



## Foreign Part-145 approvals – NDT qualification

### UG.CAO.0161-001

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**DOCUMENT CONTROL SHEET****Reference documents****a) Contextual documents**

Commission Implementing Regulation (EU) 2019/2153 - Commission Implementing Regulation (EU) 2019/2153 of 16 December 2019 - on the fees and charges levied by the European Union Aviation Safety Agency, and repealing Regulation (EU) No 319/2014.

Commission Regulation (EU) 1321/2014 - Commission Regulation (EU) of 26 November 2014 on the continuing airworthiness of aircraft and aeronautical products, parts and appliances, and on the approval of organisations and personnel involved in these tasks

ED Decision 2015/029/R - ED Decision 2015/029/R of 17 December 2015 issuing acceptable means of compliance and guidance material to Part-M, Part-145, Part-66 and Part-147 of Regulation (EU) N°1321/2014 and repealing Decision 2003/19/RM of the ED of the Agency of 28 November 2003.

MB Decision 01-2017 - Decision of the Management Board of 13 June 2017 repealing MB Decision 01-2011 on guidelines for the allocation of certification tasks to National Aviation Authorities and Qualified Entities

Regulation (EU) 2018/1139 - Regulation (EU) 2018/1139 of the European Parliament and of the Council of 4 July 2018 on common rules in the field of civil aviation and establishing a European Union Aviation Safety Agency, and amending Regulations (EC) No 2111/2005, (EC) No 1008/2008.

EN4179:2017 Aerospace series- Qualification and approval of personnel for non-destructive testing

**b) Internal documents**

UG.CAO.00024 - User guide for maintenance organisation exposition

UG.CAO.00126 - Components, engines and APU certifying staff

WI.CAO.00115 - Management Personnel & EASA Form 4 Instructions

UG.CAO.00128 - Demonstration of 6/24 months maintenance experience

**c) Aerospace NDT Boards Forum documents**

ANDTBF\_06 latest issue - Guidance training course outlines

ANDTBF\_10 latest issue - General Knowledge of other methods

ANDTBF\_12 latest issue- Proposal for annual maintenance assessment

ANDTBF action table and reference 07/2018 draft\_06: GW date: 27. Sept. 2019 (included in appendix 5 of this UG)

ANDTBF\_02 latest issue- Aerospace NDT board forum members and representatives

**Log of issues**

Issue	Issue date	Change description
001	23/09/202	First issue.





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## 0. Introduction.





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**0.2. Definitions and abbreviations.**

Abbreviations	
ANDTBF	AEROSPACE NDT BOARD FORUM
AMC	ACCEPTABLE MEANS OF COMPLIANCE
AMO	APPROVED MAINTENANCE ORGANISATION
AMTO	APPROVED MAINTENANCE TRAINING ORGANISATION
AOG	AIRCRAFT ON GROUND
CAO	CONTINUING AIRWORTHINESS ORGANISATION
CAP	CORRECTIVE ACTION PLAN
C/S	CERTIFYING STAFF
CC/S	COMPONENT CERTIFYING STAFF
EASA	EUROPEAN UNION AVIATION SAFETY AGENCY
EU	EUROPEAN UNION
GM	GUIDANCE MATERIAL
IORS	INTERNAL OCCURENCE REPORTING SYSTEM
L1	LEVEL 1
L2	LEVEL 2
L3	LEVEL 3
MOA	MAINTENANCE ORGANISATION APPROVAL
MOAP	MAINTENANCE ORGANISATION APPROVAL PROCEDURES
MOC	MAINTENANCE OVERSIGHT COORDINATOR
MOE	MAINTENANCE ORGANISATION EXPOSITION
MOR	MANDATORY OCCURRENCE REPORTING
NAA	NATIONAL AVIATION AUTHORITY
NDT	NON DESTRUCTIVE TESTING
NDTWP	NDT WRITTEN PRACTICE
OEM	ORIGINAL EQUIPMENT MANUFACTURER
PPB	PRINCIPAL PLACE OF BUSINESS
RL3	RESPONSIBLE LEVEL 3
S/S	SUPPORT STAFF
STCH	SUPPLEMENTAL TYPE CERTIFICATE HOLDER
TCH	TYPE CERTIFICATE HOLDER
WH	WORKING HOURS
WHOC	WORKING HOURS EASA OVERSIGHT COORDINATOR





