Annex II to ED Decision 2018/001/R

'Acceptable Means of Compliance (AMCs) and Guidance Material (GM) to Part-ORA Amendment 5'

The text of the amendment is arranged to show deleted text, new or amended text as shown below:

(a)   deleted text is struck through;

(b)   new or amended text is highlighted in grey;

(c)   an ellipsis '[…]' indicates that the rest of the text is unchanged.

1.   AMC1 ORA.ATO.230(a) 'Training manual and operations manual' is amended as follows:

'**AMC1 ORA.ATO.230(a)   Training manual and operations manual**

TRAINING MANUAL

Training manuals for use at an ATO conducting to conduct integrated or modular flight training courses should include the following:

(a) The training plan:

[…]

(9) Assessments, tests and examinations	(i) Flying: 　　(A) progress checks; 　　(B) skill tests. (ii) Theoretical knowledge: 　　(A) progress tests; 　　(B) theoretical knowledge examinations; 　　(C) Area 100 KSA assessments. (iii) Authorisation for test; (iv) Rules concerning refresher training before retest; (v) Test and assessment reports and records; (vi) Procedures for examination paper preparation, type of question and assessment, standard required for 'pass'; (vii) Procedure for question analysis and review and for raising replacement papers; (viii) Examination resit procedures.

[…]

(d)   Theoretical knowledge instruction

[…]

(6) Review procedure	[…]
(7) Appendices	(i) Examples of Area 100 KSA summative assessments;
	(ii) Area 100 KSA mental maths test example.'

2. New AMC2 to ORA.ATO.230(a) 'Training manual and operations manual' is inserted:

'**AMC2 ORA.ATO.230(a) Training manual and operations manual**

THEORETICAL KNOWLEDGE COURSE DESIGN REQUIREMENTS

An ATO that delivers theoretical knowledge instruction for professional pilot licences should ensure that:

(a) the courses are designed and developed using the instructional systems design (ISD) methodology, which is supported by a robust and effective management system;

(b) the courses include a standardised and dynamic assessment and testing system;

(c) instructors that deliver KSA instruction have received appropriate training covering at least learning styles, teaching methods, facilitation techniques, threat and error management (TEM), the applicable competencies, and the content of the subject(s) and exercises that they are to deliver;

(d) the recurrent training of instructors is conducted at least annually;

(e) the instructors that are responsible for assessing Area 100 KSA have received appropriate training regarding the assessment(s) that they are to conduct, and are to be standardised to ensure that the assessment grades awarded are consistent across the ATO; this standardisation should include at least familiarisation with the performance indicators, the ATO's word pictures for grading, and the ATO's debriefing system; and

(f) recurrent standardisation training is conducted at least annually to ensure continued inter-rater reliability.'

3. New AMC3 to ORA.ATO.230(a) 'Training manual and operations manual' is inserted:

'**AMC3 ORA.ATO.230(a) Training manual and operations manual**

AREA KSA 100 02 AND 100 03 LEARNING OBJECTIVES, ASSESSMENTS AND RECORDS

(a) An ATO that delivers theoretical knowledge instruction for professional pilot licences should ensure that for the learning objectives (LOs) in topics 100 02 and 100 03 of Area 100 KSA there are at least two summative assessments and at least one formative assessment. The summative assessments are to be documented in the student's training records. Both the summative assessments and the formative assessment(s) should be debriefed.

(b) The formative assessment(s) should:

(1) be designed such that the student has the opportunity to ask questions and develop competencies in most of the LOs in 100 02 and 100 03 of Area 100 KSA;

(2) be conducted during the training; the ATO may in addition conduct a formative evaluation (continuous assessment) over a specified phase of the course; and

(3) be conducted by an instructor that is trained to deliver the formative assessment.

