Aviation Training Organisations – Distance Learning (DSL) Training Methods	Issue 1 01 December 2022

GENERAL

Civil Aviation Safety Authority Advisory Circulars (AC) contain information about standards, practices and procedures that the Director has found to be an Acceptable Means of Compliance (AMC) with the associated rule.

An AMC is not intended to be the only means of compliance with a rule, and consideration will be given to other methods of compliance that may be presented to the Director. When new standards, practices or procedures are found to be acceptable, they will be added to the appropriate Advisory Circular.

This Advisory Circular also includes Explanatory Material (EM) where it has been shown that further explanation is required. Explanatory Material must not be regarded as an acceptable means of compliance.

PURPOSE

This Advisory Circular provides methods, acceptable to the Director, for showing compliance with the aviation training organisation requirements of Rule Part 141 and explanatory material to assist in showing compliance.

RELATED CAR

This AC relates specifically to Civil Aviation Rule Parts 141.

CHANGE NOTICE

This AC replaces Initial Issue dated 1 October 2021.

APPROVAL

This AC has been approved for publication by the Director of Civil Aviation
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EM 141.57 Scope and Purpose

This AC applies to PNG Part 141 aviation training organisations who want to implement distance learning training method (DSL) within its approved scope of approval.

Training Courses and Assessments are offered by PNG Part 141 training organisations under rule 141.57. This AC provides guidance to Part 141 training organisations to ensure that DSL training methodology provides equivalent results when compared to traditional in-classroom training.

EM 141.57.1   General Principles

There are two different types of distance learning training, namely synchronous and asynchronous methods as follows:

EM 141.57.2   Distance Learning Asynchronous

Distance learning reflects training situations in which instructors and students are physically separated. The instructor and the students do not interact at the same time.

This training method is ''Student-centred'' (i.e. the student is responsible for the learning progress.

EM 141.57.3   Distance Learning Synchronous

Distance learning reflects training situations in which instructors and students are physically separated. The teacher and the students interact at the same time (real time).

This training method is ''Instructor centred'' (i.e. instructor is responsible for teaching the student).

It is possible to deliver a blended training which integrates a range of learning opportunities by implementing:
- different training tools (e.g. slideshows, virtual aircraft, virtual classroom.)
- different delivery methods (CBT, WBT, synchronous DSL, lecturing…)
- different scheduling (synchronous/asynchronous)
- different levels of guidance.

This AC is focused on synchronous DSL, which is the most common DSL type implemented by PNG Part 141 training organisation.

Synchronous DSL can be used to teach theoretical and practical elements under conditions, which are further detailed in this AC. However, the suitability of DSL is limited when teaching:
- Theoretical knowledge level 3 topics (Refer AC 66-1 Appendix 6 for meaning of level 1, 2 & 3); and
- Practical elements.

EM 141.57.4   DSL Training Tools

(a)   Appendix A table 3, details the following training tools which can be used during synchronous

DSL either for theoretical part (basic or type) or practical element of the type training:
Slideshow presentation
(i)   Manuals
(ii)   Computer (desktop, PC, laptop, etc.)
(iii)   Mobile devices (such as, but not limited to, tablets, etc.)
(iv)   Videos
(v)   Virtual reality
(vi)   Virtual classroom

(vii) Virtual aircraft

(b) A combination of several training methods/tools is recommended in order to increase the overall effectiveness of the training.

(c) Mobile phones cannot be used for the video presentation of the virtual classroom as the screen size does not allow to attend virtual classroom with sufficient comfort (i.e. audio only is acceptable on mobile).

EM 141.57.5   Approval Process of the addition of DSL Training Method

(a) In order to be approved to use DSL training method on a permanent basis, the training organisation should:

(i) Notify the Director of the proposal to change from the traditional training method to DSL training method as required by rule 141.103(d)(4).

(ii) The notification above should be in the form of a letter of intent (LOI) to the Director, supported by proper risk assessments (rule 100.61) and change management (rule 100.65) assuring the Director of the capability of the ATO in fully implementing the DSL training method in accordance with this AC.

(iii) Once the Director accepts the LOI, the applicant may proceed with the below steps.

(iv) Submit form PEL LWR to PEL AME Licensing Inspector applying for the approval of the Type Rating training course to be conducted with DSL training method incorporated. A copy of this form is provided in Appendix B.

(v) Submit for approval the amended MTOE describing the implementation procedure of DSL training method and associated training tools in compliance with all technical instructions detailed in this AC.

(vi) Appendix C provides the CASA AME Licensing Inspector's checklist to be used to audit the DSL training either on-site or remotely (remote audit not applicable for initial application)

(vii) Similar approval process is required whether it is an initial application or a change of an existing approval.

(b) Maintenance Training Organisation Exposition (MTOE) Amendments

(i) At the minimum the following MTOE chapters have to be amended to describe the use of DSL Organisation of courses:

1. Preparation of course material
2. Preparation of classroom and equipment
3. Conduct of theoretical training and practical training
4. Records of training carried out
5. Training at locations not listed in MTOE
6. Qualifying the instructors
7. Record of qualified instructors and examiner

(ii) Alternatively, DSL procedure can be consolidated in a procedure describing only applicable conditions requirements. Applicable MTOE chapters should make a clear reference to this additional procedure.