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**0.3. Scope and applicability**

EASA is the Competent Authority for maintenance organisations having their principal place of business located outside the EU, as established by EASA Part 145.1 “General” and is therefore responsible for the final approval of these maintenance organisations and for establishing procedures detailing how EASA Part-145 applications and approvals are managed.

This user guide is applicable to EASA Part-145 applicant and EASA Part-145 approved maintenance organisations (hereafter referred as AMOs) having their principal place of business located outside the EU Member States and which are not certified under the provisions of a bilateral agreement signed with the EU.

The provisions of this user guide are complementary to the requirements of Part-145 regulation “as amended” and does not supersede or replace the associated regulatory requirements.

**0.4. Purpose**

This user guide is designed to be used by AMOs and the assigned inspector when

1. The maintenance organisation is defining the processes and procedures related to:
  - qualification and certification of personnel performing NDT, personnel directly responsible for the technical adequacy of the NDT methods used, who approve NDT procedures and/or work instructions, or who provide technical NDT support or training
  - issue of an authorization to personnel to sign-off NDT tasks
  - issue of certifying staff authorization to NDT certifying staff under D1 rating
2. Assigned inspector is :
  - evaluating by sampling the compliance of the AMO with Part-145 and the implementation of EN4179.

**0.5. Entry into force**

The qualification and certification requirements in this UG apply as follows:

Date	Organisation
From the date of publication	It applies to: <ul style="list-style-type: none"> <li>any organization applying for an initial EASA approval including NDT on the scope of work;</li> <li>any Part-145 organisation not approved for NDT and applying to extend the scope of work to include NDT (under D1 rating or under the existing scope of approval);</li> </ul>
From 1 <sup>st</sup> January 2023	This UG applies to all approved Part-145 organisations for the qualification, certification and recertification of all NDT staff.

**0.6. Associated instructions**

EASA has developed associated instructions (user guides, Forms, templates and work instructions), that detail specific matters, which have to be considered as an integral part of this user guide.

A complete listing of these documents, together with their applicability to the maintenance organisation or NAA / QE / EASA, is addressed in the current revision of the “Foreign Part-145 approvals – documentation Index”, FO.CAO.00136-XXX (XXX identifies the revision number). Documents which are applicable to both NAA/QE/EASA and maintenance organisation are made available on the EASA Web site.

Each time a cross reference is provided to another document or another chapter / paragraph of the same document, this reference is identified with grey text.







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**0.7. Language.**

All documents connected with the implementation of this UG including, syllabus, examination, certificates, contracts, correspondence between the AMO and the outside agency or RL3 for the purpose of training or examination, correspondence between the AMO and the assigned inspector and/or EASA, etc. shall be in the English language unless otherwise agreed by EASA.





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## 1. General





## 1.1. Objectives of this UG

145.A.30 (f) requires that “The organisation shall ensure that personnel who carry out and/or control a continued airworthiness non-destructive test of aircraft structures and/or components are appropriately qualified for the particular non-destructive test in accordance with the European or equivalent Standard recognised by the Agency”. Additional information is provided in AMC 145.A.30(f). In addition 145.A.30 (e) requires the approved organisations to establish and control the competence of personnel involved in any maintenance, (...) in accordance with a procedure and to a standard agreed by the competent authority.