(c) The summative assessments should:

(1)   be designed so that they collectively give the student the opportunity to demonstrate competency in all LOs in 100 02 and 100 03 of Area 100 KSA; each individual summative assessment may address some of the LOs in 100 02 and 100 03 of Area 100 KSA;

(2)   be satisfactorily completed before the student is recommended by the ATO for their first attempt to take the final theoretical knowledge examination paper, and the outcome of the assessments should be included in the student's training record;

(3)   require that for a student to be considered that they have achieved a 'Satisfactory' standard, they:

  (i)   meet at least 35 % (which defines the term 'some' used in the word pictures) of the indicators relevant to the assessment exercise, in each competency;

  (ii)   have an overall positive effect on the outcome or completion of the exercise without any external input from the instructor, or where the assessment requires the instructor to facilitate the exercise, without the instructor providing any knowledge or corrective input to assist in the completion of the exercise; and

(4)   be conducted by an instructor that is trained to deliver the summative assessments.

(d)   The training manual should include the following elements regarding the theoretical knowledge training and assessment of the LOs in topics 100 02 and 100 03 of Area 100 KSA:

(1)   the positions, or range of positions, of the formative assessment exercise(s) and summative assessment exercises in the training programme;

(2)   a description of the summative assessments, including a matrix that shows which Area 100 KSA LOs are covered in each exercise;

(3)   the grading system of the Area 100 KSA summative assessment and a description of the ATO's minimum required standard;

(4)   the template for the information about Area 100 KSA to be included in the student's training record, which should include at least the dates and result ('Pass' or 'Fail') of the summative assessments and the date and score of the mental maths test;

(5)   the method of assessment debrief for each summative and formative assessment;

(6)   for a student who performs below the satisfactory standard in a summative assessment(s), the method to further develop the student's competencies and how to conduct the reassessment.

(e)   Access to the information on Area 100 KSA kept in the student's training records should be restricted to the student and authorised ATO personnel, and should not be disclosed outside the ATO. The information on the record should first be de-identified before it is used to support course design improvements.'

4.   New AMC4 to ORA.ATO.230(a) 'Training manual and operations manual' is inserted:

'AMC4 ORA.ATO.230(a)   Training manual and operations manual
AREA 100 04 LEARNING OBJECTIVES: MENTAL MATHS TEST AND RECORDS

(a)   An ATO that delivers theoretical knowledge instruction for professional pilot licences should ensure that at least one KSA mental maths test is conducted and the outcome(s) documented in the student's training records.

(b)   The mental maths test(s) may be written or oral in format and should, where possible, be scenario-based, with at least two questions per LO in topic 100 04 of Area 100 KSA.

(c)   The minimum score to pass the Area 100 KSA mental maths test(s) should be 75 % of the marks allocated to a test. However, a higher pass mark may be defined by the ATO.

(d)   The mental maths test(s) should be satisfactorily completed before the student is recommended by the ATO for their first attempt to take their final theoretical knowledge examination paper.'

5.   New GM1 ORA.ATO.230(a) 'Training manual and operations manual' is inserted:

'**GM1 ORA.ATO.230(a)   Training manual and operations manual**

ASSESSMENT OF STUDENTS IN AREA 100 KSA

(a)   The Area 100 KSA formative assessment(s) and summative assessments may include but not be limited to: written planning exercises combining multiple subjects; practical exercises using training devices (if available); scenario-based oral board (viva voce); scenario-based communications exercises; written assignments or project work; and preparation and delivery of group or individual presentations.

(b)   The format of formative and summative assessment debriefs should be effective, highlighting the student's strengths and weaknesses and enabling future improvement.'

6.   New GM2 ORA.ATO.230(a) 'Training manual and operations manual' is inserted:

'**GM2 ORA.ATO.230(a)   Training manual and operations manual**

AREA 100 KSA WORD PICTURES

(a)   'Word pictures' are a proven assessment tool that standardises pilot core competencies, and can be used to assess student's competency in the Area 100 KSA LOs in topics 100 02 and 100 03. Word pictures describe the student's performance. Each word picture is associated with a numerical grade; within the range of grades, the minimum acceptable standard is defined. Additionally, a word picture describing performance that falls below the minimum satisfactory standard should be included in the range, as well as additional word pictures that relate to grades which exceed this minimum satisfactory standard.

