- (b) Intensified oversight is recommended in particular in the initial phase.
- (c) Internal audits planned and spot by training organization quality department on distance learning process and virtual classrooms is required and recorded.