The objectives of this UG are to provide guidance on:

- the process to implement EN4179 to qualify the personnel performing NDT, personnel directly responsible for the technical adequacy of the NDT methods used, who approve NDT procedures and/or work instructions, or who provide technical NDT support, training and examination;
- the information contained in the NDT written practice to show compliance with EN4179;
- the process to issue and monitor the authorization of the NDT staff to sign-off the NDT tasks they have performed; and,
- the process to issue and monitor the certifying staff authorization to NDT staff under D1 rating.

## 1.2. Understanding NDT qualification, certification and authorisation in an AMO

EN4179 is an employer-based qualification and staff certification system, this means that the qualification of the NDT staff employed by a particular AMO must follow the procedures of that AMO. If the NDT staff leaves AMO A and joins AMO B then:

- the NDT certification issued by AMO A is revoked; and,
- the NDT staff must meet the qualification and certification requirements of AMO B.

In this UG the term “*NDT qualification*” is used to refer to the process to satisfy the required training, experience and examination as specified in EN4179 and described in the AMO NDTWP. (See part 2 of this UG)

In this UG the term “*certification*” is used to refer to the verification made by the RL3 on behalf of the AMO. A certification statement will be issued to declare that the NDT candidate has passed the vision examination and meets the necessary training, experience and examination for a particular level in accordance with the AMO NDTWP. (See section 2.10 of this UG)

In this UG the term “*AMO authorization*” is used to refer to the authorization issued by the AMO quality department to the NDT staff to perform specific NDT functions and/or sign-off the performance of an NDT task, or in the case “*C/S authorization*” to perform and issue a release to service for the particular NDT tasks performed. (See part 4 of this UG)

The qualification process of the NDT staff includes NDT qualification and AMO qualification.

NDT qualification process shall give the person the skills, training, knowledge, examination and experience required to perform NDT.

AMO qualification process shall give the person the skills, knowledge and experience required to perform the assigned tasks at the AMO.



**1.3. NDT written practice, MOE, NDT activity manual and work instruction.***EN4179 3.34, 3.36, 4.1*

The **NDT written practice (NDTWP)** shall describe the NDT qualification and certification process, this includes:

1. the procedures for the qualification and certification of the NDT staff;
2. the functions assigned to the different levels of NDT staff
3. the conditions for the validity of the NDT staff certification
4. the procedures for the suspension and revocation of the NDT staff certification.

The NDTWP should be a stand-alone document and include a statement indicating the approval by the RL3.

The **MOE** shall describe the AMO qualification process, this includes:

1. the general AMO training and experience requirements for NDT sign-off staff shall be included in **MOE 3.11**
2. the general AMO training and experience requirements for NDT C/S shall be included in **MOE 3.4**

An AMO performing NDT inspections should have:

1. detailed description of the NDT facilities, equipment, tooling, materials, etc.
2. procedures for system performance check and/or calibration requirements of NDT equipment and tooling;
3. NDT procedures and work instructions in use by the AMO for the inspection of aircraft/parts.

This information may be consolidated in an **NDT activity manual** or may be included in other documents in use in the AMO, for example: MOE, tool control and calibration procedures, etc.

A **work instruction** details the process, technique and testing parameters necessary to perform a NDT inspection in a particular aircraft/component. The work instruction shall specify amongst other things the method, technique to be used for inspection, the part preparation for inspection, the equipment and material for inspection, the area to be inspected, the processing parameters (such as dwell time, drying time, temperature, time, current, etc.), if applicable the acceptance criteria, etc.

A work instruction is required when the OEM/TCH/STCH/DOA maintenance data provides only general information about the inspection procedures to be used. The work instruction shall be approved by a L3 for the particular method designated by the AMO and it shall comply with the guidance provided by the OEM/TCH/STCH/DOA maintenance data.

Work instructions issued by the AMO fall under Documentation/Maintenance Instructions Issued by the maintenance organization, therefore **MOE 2.8** should describe the information to be included in the work instructions, the revision of the work instructions and the approval of the work instructions.