Word pictures enable the standardisation of the assessment performance and facilitate inter-rater reliability within an ATO.

(b)   This GM provides two examples of word pictures.

(c)   The most commonly used word pictures are shown in Section A below. They are based on performance indicators, which explain what the student should demonstrate in order to attain the specific Area 100 KSA LOs that are addressed by the assessment exercise. Word pictures are formed of elements that contain the following:

(1)   HOW MANY of the performance indicators were observed and, where relevant, HOW OFTEN;

(2)   HOW WELL the competency was demonstrated in the assessment exercise to have an overall positive effect on the outcome or completion of the assessment exercise;

(3)   the level of success in the OUTCOME of the assessment exercise.

(d)   An ATO could establish its own set of word picture descriptions as long as they are comparable in the grading of each competency, similar to the 'Communication' and 'Application of knowledge, UPRT and resilience' word pictures example in Section B below.

(e)   The advantage of word pictures is that they provide meaningful and standard data to enable identification of individual, crew, class, instructor and ATO trends, which can be analysed in order to provide feedback for further improvement or development.

(f)   An ATO should ensure that the detailed information obtained through its grading in Area 100 KSA is de-identified before using it to support course improvement.

SECTION A — EXAMPLE 1

AREA 100 KSA WORD PICTURE GRADE LEVELS (USING INDICATORS)

(g)   The example shown below in this Section contains the most commonly used word pictures, which are formed of elements that contain the following:

   (1)   HOW MANY of the performance indicators in the table further below relevant to that summative assessment were observed in that competency (as a percentage);

   (2)   HOW WELL the competency was demonstrated in the assessment; and

   (3)   the level of success in the OUTCOME of the summative assessment.

(h)   In order to satisfactorily complete an Area KSA 100 summative assessment, the student should reach at least the minimum satisfactory level in each competency covered by that assessment. In case the student fails to reach the minimum satisfactory level in each competency, the student should repeat the summative assessment or another summative assessment that covers the competency(ies) where performance was previously assessed as unsatisfactory.

Table 1: Example generic competency framework that can be applied for assessing the student's level of performance

Competency	Level 1 Unsatisfactory	Level 2 Satisfactory	Level 3 Good	Level 4 Very good	Level 5 Excellent
General description of each competency level. To be applied to each individual competency in LOs 100 02 and 100 03 of Area 100 KSA.	The student's performance in this competency was ineffective or inadequate, which in relation to this competency had a neutral or negative effect on others or on the outcome of the exercise. The student showed none or few of the relevant performance indicators in this competency.	The student's performance in this competency was satisfactory, which had a slightly positive effect on the satisfactory outcome of the exercise, and in group situations had a slightly positive effect on others. The student showed at least some* of the relevant performance indicators in this competency.	The student's performance in this competency was effective, which in the case of an exercise where the student is the only participant, significantly contributed to a good outcome. In group situations, the student's contribution had a good effect on others and significantly contributed to the overall outcome of the exercise. The student showed most of the relevant performance indicators to a good standard.	The student's performance in this competency was highly effective, which in the case of an exercise where the student is the only participant, significantly enhanced the very good outcome. In group situations, the student's contribution had a very good effect on others and significantly enhanced the overall outcome of the exercise. The student showed most or all of the relevant performance indicators to a very good standard.	The student's performance in this competency was exemplary, which in the case of an exercise where the student is the only participant, had an outstanding effect on the excellent outcome of the exercise. In group situations, the student's contribution had an excellent effect on others and had an outstanding effect on the overall outcome of the exercise. The student showed all of the relevant performance indicators to an excellent standard.
* 'Some' is defined as showing at least 35 % of the performance indicators in that competency, which were relevant to that exercise.					

AREA 100 KSA ASSESSMENT PERFORMANCE INDICATORS

(i)   The performance indicators that relate to the LOs in topics 100 02 and 100 03 of Area 100 KSA can be used to form a word picture.