(iii) DSL is not limited to any specific training site and both students and instructors can be present at different non-approved locations. Therefore, the training organisation is required to be approved to conduct **''off-site training''**. Although, the addition of a training method has no impact on the previously approved training sites or scope of approval, DSL is considered as a change requiring to submit a letter of intent (LOI) to the Director for prior approval before implementation of a DSL training method as per 141.103(d).

  (v) DSL training method is an additional training method to the existing physical classroom training. PNG Part 141 training organisations have to demonstrate the capability to conduct physical classroom to be approved to use DSL training method (i.e. availability of classroom, workshops, library, etc.).

EM 141.57.6 Synchronous Distance Learning Training Method

EM 141.57.6.1 Virtual Classroom

Virtual classroom is the most common training tool implemented by training organisations during synchronous DSL either theoretical or practical.

In a virtual classroom, students are connected with each other and the instructor through a video and audio connection instead of being physically together.

It is the media allowing the instructor to simulate a classroom and present the students slideshows, manuals, videos, virtual aircraft etc. This requires the use of adequate hardware and software by both students and instructors.

Virtual classroom has to allow a 2-way communication channel for a full video interaction between students and instructors, as close as possible to a real classroom.

Students should be able to highlight any difficulty during the training and ask possible questions to the instructor.

In a virtual classroom, interactivity between instructor and students is reduced compared to a real classroom environment.

Therefore, additional effort is necessary from instructor to maintain the attention of the students during the training, whether theoretical or practical.

Additional training for the instructor has to be considered by the training organisation with regards to DSL specific pedagogical skills.

  (a) Hardware requirements for students:
   (i) a desktop computer or a laptop or tablet with sufficient performances to attend the virtual classroom without disruption, equipped with webcam, headset and microphone
   (ii) one screen having a sufficient size to comfortably display all required training material (AMM, slideshows, schematics). The use of a second screen is highly recommended.
   (iii) The use of mobile phone or tablet with screen size smaller than **10 inches size** is not allowed to attend virtual classroom as the screen size is not sufficient to display complex document such as schematics with sufficient comfort. However, it can combine with a computer for audio purposes.
   (iv) Internet connection with a sufficient bandwidth to attend the virtual classroom without disruption or discomfort
   (v) Both computer and screens have to meet the minimum specifications of the online meeting software in use.

   In some cases, students are all physically present in a real classroom (e.g. customer classroom) and the instructor present at a different location (e.g. training organization headquarters).

   In such cases, students' hardware requirements remain applicable. The use of an additional larger screen or smartboard readable by all students present in the classroom is recommended.

(b)   Hardware requirement for instructors:

  (i)   a desktop computer or a laptop or tablet with sufficient performances to conduct the virtual classroom without disruption, equipped with webcam, headset and microphone

  (ii)   2 screens having a sufficient size to comfortably display all training material (AMM, slideshows, schematics). The use of a second screen is necessary to be able to display both virtual classroom (i.e. students' webcam) and training material

  (iii) Internet connection with a sufficient bandwidth to conduct the virtual classroom without disruption or discomfort

  (iv)   Both computer and screens have to meet the minimum specifications of the online meeting software in use.

(c)   Software requirement:

Online meeting software (i.e. virtual classroom) allowing 2 ways communications and sharing presentations and other documents.

Prior to first DSL training, both instructors and students have to receive sufficient training on the specificities of synchronous DSL and on the use of virtual classroom software:

Students have to be able to interact with the instructor and use the available functions of the meeting software (i.e, raise hand, share documents, mute microphone)

Instructors have to show a good command of the meeting software in order to be able to provide necessary guidance to the students during the training sessions.

It is recommended that the training organization arrange a test training session to ensure all students are sufficiently familiarized with the meeting software.

(d)   Instructor's qualification

The instructors have to be assessed and formally authorized by the training organization for the use of synchronous DSL training method and virtual classroom. DSL training method has to be formally added to the instructors' terms of reference. Training records and authorisation have to be kept in instructor's files.

(e)   Student attendance

Student's attendance has to be accurately recorded by the instructors on a regular basis (i.e. at the beginning of each class and after each break) and automatically if the software allows to record the actual student attendance.

Lost training sessions due to PNG Power cuts, interruption of connection or loss of communication shall be deducted from the attendance of affected participants and recovered at earliest opportunity.

(f)   Students training environment

Part 141 requires that training environment is maintained such that students are able to concentrate on their studies or examination as appropriate, without undue distraction or discomfort. When using DSL, instructors are not able to ensure this requirement is fulfilled for all students at any time of the training.

Therefore, it is required that each student signs a statement to commit to attend the course in the following conditions:

-     in a suitable environment (i.e. noise, temperature, distraction, human factor)

-     using suitable hardware and software

-     during a period exclusively dedicated to training course (i.e. no other activity in parallel or excessive additional working time)

Instructors should regularly check that students remain in an appropriate environment through the video and record student as absent during the training session when the conditions above are not

met.

(g) E-library
An e-library should be provided to students containing all technical material appropriate to the scope and level of training undertaken. When the students cannot physically access the library located at the training organisation, suitable documents have to be accessible online (i.e. e-library) in addition to the physical library available at the training organisation.