*ASTM standards for the different NDT methods provide indications on the contents of work instructions. This can be used as guidance for developing work instructions (for example see ASTM1417 section 6.7)*

<i>Document</i>	<i>Approved process</i>
<i>NDT Written Practice</i>	<i>Approved by RL3 Approved by AMO QM Approved by EASA (direct or indirect approval)</i>
<i>MOE</i>	<i>Approved by AMO QM Approved by EASA (direct or indirect approval)</i>
<i>Work instruction</i>	<i>Approved by a L3 in the method</i>





#### 1.4. NDT interpretation and evaluation of indications and documenting inspection results in AMO.

EN4179 3.8, 3.17

This UG speaks about interpretation and evaluation of indications, these two terms are defined in EN4179.

During an NDT inspection, the NDT staff may detect several indications. Interpretation is the determination of whether these indications are relevant or non-relevant.

After an indication is categorized as relevant it must be subject to evaluation.

The evaluation of indications shall be performed taking into account the criteria in the maintenance data and/or work instruction. The evaluation will determine:

- Whether the indication meets an specified acceptance/ rejection criteria; and/or,
- The characteristics of the indication such as size, location, etc.

The evaluation of the relevant indications shall be documented, meaning that the NDT staff performing the evaluation should indicate in the maintenance records the result of the evaluation.

*Example 1: CMM 32-40-yy subtask 32-40-yy-aa. MT inspection of bolts p/n: 12345*

*Perform a magnetic particle inspection in accordance with SPM 20-40-xx-bb on each bolt. Discard a bolt that has a crack.*

*The NDT staff performing the evaluation of the relevant indications will determine which bolts have a crack and must be discarded. The NDT staff will document in the work card how many bolts and if applicable which bolts (p/n, s/n) have been discarded.*

*Example 2: Aircraft NDT manual 51-96-yy subtasks 51-96-yy-aa. ET inspection to determine location and dimension of cracks in fuselage skin area*

*The NDT staff performing the evaluation of the relevant indications will determine which indications are cracks. The NDT staff will document in the work card the location and dimension of each crack.*

#### 1.5. Outside Agency

EN4179 3.24, 4.4.3

An outside agency is a company or organization outside the AMO, who provides NDT services to implement the requirements of EN4179, such as training and examination of NDT personnel. The outside agency can also provide RL3 services, meaning that the AMO may nominate as RL3 a person qualified as L3 by the outside agency. Within the context of this UG, if the AMO wants to use an outside agency for training, examination or RL3 services, the outside agency has to be under the control of an **EU NDT board member** of the Aerospace NDT Boards Forum (ANDTBF) **with voting status**.<sup>1</sup>

The ANDTB Forum members can be found in the document ANDTBF\_02 issued by the Aerospace NDT Board Forum published in the <http://www.efndt.org/Services/Document-Store?EntryId=15421>. Nevertheless, since the membership of the ANDTBF may change with time, the AMOs are requested to contact their assigned inspector to confirm the acceptable **ANDTB**.

Whenever an AMO wants to use an outside agency for training, examination and/or RL3 services, a contract/ agreement should be established detailing the services contracted, the responsibilities of both parties, the conditions for providing the services, such as the number of visits of the RL3 to the AMO per year, participation of RL3 in the internal audits and the EASA audits, etc.

<sup>1</sup> This includes UK NDTB, Singapore in NDTB limited to organisations with principal place of business in Singapore and Australia NDTB limited to organisations with principal place of business in Australia or New Zealand.





## 1.6. Use of EN4179

This UG has been developed taking as reference the EN4179:2017. At the time of publication of this UG the PrEN4179 Edition P6 is already available although it has not been formally adopted. Nevertheless, AMOs are strongly advised to familiarise themselves and progressively adapt their procedures in accordance with prEN4179 P6.