Table 2: Performance indicators relevant to the LOs in topics 100 02 to 100 03 of Area 100 KSA

Competency	Competency description	Indicators
Communication	Demonstrates effective oral, non-verbal and written communication skills in classroom exercise and assessment situations.	— Ensures the recipient is ready and prepared to receive the information. — Selects appropriately what, when, how and with whom to communicate. — Conveys messages clearly, accurately and concisely. — Confirms that the recipient correctly understands important information. — Listens actively and demonstrates understanding of the information they receive. — Asks relevant and effective questions. — Adheres to standard radio-telephony phraseology. — Accurately reads, interprets, constructs and responds to given documentation in English. — Correctly interprets non-verbal communication. — Uses eye contact, body language and gestures that are consistent with and support verbal messages.
Leadership and teamwork	Displays effective leadership and teamwork.	— Creates an atmosphere of open communication and encourages team participation. — Uses initiative and gives directions when required. — Admits mistakes and takes responsibility. — Anticipates and responds appropriately to others' needs. — Carries out instructions when directed. — Communicates relevant concerns and intentions. — Gives and receives feedback constructively. — Demonstrates empathy and shows respect and tolerance for others. — Engages others in planning and allocates activities fairly and appropriately according to abilities. — Addresses and resolves conflicts and disagreements in a constructive manner. — Projects self-control.

Problem-solving and decision-making	Accurately identifies risks and resolves problems. Uses the appropriate decision-making processes.	— Seeks accurate and adequate information from appropriate sources. — Identifies and verifies what and why things have gone wrong. — Employs proper problem-solving strategies. — Perseveres in working through problems. — Uses appropriate decision-making processes in a timely manner. — Sets priorities appropriately. — Identifies and considers options effectively. — Monitors, reviews, and adapts decisions as required. — Identifies and manages risks effectively.
Situation awareness	Perceives and comprehends all the relevant information available, anticipates what could happen that could affect the exercise or situations discussed in the classroom, and gives effective solutions to resolve the situation.	— Identifies and assesses accurately the general environment as it may affect the operation. — Identifies and manages threats, errors, and undesirable aircraft states.
Workload management	Manages available resources or time to efficiently prioritise and complete or perform tasks in a timely manner.	— Maintains self-control. — Plans, prioritises and schedules tasks effectively. — Manages time efficiently when carrying out tasks. — Offers and accepts assistance, delegates when necessary, and asks for help early. — Manages and recovers from interruptions, distractions, variations, and failures effectively.
Application of knowledge, UPRT and resilience	Demonstrates correct and deep understanding of the subject(s), and is able to effectively relate this knowledge between subjects and apply the knowledge for effective threat and error management (TEM).	— Correctly completes pre-flight planning in the practical exercise. — Demonstrates KSA and TEM relating to phases of flight in the ground training environment. — Correctly and effectively applies knowledge to identify and manage threats and errors that could lead to a potential upset in scenario situations. — Recognises potential upset 'threats' and suggests effective 'threat management' in scenario situations. — Recognises potential upset 'errors' and suggests effective 'error management' in scenario situations.

		— Identifies the causes of and contributing factors to upsets in aircraft accident and incident reviews and in reported recovered situations or scenarios.
		— Is resilient, i.e. recognises and adapts to disruptions during scenarios and other exercises.
		— Identifies the signs of stress and discusses the effects of stress, fatigue and aviation lifestyle on situation awareness, including how to cope with these in order to maintain situation awareness.

SECTION B — EXAMPLE 2

AREA 100 KSA WORD PICTURES (USING DESCRIPTIONS)

(j)   An ATO may devise its own word pictures for each of the competencies, to be used alongside or combined with those given in EXAMPLE 1. A descriptive word picture typically includes descriptive examples that the ATO's instructors could readily identify and then equate to given competency levels. Below are two examples (for 'Communication' and 'Application of knowledge, UPRT and resilience').