(h) Sampling of DSL training sessions by the CASA AME Licensing Inspector
Access to the virtual classroom has to be granted by the CASA Inspector to allow the performance of scheduled or unannounced audits. Therefore, the training organisation has to notify the assigned CASA Inspector ahead of scheduled DSL trainings. Adequate credentials have to be provided by the training organisation to the CASA Inspector either on request or on a permanent basis.

(i) Monitoring of the students' progress
Students' progress has to be monitored to ensure the training sessions learning objectives are successfully achieved.

Different means are acceptable to validate students' progress such as:

- Follow-up examinations. Such examinations are not considered as the PNG Part 141 ATO final examination. A question bank separate from the actual PNG Part 141 ATO examination has to be used
- regular electronic quiz
- Direct questioning of students at the end of class or on a regular basis during class, etc..

EM 141.57.6.2   Theoretical Training

During DSL theoretical training, virtual classroom training tool is the main training platform.

1) Number of students
The number of students in a traditional classroom cannot exceed **28 students**. When using DSL this maximum number has to be reduced as the interactivity with students is more limited than in an actual classroom.

It is recommended not to exceed **20 students** for the **theoretical part**. This number can be increased when it is demonstrated to the CASA Inspector that both students and instructors are familiar with DSL and that previous trainings were satisfactorily delivered.

The **bandwidth of the internet connection** of both the instructor and students might be an additional limiting factor to determine the maximum number of students.

2) Daily training time
The maximum number of training hours per day for the theoretical element of type training should not be more than **6 hours**.

In order to follow pedagogical and human factors principles, daily training time might need to be reduced as DSL increases the difficulty to maintain the students' attention and fatigue compared to a real classroom environment, especially when students are not familiar with DSL.

In addition, the impact of students and instructors being present in different time zones has to be taken into account.

3) Training material
The training organisation has to define the training material used for each module or ATA during DSL as well as any additional training tools. When training material differs from the one used in real

classroom training, it has to be submitted to the CASA Inspector for review and acceptance (sampling is acceptable).

4)   Additional tuition hours and/or training method

Depending on the level of detail of the topic to be taught, additional tuitions hours and/or additional training methods might be necessary when using DSL compared to a real classroom environment (e.g. level 3).

For basic training, it is recommended to consider additional hours as support tuitions hours to the already approved training to ensure that the ratio between theoretical and practical training remains as detailed in the approved course approval form. Such support hours can be adjusted to the actual needs of a student or group of students.

5)   Training schedule

Based on point 2 to 4, TNAs, training schedules and course approval form dedicated to DSL might need to be submitted to reflect virtual classroom training plan when these differ from the real classroom environment.

EM 141.57.6.3   Theoretical Examination

Formal examinations are NOT allowed using the DSL training method. Therefore, all examinations have to take place:
-    at an approved examination site
-    or under off-site procedure as per MTOE for type training organisations only

It might be necessary for the training organisation to arrange additional training hours (i.e. refresher course) or conduct knowledge tests prior to the formal examinations as these could take place after completing all theoretical part using DSL.

In that case, the security of examination has to be maintained by ensuring that:
-    the instructor in charge of the additional training is not involved in the final examination paper preparation (i.e. use of independent examiner).
-    the Part-141 examination question bank for the approved examinations is not used for intermediate knowledge test purposes

It is acceptable when all students are present at same training location (e.g. customer facility) to organise type training examination at this location when the following condition are met:

-    Use of independent invigilators which are trained and authorized by the training organization on the examination procedure and security (e.g. customer QA personnel)
-    Examination room allows to ensure the security and the integrity of the examination
-    Examination papers are available at the students' examination site shortly before the examination takes place in a sealed envelope. It is recommended to organize an electronic examination to ensure the highest level of security.
-    The master answer sheet is not sent to the remote examination location.
-    Examination is video monitored by the examiner at training facility and video recorded. The video recording is considered as part of the examination records.
-    All examination answer sheets are scanned and sent immediately after the examination by email by the invigilator to the training organization examiner. Original answer sheets have to be sent back in a sealed envelope by mail to the training organization.
-    Marking of the examination is performed by the examiner located at the training organization.
-    All examination papers have to be retrieved and sent back to the training organization in a sealed envelope. Alternatively, examination papers can de destroyed after the examination if sufficient security can be ensured, e.g. papers shredded in the examination room straight after the examination with the training organization examiner video attendance.

The following MTOE chapters have to be amended to describe the examination procedure for this specific case:

- Organisation of examination (if applicable)
- Security and preparation of examination material (if applicable)
- Preparation of examination room
- Examinations at locations not listed in the MTOE (if applicable)

EM 141.57.6.4   Practical Training

For PNG Part 141 training organisations, the use of DSL is currently allowed for <u>the practical elements of</u> <u>the type</u> <u>training</u> only.

Basic training practical training is NOT allowed using DSL as basic practical training objectives is to gain initial basic hands-on skills and competences, which cannot be achieved in a virtual class environment.

Practical training using synchronous DSL has a limited suitability and requires complementary methods to fulfil the learning objectives.