## 1.7. Structure of this UG.

This UG is divided in the following chapters:

Chapter 0: Introduction

Chapter 1: General

Chapter 2: Guidance on the implementation of EN4179

Chapter 3: NDT written practice.

Chapter 4: AMO qualification

Chapter 5: Appendices





## 2. Guidance on implementation of EN4179





## 2.1. NDT Methods

*EN4179 1.3, 3.18, 3.32, 4.1.2, 4.2*

This chapter provides guidance for the implementation of the qualification and certification requirements of EN4179 for the following common NDT methods:

- Liquid penetrant (PT)
- Magnetic particle (MT)
- Thermography (IRT)
- Eddy current (ET)
- Ultrasonic (UT)
- Radiography (RT)
- Shereaography (ST)

This user guide does not include guidance for qualification procedures for emerging methods<sup>2</sup>, each particular case shall be discussed with the assigned inspector.

The AMO must identify the different techniques within the methods that they are going to use. The table included in Appendix 5 is a draft document produced by the ANDTBF to show examples of how the AMO may identify the methods/ techniques. The table is in draft status not approved by the ANDTBF yet. The RL3 should define the methods and techniques to reflect the work in the AMO.

## 2.2. NDT with direct readout instruments and go/no-go test equipment.

*EN4719 3.5*

An NDT inspection performed using a direct readout instrument or a “go/no go” test equipment may not require that the person performing the inspection is qualified as L1, L2 in accordance with EN4179.

EN4179 defines direct readout instruments as “Instruments that physically display measurements in dimensional or electrical units (e.g. Inches, millimetres or %IACS.) either as digital readout or an analog display, such as a scale/pointer configuration and do not require special skills or knowledge to set up the instrument and do not involve adjusting signal displays such as gates, delays, gain, or phase to obtain measurements. For example, common direct readout instruments include basic ultrasonic thickness gauges without an oscilloscope display, and eddy current coating thickness gauges”.

If the AMO performs NDT inspections in an aircraft/component using a direct readout instrument and the use of this instrument is indicated in the maintenance data (CMM, AMM, SB, repair instructions,...), then the AMO does not require an NDT approval (nor D1 neither NDT in the course of maintenance) and the person performing this inspection does not need to be qualified as L1 or L2 in accordance EN4179.

If the AMO performs NDT inspections in an aircraft/component using a direct readout instrument but the use of this instrument is not indicated in the maintenance data of the aircraft/ component, for example the component repair data indicates “determine remaining thickness using ultrasonic inspection, remaining thickness should be more than XYZ inches”, in this case the AMO requires an NDT approval (either D1 or NDT in the course of maintenance). A L3 of this AMO qualified for the particular method shall develop a work instruction applicable to this component explaining:

- how to perform thickness measurement using a particular direct readout instrument; and,
- the qualification of the person performing this inspection (it may not need to be qualified as L1 or L2 in accordance with EN4179)

<sup>2</sup> In prEN4179:2019, Shereaography (ST) is removed from the NDT common methods and it will consider an emerging method.







Person performing inspections using direct readout instruments will need to be qualified for the use of such instrument in accordance with a procedure established by the AMO in the MOE.

### 2.2.1. NDT go/no-go test equipment.

A particular case of direct readout instrument is a go/no go test equipment. This go/no-go test equipment should be understood as:

- a test equipment which does not require special NDT knowledge/ skills to set-up or adjust the equipment;
- the equipment inspects the part and performs the interpretation and evaluation of indications; and,
- the equipment provides to the equipment operator a clear indication whether or not the result of the evaluation is accept or reject, such as for example a PASS/ NO PASS, or RED/GREEN indication.

Depending on how this NDT inspection process using a go/no-go test equipment is established, the equipment operator may or may not need NDT qualification in accordance with EN4179. The AMO should do a case by case evaluation and discuss it with the assigned inspector.