Table 3: Example word pictures using descriptions

Competency	Level 1 Unsatisfactory	Level 2 Satisfactory	Level 3 Good	Level 4 Very good	Level 5 Excellent
Communication	The student's performance in communication had a neutral or negative effect on the exercise or situation. The student may not have contributed to the exercise or the communication was unclear or insufficient. The student may have occasionally interrupted others, not listened, or showed frustration or inappropriate non-objective communication. The student may have asked unrelated or	The student's written or oral communication was sufficient to convey the intent of the exercise. In oral communication the listener may have rarely needed to ask for clarification which the student then positively and clearly provided. The student listened to instructions but may have occasionally been reticent and hesitant to ask questions or make comments. The student may have rarely shown underconfidence or passiveness during the exercise. However,	The student's written or oral communication was good. Explanations, discussions, directions and comments were well-structured and clear. The student listened to others actively and when unsure asked appropriate questions to seek clarification. The student showed appropriate confidence and open body language.	The student's written or oral communication was consistently very good. All communication was clear, concise and well-structured, which ensured a very effective outcome. In group situations, the student's ability to interpret others' body language, and the use of body language to ensure a positive outcome, was very effective. At all times the student was calm, engaged and	The student's communication skills were exemplary. At all times the student observed others and ensured that their own communication was extremely effective. In group situations, the student's communication enabled all members to contribute to their greatest ability whilst also ensuring an excellent outcome of the exercise. In group situations, when appropriate, the student

				confident.	proactively and subtly managed the group's mood or motivated the group members appropriately.
	unclear questions, or provided insufficient clarity in directions or comments for others to understand. The student may have written without structure or clarity.	overall their communication was sufficient to ensure a positive outcome of the exercise.			
Competency	**Level 1** **Unsatisfactory**	**Level 2** **Satisfactory**	**Level 3** **Good**	**Level 4** **Very good**	**Level 5** **Excellent**
Application of knowledge, UPRT and resilience	The student's knowledge was at times insufficient or incorrect, which had an adverse effect on the exercise. The student displayed limited ability to relate knowledge between subjects or to apply knowledge to scenarios, exercises or in answers to questions.	The student had the minimum acceptable level of knowledge to complete the exercise to a satisfactory standard. The student occasionally demonstrated the ability to relate knowledge between subjects. The student could identify some threats or errors, and when presented with a threat or error could in most situations suggest at least one possible effective method of mitigation.	The student demonstrated a good level of knowledge with the ability to relate this knowledge effectively between subjects and in scenario exercises or situations. The student identified many threats and errors, and when presented with threats or errors used their knowledge effectively to suggest appropriate mitigations and actions.	The student demonstrated a very good level of knowledge, and correctly and readily related this knowledge across subjects and in scenario situations. The student identified most threats and errors, and immediately used their knowledge to manage them effectively.	The student had an excellent level of understanding which they immediately and appropriately applied across subjects and to the exercise or scenario situation. The student identified all actual threats and errors in scenario situations, anticipated some possible threats and errors (what if's), and used their knowledge to manage them efficiently and very effectively.'

7.   **New GM3 ORA.ATO.230(a) 'Training manual and operations manual' is inserted:**

'**GM3 ORA.ATO.230(a)   Training manual and operations manual**

AREA 100 KSA EXERCISES AND ASSESSMENTS

Exercises and assessments are to be interwoven into the theoretical knowledge training, utilising a range of learning styles; they should address subject or cross-subject topics, with the application of threat and error management (TEM) and, where possible, be scenario-based. The exercises and assessments do not need to be confined to a classroom.

(a)   Area 100 KSA exercises may be of short duration within a lesson, and the student's performance in the exercises does not need to be recorded, although the main subject and KSA learning points are likely to be discussed (or for distance learning, reviewed) within a post exercise debrief or lesson summary. To allow for flexibility and development, the exercises do not need to be specified in the training plan.

(b)   When a single formative assessment is specified in the training plan, it is likely to be extensive as it will cover many of the LOs in Area KSA 100 02 and 100 03. Alternatively, an ATO may specify a number of shorter-duration formative assessments that each covers a narrower range of LOs, and these may build in terms of content difficulty.