Therefore, the following limitations are required:

- the number of practical tasks taught using DSL cannot exceed **50 %** of the total number of practical tasks performed during the practical training. At least **50% of the practical tasks will be performed in an actual aircraft environment with both students and practical instructor present at the same location.** This allows the students to be exposed to the real aircraft in order to appreciate actual aircraft dimensions, components/access panel locations, etc. When several engine options are included in the same practical training, practical tasks on actual aircraft have to be included for each these engine options
- practical training using DSL has to be limited to suitable tasks which can be effectively taught in a virtual environment

Suitable tasks are practical tasks which:
- include tests/inspections performed at a limited number of aircraft location
- and/or include a limited number of maintenance steps
- and/or can be easily explained/replicated in a virtual environment
- and/or can be practiced by the students on a virtual aircraft

Virtual classroom training tool is the main training platform to present AMM, pictures, videos etc... However, live videos with an instructor being present on a real aircraft are not allowed due to the low quality of information received by the students compared to the other training tools (videos, virtual reality etc.). A combination of training tools is required to fulfil the learning objectives.

Although it is acceptable to teach practical tasks in a virtual classroom environment when the suitability is demonstrated, the choice of a virtual aircraft training tool which allows tasks simulated practice should be privileged.

During the DSL practical training session, it is necessary to:
- Clearly identify and introduce the task selected from PTR.
- Use AMM procedure (and other relevant documents) as the reference document
- Safety procedure has to be clearly highlighted.

1) Hardware requirement
   Same as theoretical part already covered above.

2) Software requirement
   Same as theoretical part already covered above.

3) Number of students

The number of students undergoing practical training cannot exceed **15 students**. When using DSL this maximum number have to be adjusted, as the interactivity with students is more limited than in an actual practical training. It is recommended not to exceed **10 students**.

4) Daily training time
Same as theoretical part already covered above.

5) Practical Training Record (PTR)-[Refer AC 66-1 Apps 4,5 and 6 for guidance on PTR]

Prior to be approved by CASA for DSL practical training, the PNG Part 141 training organisation is required to prepare and submit a PTR with a suitability analysis for each task.

The PTR should clearly indicate which tasks are taught using DSL or on real aircraft environment, as well as any associated training tools (pre-recorded videos, virtual aircraft, pictures, AMM etc.).

Practical tasks performed during DSL will have to be recorded by the instructors in the students' PTR after ensuring students have correctly understood the task.

NOTE: Practical training delivered by a PNG Type rated LAME acting as an instructor/assessor present on the aircraft with the students and guided by a practical instructor/assessor located at the training organisation is not considered as DSL training (e.g. in case of use of a PNG Type rated LAME from the customer organisation). However, a PNG Type rated LAME present on the aircraft has to be suitably authorised by the Part 145 maintenance organisation on the aircraft type to be taught. In addition, he has to be trained, assessed and authorised as a practical instructor/assessor for the duration of the practical training by the training organisation. The PNG Type rated LAME may apply for and hold a valid PNG Part 66 Subpart G- Instructor Rating and/or Part 66 Subpart F-Examiner Rating. This procedure has to be detailed in MTOE as part of the off-site training procedure.

The PNG Part 141 training organisation has to submit a request for approval of this MTOE procedure identifying a designated PNG Type rated LAME. The PNG Type rated LAME remains responsible to ensure the appropriate delivery of the **practical elements** of **type training on-site and the associated assessments, based on the directives of the Part 141 training organisation instructor**. The PTR is filled either by the PNG Type rated LAME present at the aircraft or the practical instructor at the Part 141 training organisation.

EM 141.57.6.5   DSL Practical Assessment (Skills Tests)

Practical assessment is NOT allowed using DSL training method and has to be performed when the practical training is completed with both instructors and students present **in a real aircraft environment.**

Assessment performed in an actual aircraft environment can cover both practical tasks taught using DSL and the one taught on the actual aircraft.

EM 141.57.6.6   DSL Reference Material

This AC has been adapted from the following EASA documents:

(1) Foreign   Part-147 Distance Learning Training Method User Guide, document reference UG.CAO.00169-001; and

(2) Annex IV to ED Decision 2020/002/R: Acceptable Means of Compliance (AMC) and Guidance Material (GM) to Annex IV (Part 147) to Commission (EU) No. 1321/2014, Issue 2 Amendment 2.

Appendix A   Training Procedures and Quality System

Introduction

This appendix provides some clarification for the incorporation of new training methods and training technologies in the procedures for aircraft maintenance training.

The classic training method is a teacher lecturing the pupils in a classroom. Commonly the training tools are a blackboard and training manuals. New technologies make it possible to develop new training methods and use other training tools, e.g. multimedia-based training and virtual reality.

A combination of several training methods/tools is recommended in order to increase the overall effectiveness of the training.

Simulation cannot be eligible as a sole training or assessment tool for basic hand skills such as wiring, welding, drilling, filing, wire locking, riveting, bonding or any other skill where competence may only be achievable by performing a hands-on activity.
Three tables are provided to illustrate the possibilities for the use of different training methods and tools:

        Table 1: Training tools
        Table 2: Training methods
        Table 3: Combination of training methods and tools and their use

Table 1 lists existing training tools that may be selected for basic training.