### 2.3. Levels of qualification and certification

*EN4179 5.1, 5.1.1, 5.1.2, 5.1.3, 5.1.4, 5.1.5*

EN4179 defines four basic levels of qualification and certification: L1-Limited, L1, L2, and L3. This section includes guidance for the L1, L2, and L3.

The qualification and certification of L1- limited is not explained in this UG. The AMO shall approach the allocated inspector to discuss this specific case.

The AMO must have qualification and certification procedures for each NDT method and level of certification intended to be used at the organization as defined in the scope of work. For example if the AMO is going to perform ET using NDT L2 and L3 staff, then the maintenance organisation only needs to develop qualification and certification procedures for ET in these two levels.

The AMO must document the trainees participating in a training programme for an NDT method in the process to become L1 or directly L2. The AMO must develop a training programme for each trainee identifying:

- when the training programme starts and ends,
- the method, level, techniques in the training programme
- the sequence and duration of the different phases of the training, such as practical training to obtain experience, general training, examination, etc.

During the training programme the trainees shall:

- obtain experience under the direct observation of a Level 2 or Level 3 in the same method,
- obtain experience under the direct observation of a Level 1 only when approved by the responsible Level 3,
- not make accept or reject decisions,
- not independently conduct tests,
- not independently perform any other NDT function





For L1, L2, and L3 staff the AMO may assign some or all of the following functions to each level of certification for each method for which the person is certified. The AMO written practice shall describe the functions assigned to each level/method.

The L1 individuals shall be competent to:

- set up and standardize equipment in accordance with approved work instructions;
- conduct system performance checks in accordance with the applicable instructions issued by the AMO;
- process parts and document results in accordance with approved work instructions;
- carry out any necessary preparation of parts before or after inspection in accordance with approved work instructions;
- receive guidance or supervision from a certified L2 or L3 in that method when necessary;
- in specific cases the RL3 may approve that the L1 individuals perform interpretations and evaluations of indications on specific product(s) for acceptance or rejection in accordance with approved work instructions. The AMO written practice shall detail the cases and/or tasks for which the L1 can perform the evaluation of indications. The practical examination of the L1 individuals certified to interpret and evaluate shall include an assessment of the proficiency interpreting and evaluating indications.<sup>3</sup>

The L2 individuals shall be competent to:

- set up and standardize equipment in accordance with approved work instructions;
- conduct system performance checks in accordance with the applicable instructions issued by the AMO;
- process parts in accordance with approved work instructions;
- carry out any necessary preparation of parts before or after inspection in accordance with approved work instructions;
- interpret and evaluate for acceptance or rejection, and document the results;
- provide the necessary guidance and/or supervision to trainees and L1 personnel;
- when specified in the AMO written practice, the L2 functions can include developing work instructions. Such work instructions shall require final approval by a L3 certified in the method. The AMOWP shall include an assessment of the proficiency developing work instructions. This assessment shall be done by a L3 in the method and it shall be properly documented.

The L3 individuals shall be competent to assume the following functions:

- assuming technical responsibility for the NDT facility and staff;
- select the method and technique for a specific inspection, however when the approved maintenance data indicates a specific inspection the L3 **cannot** deviate from this specific inspection;
- preparing and verifying the adequacy of procedures and work instructions;
- approve NDT procedures and work instructions for technical adequacy;
- providing or directing training and examination of personnel when the L3 is nominated instructor or examiner by the RL3;
- if the L3 is certified as L2 then, he can also perform the functions of the L2;
- if required by the AMO, audit the contracted outside agency to verify the correct implementation of the contract between the AMO and the outside agency;
- provide support to auditors of the AMO to perform product audits and the implementation of NDT procedures

<sup>3</sup> See practical examination section





An individual cannot certify to L3 without prior certification to L2 in the method. This means that a candidate to be certified as L3 in a particular method in an AMO must demonstrate that he/she is certified to L2 in the method.

