

EASA Part 147 PREPARATION OF COURSE MATERIAL Training Needs Analysis (TNA) Guidance

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The training needs analysis assesses the gap between the knowledge and skills the trainee possesses and the knowledge and skills they require, enabling them to perform safe maintenance in an aircraft.

The TNA also justifies the content and duration of each course based on the course learning objectives.

The Training Manager is responsible for the compilation, preparation and updating of the organization's approved courses TNAs.

In order to satisfy this responsibility, the Training Manager may use/require the specialized human capabilities (Subject Matter Experts) within the organization (theoretical instructors, practical instructors, assessors) or outsource specialized personnel, education specialists, maintenance organizations etc.

The training needs analysis is supported by the following basic considerations:

- An audience up to 28 participants for any theoretical training
- An audience up to 15 participants for any practical training
- All participants are considered to be aircraft maintenance licensed individuals, with minimum or no experience in the type
- Participants have a basic English language proficiency level (read/write/speak)
- Training delivery is based on an Instructor-Led-Training (ILT) and Lecturing is the preferred teaching method for theoretical trainings. When other teaching methods are used, they will be clearly documented in the respective TNA
- Practical guided demonstrations (witnessing) and supervised practical activities (performing, learning by doing) is the preferred training methodology for practical training. When other methods or resources are used, they will be clearly
- Documented in the respective TNA

The organization's Training Needs Analysis (TNA), groups the theoretical and practical elements of a course in a single document.

This training needs analysis:

a. Identifies the areas or elements where there is a need for training. Each ATA Section is broken down to sub-ATA level.

An exhaustive review of the Aircraft Maintenance Manuals Parts I and II allows the organization to identify areas where training is required in accordance with the following criteria:

1. Level of training required in PART-66 appendix III and its corresponding objectives
2. System complexity, on its own or as compared to the same system on similar aircrafts of similar operational characteristics
3. Relevance
4. Interfaces with other systems
5. Novelty
6. Maintenance practices, servicing, testing, diagnosis tools
7. Identifies the practical tasks that should be included in the practical elements part of the course, in accordance with Part 66 appendix III (Practical Training Tasks) and complying with the minimum 50% of the crossed items per ATA

Consequently, it also identifies which areas within a system are required to be taught. These areas are summarized as:

- System description and operation
- System components (location, description, operation)
- System controls & indications
- System maintenance practices, deactivation/reactivation, servicing, testing, diagnosis
- Trouble shooting if applicable or required

The Aircraft Maintenance Manual constitutes the prime reference document for the analysis, either for theoretical or practical elements of the course.

Component Maintenance Manuals (if available for the aircraft type) can also be used to assist on the analysis, especially when system components require further description and the related information is not available in the AMM.

The following documents can be used as a supplement source of information for analysis: FAA and EASA AD's, should be taken into consideration especially those having resulted in significant changes to the aircraft design, operation and maintenance, if such changes have not already been included in the respective AMM. Where necessary, especially for control, indications, and operation areas of training the Aircraft Operation Manual (AOM) should be used as a true reference data.

b. Defines the learning objectives per training level.

c. Determines which information is required to be included in the course training materials and to which level taking (a) and (b) above as guidance.

d. Estimates course duration.

Theoretical courses duration is a product of the summation of the individual subject tuition times.

Individual subject tuition times are determined based on:

- Amount of training material collected and required to fulfil the learning objectives per subject (ATA, sub-ATA)
- Difficulty of the subject being taught; determined by comparison with similar systems on other aircraft models and/or the organization's actual experience teaching the subject
- Novelty (new concepts or technology included in the particular system)
- Comparison with the course average duration time for similar courses on similar aircrafts, among EASA approved training organizations
- Availability/use of supplemental training aids such as Computer Based Training Software, Computer Based Simulation Software, Flight Simulators, Fixed Based Trainers, etc
- Actual experience teaching the subject

For practical courses, the training duration is calculated based on the following criteria:

- Number of practical tasks selected per subject
- Complexity of the selected tasks
- Compliance with the minimum duration requirements stated in the AMC to Part 66 Appendix III

e. Compares the calculated course duration (Tuition time) with that minimum recommended by EASA

f. Provides the grounds for syllabus compilation

The theoretical elements syllabus summarizes the course content and organizes the training in a logical and chronological sequence of teaching subjects.

Syllabus is created with the following criteria in mind:

- A training day must not contain more than 6 tuition hours and should exclude examinations and break periods
- A training hour is defined as a 60-minute teaching period

There is a course syllabus per approved course. The Syllabus is consolidated using a common format for all the aircraft types, it is segregated in

- Training days
- Specifies the ATA Section (Subject)
- Tuition Time per subject
- The training level and the minimum number of examination questions expected to be in the phase examination
- MTOE Part 4 should contain a sample of each approved course syllabus

The practical elements syllabus summarizes the course content per ATA Section and provides an estimated completion time per subject (ATA)

g. Defines the teaching method (both for theoretical and practical elements of the training) and which training/teaching resources are available per subject on that particular aircraft type.

h. Lists the relevant practical tasks selected for each particular Section and sub-Section

Practical tasks corresponding to each ATA Section are selected based on the following criteria:

- They complement the theoretical elements of the training in terms of operation, function, installation, key maintenance and safety significance
- They are relevant and representative of the maintenance requirements for that particular system i.e. criticality of the task or system function

- They include components/systems unique to the type or installation (i.e. ATA 42, ATA 45, ATA 46, ATA 47, etc.)
- They are sufficient in quantity (not less than 50% of the crossed tasks per ATA presented in PART 66 Appendix III)
- They include human factors and safety
- Incorporate new technologies
- Refer to a specific location

These tasks are collected and further expanded in the practical logbooks per aircraft type and course discipline.

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