Table 1 – Training Tools

	Training Tools	Description
1	Slideshow Presentation	A structured presentation of slides
2	Manuals	Comprehensive and controlled publication of a particular topic.
3	Computer (desktop PC, laptop, etc.)	An electronic processing device that can hold and display information in various media
4	Mobile Devices (such as, but not limited tablets, smart phone, etc.)	A mobile electronic processing device that can hold and display information in various media
5	Videos	Electronic media for broadcasting moving visual images.
6	MSTD – Maintenance Simulation Training Device	A training device that is intended to be used in maintenance training, examination, and/or assessment for a component, system or entire aircraft. The MSTD may consist of hardware and software elements.
7	Mock-up	A scaled or full-size replica of a component, system or entire aircraft that preserves (i.e. Is an exact replica of) the geometrical, operational or functional characteristics of the real component, system or entire aircraft for which maintenance training is delivered with the use of such a replica.
8	Virtual Reality	A computer-generated three-dimensional (3D) environment, which can be explored and possibly interacted with.
9	MTD – Maintenance Training Device	Maintenance training device is any training device other than an MSTD used for maintenance training and/or examination and/or assessment. It may include mock-ups.
10	Real Aircraft	A suitable aircraft whose condition allows teaching a selection of maintenance tasks that are representative of the particular aircraft or of the aircraft category. 'Suitable' means an aircraft of the type or licence (sub)category (if the licence (sub)category aircraft is outfitted with the same equipment subject to the particular lesson module(s) and is sufficiently similar so that the lesson objective(s) can be

		satisfactorily accomplished) for type training, or an aircraft representative of the licence (sub)category for basic training, and excludes 'virtual aircraft'. 'Condition' means that the aircraft if equipped with its main components and that the system can be activated /operated when this is required by the learning objectives.
11	Aircraft Component	A suitable aircraft component used to teach specific maintenance tasks off-the-wing. This may include but is not limited to tasks such as borescope inspections, minor repairs, testing, or the assembly/disassembly of sub-components. 'Suitable' means that the condition of the component should fit the learning objectives of the tasks and when appropriate, may feature existing defects or damages.
12	Augmented Reality	An enhancement (modification, enrichment, alteration or manipulation) of one's current perception of reality elements of a physical, real-world environment following user's inputs picked up by sensors transferred to rapid streaming computer images. By contrast, virtual reality replaces the real world with a simulated one.
13	Embedded Training	A maintenance training function that is originally integrated into the aircraft component's design (i.e. a centralized fault display system).
14	Classroom	A physical, appropriate location where learning takes place.
15	Virtual Classroom	A simulated, not physical, location where synchronous learning takes place.
16	Virtual Aircraft	A simulated, not physical, aircraft that may be used in theoretical training, practical training, examination or assessment.
Note: Synthetic training devices (STDs) is a generic term used for systems using hardware and/or software, simulating the behaviour of one or more aircraft systems or a complete aircraft, such as maintenance simulation training devices (MSTDs), maintenance training devices (MTDs) and flight simulation training devices (FSTDs).		

Table 2 – Training Methods for Basic Training

Table 2 lists existing training methods that may be selected for basic training

Table 2: Training Methods

Training methods	Description	Instructor – Centred [1]	Student – centred [2]	Blended training [3]
Assisted Learning (mentoring)	Assisted learning or mentorship represents an ongoing, close relationship of dialogue and learning between an experienced/ knowledgeable student in order to develop experience of students.	x	x	x
Computer-Based Training (CBT)	CBT is any interactive means of structured training using a computer to deliver a content. (Note: Not to be confused with competency-based training that also uses the acronym 'CBT')	x	x	x
Demonstration	A method of teaching by example rather than explanation.	x		x

Distance Learning Asynchronous	Distance learning reflects training situations in which instructions and students are physically separated. It is asynchronous if the teacher and the students do not interact at the same time.		x	x
Distance Learning Synchronous	Distance learning reflects 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).	x		x
e-learning	Training via a network or electronic means, with or without the support of instructions (e-tutors)	x	x	x
Lecturing (instructor- led/face to face)	Practice of face-to-face delivery of training and learning material between an instructor and students, either individuals or groups.	x		x
Mobile learning (M-learning)	Any sort of learning that happens when the student is not at a fixed, predetermined location, using mobile technologies.	x	x	x
Multimedia – Based Training [4]	Any combined use of different training media.	x	x	x
Simulation	Any type of training that uses a simulator imitating a real-world process or system.	x	x	x
Web-Based Training (WBT)	Generic term for training or instruction delivered over the internet or an intranet using a web browser.	x	x	x

Note: The purpose of this table is to provide a short definition for each associated training method and to relate each method to the focus of the learning. It is not meant to comprehensively explore and identify the capabilities of each training method herein included.

(1) 'Instructor-centred' means that the instructor is responsible for teaching the student.

(2) 'Student-centred' means that the student is responsible for the learning progress.

(3) 'Blended training' includes different instructional methods and tolls, different delivery methods, different scheduling (synchronous / asynchronous) or different levels of guidance. Blended training allows the integration of a range of learning opportunities.

(4) 'Multimedia-based training' by definition uses various media to achieve its objectives, thus, none of the single media listed is per a complete solution for training.

Table 3 – Combination of Training Methods and Tools and their Use

Table 3 presents a combination of training methods and tools that may be taken into account for theoretical and practical training.