## 2.4. Responsible level 3

### EN 4179 4.4.1

The AMO must have a responsible level 3 (RL3), the nomination and approval of the RL3 must follow WI.CAO.00115. The RL3 may be either:

1. a natural person employed/contracted by the AMO, thereafter called “**internal RL3**”; or,
2. a natural person working for the outside agency contracted by the AMO to provide the RL3 services, hereinafter called “**external RL3**”.

### 2.4.1. Requirements for the internal RL3

The candidate for internal RL3 shall be qualified as L3 in all the methods used by the AMO. The qualification as L3 must satisfy the requirements of the AMO NDTWP where this person is going to act as internal RL3. This requires that this person can show the **required training, experience and examination to L3**. The required examination shall have been administered by an outside agency.

If he/she is not qualified as L3 in all the methods used by the AMO, then he/she will not be able to assume some RL3 functions for that method and the AMO would need to identify another L3, qualified as L3 by an outside agency, to perform those functions when necessary.

In accordance with EN4179, an individual cannot certify to L3 without prior certification to L2 in the method. This means that L3 must demonstrate that they meet the certification requirements to L2 in the method at the time of the first qualification to L3 for the AMO where they will be certified as L3. This also applies to a person who is going to be nominated as **internal RL3**.

*Example: Candidate 1 is going to be employed by company A to be the new internal RL3. Candidate 1 was the internal RL3 in company B, what does candidate 1 need to do to become internal RL3 in company A?*

- *Candidate 1 needs to satisfy the L3 qualification requirements in company A, meaning candidate 1 needs to demonstrate that he/she satisfies the training, experience and examination requirements of company A NDTWP for L3.*
- *Candidate 1 and company A should assess whether his/her previous training, experience, general examination and other NDT methods examination in company B are equivalent to the requirements of training, experience, general examination and other NDT methods examination in company A. If the assessment is positive then candidate 1 can credit his/her training, experience, general examination and other NDT methods examination.*
- *Candidate 1 shall receive NDT specific refresher training in accordance with company A NDTWP.*
- *Candidate 1 shall pass vision acuity examination in accordance with company A NDTWP*
- *Candidate 1 shall provide evidence that he/she passed the specific and practical examination to L2 in accordance with EN4179. (in company A or in company B)*
- *Candidate 1 shall pass specific and practical examination to L3 in an outside agency in accordance with company A NDTWP and EN4179*
- *Candidate 1 and company A shall issue the certification statement for L3.*

### Evidences to be provided for an **internal RL3**:





1. Evidence of specific and practical examination to L2 at the time of the first qualification as L3 in the method in an EASA 145 AMO in accordance with EN4179.
2. Evidence of training as L2 or evidence that previous training can be credited in accordance with EN4179 and the AMO NDTWP.
3. Certificate of general examination to L2 or evidence that general examination can be credited in accordance with the AMO written practice.
4. Experience records, such as log book or similar, to demonstrate that he/she has acquired the minimum experience requirements for L2 and L3. If the experience was acquired before joining the AMO then the candidate RL3 must demonstrate that his/her previous experience is acceptable in accordance with the AMO NDTWP
5. Certificate of General L3 examination and additional other methods NDT examination in accordance with the AMO NDTWP or evidence that they can be credited in accordance with the AMO NDTWP.
6. Certificate of specific and practical L3 examination in accordance with the AMO NDTWP Evidence of other training/ qualification in accordance with the WI.CAO.00115 (i.e. MOE, HF, EWIS, FTS, etc.)

#### 2.4.2. Requirements for external RL3

The candidate for RL3 shall be qualified as L3 in accordance with EN4179 by the outside agency in at least one of the NDT methods used by the AMO. If he/she is not qualified as L3 by the outside agency in all the methods used by the AMO, then he/she will not be able to assume some RL3 functions for that method and he/she would need to identify another L3, qualified as L3 by the outside agency, to perform those functions when necessary.