(c)   The exercises and formative and summative assessments may include but not be limited to: scenario planning exercises combining multiple subjects; practical exercises using training devices (where available); oral communication exercises; written assignments and/or project work; discussions; the preparation and delivery of group or individual presentations and discussions; and enable scenario-based content and individual, pair or group situation(s).

(d)   The type of assessment and the environment should be recorded in the ATO's training plan.'

8.   **New GM4 ORA.ATO.230(a) 'Training manual and operations manual' is inserted:**

'**GM4 ORA.ATO.230(a)   Training manual and operations manual**

AREA 100 KSA INSTRUCTION AND ASSESSMENT TRAINING

(a)   The following material has been developed to provide additional guidance to organisations to help them develop an effective KSA 100 instruction and assessment training programme that satisfies the provisions in AMC2 ORA.ATO.230 (c) to (f).

(b)   An ATO should ensure that an instructor who conducts the Area 100 KSA formative assessment(s) has received adequate training to be familiar with the:

(1)   relevant competencies and performance indicators;

(2)   Area 100 KSA Learning Objectives (LOs);

(3)   formative assessment(s) that they will conduct including: the applicable LOs, purpose and content of the assessment(s) and position(s) in the training plan, assessment resources, assessment environment;

(4)   Area 100 KSA grading system, including familiarisation with the performance indicators and the ATO's word pictures; and

(5)   student debrief methods and procedure.

(c)   An ATO should ensure that an instructor who conducts the Area 100 KSA summative assessments has received adequate training to be familiar with:
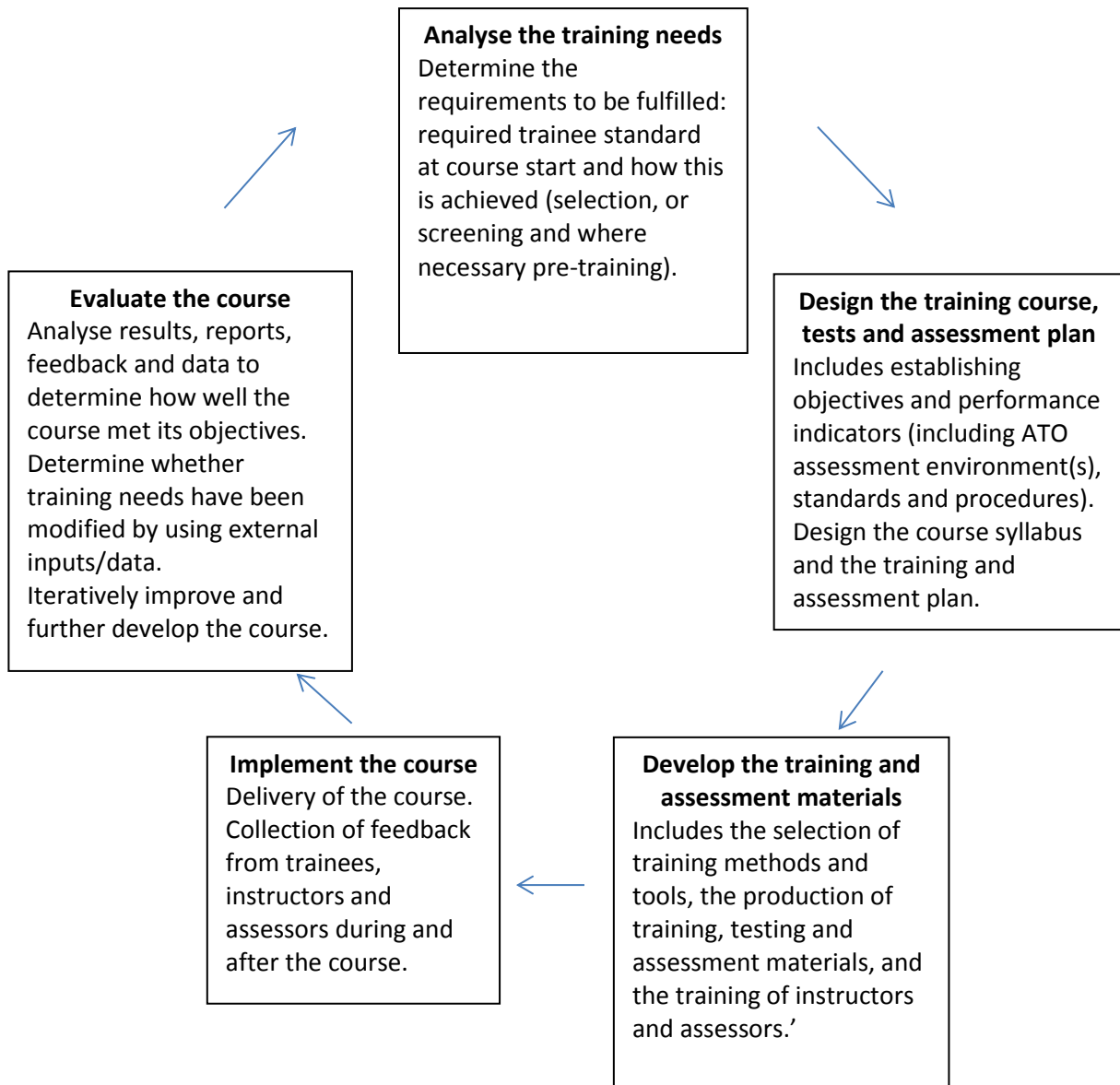
      (1)   the summative assessments that they will conduct including: the applicable LOs, purpose and content of the exercise(s) and position(s) in the training plan, assessment resources, assessment environment, and the minimum acceptable level;