The table is intended to support potential delivery methods. Additional training methods and further use of those methods could be acceptable to the Director when demonstrated as supporting learning objectives.

Table 3: Combination of training methods and tools and their use

Training Method	Training Tools	Theoretical Elements			Practical Elements	OJT	Learning Objectives		
See Table 2	See Table 1	Level 1	Level 2	Level 3			Knowledge	Skills	Attitude
Lecturing (instructor-led / face to face)	1,2,3,5,6,7,8,9,10,11 12,13,14,16	x	x	x	x	**X** Only Type	x	x	**X(1)** Only Type
Assisted Learning (mentoring)	1,2,3,5,6,7,8,9,10,11 12,13,14,15,16	x	x	x	x	**X** Only Type	x	x	**X(1)** Only Type
e-learning	1,2,3,4,5,8,12,14, 15,16	x	x	**X(1)**	**X(1)**		x	**X(1)**	**X(1)**
Computer-Based Training	1,2,3,4,5,8,12,14 15,16	x	x	x	**X(1)**		**X** Only Type	**X(1)**	
Multimedia-Based Training	1,2,3,4,5,8,12,13, 14,15,16	x	x	x	**X(1)**		**X** Only Type	**X(1)**	**X(1)**
Web-Based training (WBT)	1,2,3,4,5,8,12,14, 15,16	x	x	**X(1)**	**X(1)**		**X** Only Type	**X(1)** Only Type	**X(1)**
M-learning	1,2,3,4,5,12,15,16	x	x	**X(1)**	**X(1)**		**X(1)** Type Unlimited	**X(1)**	
Distance Learning Synchronous	1,2,3,4,5,8,15,16	x	x	**X(1)**	**X(1)**		**X(1)** Type Unlimited	**X(1)**	**X(1)** Only Type
Distance Learning Asynchronous	1,2,3,4,5,8,16	x	x	**X(1)**			**X(1)** Type Unlimited	**X(1)**	**X(1)** Only Type
Demonstration	1,2,3,5,6,7,8,9,10, 11,12,13,14,15,16	x	x	**X(1)**	x	**X(1)** Only Type	x	x	**X(1)** Only Type
Simulation	1,3,4,6,7,8,9,10,12 14,15 (1),16	x	x	**X(1)**	x		x	x	x

This table relates a given training method to a list of acceptable training tools (code), oriented to deliver the theoretical elements, practical elements or on-the-job training associated with their specific learning objectives (1) Limited suitability. It means that the respective training method may be used but with limited results, thus, requiring the support of a complementary training method to fulfil the learning objectives.

Appendix B   Application for Approval of Aircraft Type Rating Course

Appendix B to AC 141-2	**Civil Aviation Safety Authority of Papua New Guinea** **Application – Approval of Aircraft Type Rating Training/Course**	Form PEL LWR

Aircraft Maintenance Engineer Licensing

LICENCE CATEGORY: AIRCRAFT TYPE:

DETAILS OF APPLICANT (TO BE THE AVIATION TRAINING ORANISATION, AIR OPERATOR OR MAINTENANCE ORGANISATION)

ORGANISATION NAME:

Address:

Telephone No   Email:

Ref No. Of any CASA Approval held:

NAME OF THE PNG AIR OPERATOR IF DIFFERENT FROM THE APPLICANT

PERSON(S) RESPONSIBLE FOR CO-ORDINATION OF TRAINING FUNCTIONS:

CERTIFIED THAT:

(a)   The information contained in this application is accurate and that any alterations of staff, facilities, syllabuses and procedures detailed herein will be notified to the CASA. It is agreed that employees of the CASA will have, at reasonable times, access to the facilities for the purpose of establishing that satisfactory standards are being maintained.

(b)   The training provided will meet the technical capability required for maintenance personnel using the appropriate type rated licence.

Name ....

Signature   ....

for and on behalf of ....

Date   ....

GUIDANCE NOTES

Refer to item number:

1   An external course is considered to be one that is provided by a third-party agency, even if the course is conducted on the applicant's premises.

2   Self-explanatory.

3   The syllabus must include all appropriate subjects within CAR 66 /Advisory Circular 66-1 Appendix 3 modules, which cover the category subdivisions for that type, particularly powerplants, where the training must cover airframe related systems such as airframe fuel, controls, propellers and APU where applicable.

3a   The ATA Spec 104 level (eg.1 or 3) to which the training course is conducted should be clearly stated. The evaluation must be confirmed by the quality manager.

4   Where subjects within the modules are not completely covered by the course syllabus, they must be provided by supplementary training. This may be by another course, 'in house' training, 'on the job' training or structured self-study. This additional training must be stated and will form part of the recognition. Candidates applying for a type rating will be required to have completed all training before the rating is granted.

5   The information contained within the course should be regularly reviewed and kept up to date by allowing access to current modifications and in service problems.

6   Self-explanatory.

7   Self-explanatory.

7a   Self-explanatory.

8   Self-explanatory.

9   Self-explanatory.

10 Self-explanatory.

11 The applicant is responsible for ensuring the continuing acceptability of the course in all respects, particular attention being given to syllabus coverage, accuracy of training material and effectiveness of the examination. The means by which this responsibility is reconciled should be stated. Refer to AC 66-1 Appendix 3 for syllabus coverage expectations.

12 Hands on experience reinforces classroom-based training and consideration should be given to including it as part of the overall training process, especially if it is not already part of an agency's course. Refer to AC 66-1 Appendix 4 and 5 for guidance on this.

13 Practical training shall be type specific and includes hands on training in the maintenance of aircraft, rigging, adjustments, replacement of LRU's, trouble shooting, rectification of minor defects and functional tests of systems. Refer to AC 66-1 Appendix 4 and 5 for guidance on this.

14 All courses to be recognised need to have an assessment of the standards attained during the phases and on completion of the course. This should include any additional training that takes place in respect of item 4. The action taken should a student fail a phase or final examination should be stated.

15 There should be a process of ensuring that the exams are current and relevant and are continuing to assess the students' ability with respect to the defined standard. This process should ensure that outdated or misleading questions are identified and replaced.

15a Self-explanatory.

16 A lockable container with controlled access should be use for hard copies or computer disks. Should the information be stored on a hard drive the computer should have password access, the machine being stand alone, not networked.

16a Self-explanatory.

17 Self-explanatory

18 Previous experiences as an instructor and currency on the type being taught must be taken into account. An example of evidence of satisfactory course completion, including supplementary training where appropriate, must be included with the application

19   Self-explanatory:

COURSE DESCRIPTION

TRAINING AGENT

1 **In House / External**   *Delete as appropriate*

(a) COURSE LOCATION   (b)   COMPANY NAME

ADDRESS   ADDRESS

2   COURSE DURATION (IN DAYS)   INSTRUCTIONAL HOURS

3   Has the syllabus been reviewed by the applicant and found to be appropriate to AC 66-1 and to the aircraft variants being maintained?

3a Does the training course comply with: (please tick appropriate box)

☐ATA Spec 104 level 1   ☐ATA Spec 104 level 3   ☐ Company requirements/standards

I have reviewed the course syllabus and examination and consider that they meet the above standard

Part 141 ATO Quality Manager   Signature

Name………………………………   …………………………………

4   What additional training is provided, to supplement the above training?

5   How does the training course provider keep up to date notes for the variant
        maintained by the applicant?

6   Does the course include all relevant Airworthiness Directives and Service Bulletins?

7   Are the training notes of an acceptable standard, reflecting the aircraft variant
        being taught and regularly reviewed?

7a   How are these reviews recorded?

8   Do students have access to current manuals and bulletins during the course?

9   How much access do the students have to a complete aircraft during the course?
10   Are the classroom training aids to an acceptable standard?

11   How are course standards monitored and maintained by the (training) agency and/or applicant?

12   What 'on the job' training is given during or after the course?

13   How does the course give practical training?

14   What is the format of the examinations, including pass mark and retake procedures? Is it a close book
        exam?

15   What monitoring/analysis of the examination papers and questions take place?

15a How and where is the monitoring/analysis recorded?

16   How is the security of the examination papers and student records maintained?

16a Who is the person responsible for maintaining these documents?

17   Are the training facilities/environment and examination security to an acceptable standard?

18   Have the instructional staff been determined as suitable to conduct the course?

19   If the Course is to be conducted by Distance Learning (DSL) Training Method - Does it comply with PNG AC 141-2?

A copy of the notification (Certificate) of satisfactory completion of the training must be enclosed with this application (the certificate should state the Training Agent responsible for providing the course). It will be necessary to show supplementary training where this has been required.

All successful candidates are to be issued with a certificate on completion of any recognised training course. When complete this form should be returned to:

Civil Aviation Safety Authority of Papua New Guinea, P.O.BOX 1941 Boroko, NCD, PNG.

Appendix C   Checklist for audit of DSL Training Course

<table>
<tr><td></td><td>Civil Aviation Safety Authority of PNG

DISTANCE LEARNING(DSL) TRAINING METHOD
TRAINING FACILITIES & COURSE APPROVAL
CHECKLIST / REPORT</td><td>Form

PEL

DSL</td></tr>
</table>

<table>
<tr><td colspan="2">1. DETAILS</td><td></td><td></td></tr>
<tr><td>Operator:</td><td></td><td>141.ATOC No:</td><td></td></tr>
<tr><td>Location:</td><td></td><td>Date of Inspection</td><td></td></tr>
<tr><td>Training coordinator</td><td></td><td>Assessment Time</td><td></td></tr>
<tr><td>Aircraft Type</td><td></td><td></td><td></td></tr>
</table>

Rating: S- Satisfactory   U-Unsatisfactory   NA-Not applicable   NO-Not observed

<table>
<tr><td colspan="7" align="center">TRAINING FACILITIES</td></tr>
<tr><td colspan="7">2. GENERAL REVIEW</td></tr>
<tr><td>No</td><td>Items</td><td>S</td><td>U</td><td>NA</td><td>N/O</td><td>Remarks</td></tr>
<tr><td>2.1</td><td>Training schedule (including dates and types of training are provided for)</td><td></td><td></td><td></td><td></td><td></td></tr>
<tr><td>2.2</td><td>Lesson plans for Introduction, recurrent Upgrade and transition training</td><td></td><td></td><td></td><td></td><td></td></tr>
<tr><td>2.3</td><td>Manuals – Training manual,</td><td></td><td></td><td></td><td></td><td></td></tr>
<tr><td>2.4</td><td>Examination knowledge questions and answers, including practical assessments</td><td></td><td></td><td></td><td></td><td></td></tr>
<tr><td colspan="7">3. DSL TRAINING ROOM INSPECTION</td></tr>
<tr><td>No</td><td>Items</td><td>S</td><td>U</td><td>NA</td><td>NO</td><td>Remarks</td></tr>
<tr><td>3.1</td><td>Is the Training Room large?
enough to accommodate the number of planned trainees?</td><td></td><td></td><td></td><td></td><td></td></tr>
<tr><td>3.2</td><td>Is the Training Room equipped with a white board?</td><td></td><td></td><td></td><td></td><td></td></tr>
</table>