      (2)   the assessment feedback, evaluation and development process; and

      (3)   KSA candidate appeal procedure.

(d)   An Area 100 KSA instruction and assessment course should include practical training on the conduct of an assessment, including grading to achieve inter-rater reliability, and the debrief under supervision.'

9.   New GM5 ORA.ATO.230(a) 'Training manual and operations manual' is inserted:

'**GM5 ORA.ATO.230(a) Training manual and operations manual**

INSTRUCTIONAL SYSTEMS DESIGN

(a)   The instructional systems design (ISD) provides a systematic and iterative process for course design based on educational best practices. There are several effective ISD models in use today, with the analyse, design, develop, implement and evaluate (ADDIE) framework being generic to all.

      The purpose of using ISD to design training courses is to facilitate the students' efficient and effective acquisition of knowledge and skills based on current training needs.

(b)   To provide evidence of the effective use of the ISD methodology in the design and continued development of their course(s), an ATO may use documentation and records that relate to the ISD phases.

(d)   ADDIE model example. The 'analysis', 'design', 'development', 'implementation' and 'evaluation' phases of the ADDIE model are shown below with brief phase descriptions.

Analyse the training needs
Determine the requirements to be fulfilled: required trainee standard at course start and how this is achieved (selection, or screening and where necessary pre-training).

Evaluate the course
Analyse results, reports, feedback and data to determine how well the course met its objectives. Determine whether training needs have been modified by using external inputs/data.
Iteratively improve and further develop the course.

Design the training course, tests and assessment plan
Includes establishing objectives and performance indicators (including ATO assessment environment(s), standards and procedures). Design the course syllabus and the training and assessment plan.

Implement the course
Delivery of the course. Collection of feedback from trainees, instructors and assessors during and after the course.

Develop the training and assessment materials
Includes the selection of training methods and tools, the production of training, testing and assessment materials, and the training of instructors and assessors.'

10.   AMC1 ORA.ATO.300 'General' is amended as follows:

'**AMC1 ORA.ATO.300 General**
DISTANCE LEARNING

[…]

(c)   Where an assessment (e.g. planning, written, scenario or practical exercise, or other assessment) is conducted outside the classroom via distance learning, the ATO should have a procedure or process in place to establish that the student themselves have completed the assessment and that the assessment method(s) for that particular exercise has (have) been effective.'