No.	Items	S	U	NA	NO	Remarks
3.3	Is the Training Room equipped with an OHP or equivalent					
3.4	Is the Training Room equipped with a table/desk and a suitable chair for each individual?					

4. DSL TRAINING ROOM TOOLS						
No.	Items	S	U	NA	NO	Remarks
4.1	Does the room has enough computers (desktop, PC, Laptop)?					
4.2	Does the room has equipment for slide show?					
4.3	Does the room has reference materials (Aircraft manuals, structural Manuals, Students' resource materials etc.)?					
4.4	Is the room equip with mobile devices, (such as, but not limited to tablets etc.)					
4.5	Does the room has video screen for Virtual conferencing?					
4.6	Does the ATO provide a designated Virtual Classroom?.					
4.7	Does the ATO has a capability to conduct Virtual Aircraft?.					
4.8	Does the virtual classroom provide the sense of virtual reality?.					
4.9	Does the virtual classroom has video / audio and 2 way communication system for full interaction between students and instructors?.					
4.10	Does the Virtual Classroom has enough bandwidth of internet connection to provide instantaneous communication?.					
4.11	Does the designated virtual class room has enough space to accommodate the course participants?					
4.12	Has the ATO provided guidance materials for DSL training ?.					
4.13	Has the ATO carried out the assessment on the foreign training provider?					
4.14	Does the ATO has Cvs, certificates and credentials of instructors delivering the training ?					
4.15	Has the ATO appointed an assessor or instructor to facilitated the virtual training (DSL).					
4.16	In the event of interruptions, has ATO provided backup plans to provide continuity of the training.?					
4.17	Does the virtual class room has a standby screen sizeable enough to display all training material?					

| 4.18 | Does the virtual Classroom have emergency plan? | | | | | |
| 4.19 | Does ATO provide standby power, in the even where PNG Power supply get interrupted? | | | | | |

5.   DSL HARD WARE TRAINING REQUIREMENTS FOR STUDENTS

No.	Items	S	U	NA	NO	Remarks
5.1	Does the ATO issue desktop computer, laptop and tablets to each student?					
5.2	Are students equipped with headset, webcam and screen sufficient enough to view all training material?					
5.3	Are students allowed to trained from remote location?					
5.4	If yes (5.3) is the facility approved by CASA?					
5.5	Are the students internet connection and Bandwidth sufficient enough and comfortable?					
5.6						

6.   DSL HARDWARE TRAINING REQUIREMENTS FOR INSTRUCTORS

No	Items	S	U	NA	NO	Remarks
6.1	Does the ATO issue desktop computer, laptop and tablets to each DSL Instructors?					
6.2	Are Instructors equipped with headset, webcam and screen sufficient enough to view all training material?					
6.3	Are Instructors allowed to instruct from remote location?					
6.4	If yes (6.3) is the facility approved by CASA?					
6.5	Are the Instructor's internet connection and Bandwidth sufficient enough and comfortable?					

MOCK-UP APPROVALS FOR ATO DSL (VIRTUAL TRAINING)

7.   SCOPE

No	Items	S	U	NA	NO	Remarks
7.1	ATO to carry out Mock Virtual Training with the training provider.					

7.2	ATO to carry out internet Bandwidth check					
7.3	ATO to carry out orientation on using virtual classroom (i.e. raise hand, share documents, mute microphone…) etc.					
7.4	ATO computer and screen meet the minimum specification.					
7.5	ATO to provide necessary guidance material to students and make sure all students are sufficiently familiarised with meeting software.					
8.0 DSL Trainer/Instructor						
8.0	Are the Instructors trained on DSL Training?					
8.1	Do the instructors meet the Eligibility requirement of CAR Part 66.405 (a)(b)?					
8.2	Do the instructors meet the requirements of CAR Part 66.(a)(4)(i).?					
8.3	Does the Certificate of instructors Authorisation meets the requirements of Car Part 66.409?					
8.4	Are the examiners trained on DSL Training?					
8.5	Do the Examiners meet the Eligibility requirement of CAR Part 66.305 (a)(b)?					
8.6	Do the Examiners meet the requirements of CAR Part 66.305(a)(4)(i).?					
8.7	Does the Certificate of Examiners Authorisation meet the requirements of Car Part 66.409					

Any other Observation/ Remarks: ....

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....
....
....
....
....
....

Approval Granted: Yes / No

If No; Reason ....

....

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....

....

CASA INSPECTOR

Name: ....   **Signature:** ....   **Date:** ....