Evidences to be provided for an **external RL3**:

1. Agreement between the AMO and the outside agency contracted to provide RL3 services, training and examination.
2. Documentation issued by the outside agency showing that:
  - the person possesses a L3 certification in accordance with EN4179 indicating the methods; and,
  - the specific and practical examination cover sufficient scope regarding the codes, standards and practices used by the AMO.
3. Evidence of other training/ qualification in accordance with the WI.CAO.00115 (i.e. MOE, HF, EWIS, FTS, etc.).

#### 2.4.3. Functions of the RL3

- A. The RL3 is responsible for NDT qualification and certification process, this means, for all the methods the RL3 shall:
- establish the written practice explaining the levels of qualification and certification in the organisation, the training, experience and examination requirements and procedures, and where/ how the training and examination will be performed;
  - ensure that all necessary conditions for training and examination are established and implemented;
  - retain written and practical examinations;
  - designate examiners and/or instructors providing training and examination;
  - issues the certification statements to the NDT staff in accordance with the AMO written practice
  - if required, the RL3 shall designate outside agencies used for training and examination
  - if required, the RL3 should audit in conjunction with the AMO quality system the outside agencies providing training and/or examination services,





- B. The RL3 shall be capable of assuming the overall technical responsibility for the NDT facility and processes. This means that for the method(s) for which he/she is qualified as L3 under EN4179 by an outside agency, he/she :
- Ensures the adequacy of the NDT facilities and materials in use at the organisation.
  - Ensures equipment adequacy, including adequate programme for the maintenance, service and calibration of the equipment.
  - Approves the use of alternative tools in the particular NDT method in accordance with the AMO MOE procedures.
  - Establishes the process controls in accordance with applicable standards (i.e. system performance check iaw ASTM E1444 for MT inspections)
  - Approves the work instructions developed for the performance of a particular inspection (when necessary) in the method.
  - Performs the annual maintenance of the NDT staff at the organisation or nominates another L3 in the method to perform the annual maintenance.
  - Makes the assessment of previous training and previous experience of the NDT staff joining the AMO and identifies the scope of training required to be completed prior certification.

For the method(s) for which he/she is not a L3 qualified under EN4179 by an outside agency, the RL3 shall designate a L3 qualified under EN4179 by an outside agency in the particular method to perform the functions listed in B above.

## 2.5. NDT Qualification procedures

The NDT qualification procedures must describe the NDT training, NDT experience, NDT examination required for a particular NDT method and level. These qualification procedures shall be included in the NDTWP. The NDT written practice must also describe the qualification process for additional technique(s) as described in 2.12. The NDTWP and any amendment to the NDTWP shall be approved by the RL3. After approval by the RL3, the NDTWP shall be submitted to the AMO quality manager for acceptance. The AMO quality manager shall submit the NDTWP to EASA for approval, in case of direct approval; or, notification, in case of indirect approval.

## 2.6. NDT training

*EN4179 3.13, 3.16, 6.1, 6.1.1, 6.1.2, 6.1.3, 6.1.4, 6.1.5, 6.2, 6.2.2*

Each NDT candidate shall receive formal training, this training may be conducted prior or in conjunction with the “on the job training” to gain NDT experience. The **training** will have a general part, specific part and practical part and it shall be conducted in accordance with *training course outlines* detailed in the AMO NDTWP and approved by the RL3. The training can be delivered internally by instructors approved by the RL3 or it can also be delivered externally by an outside agency designated by the RL3 (see point 2.6.3)

In both cases, the RL3 is responsible to assess if the training delivered meets the training course outlines defined in the AMO NDTWP and determine if there is a need of additional training (for example specific training). This assessment shall be documented.

### 2.6.1. Training course outlines





The RL3 must establish a training course outline for each method and for each level of qualification planned to be used at the AMO (L1, L2). The training course outline shall specify:

- the training syllabus. The syllabus must follow EN4179 and the recommended training guidelines issued by the ANDTBF in document ANDTBF/06 latest issue. <https://www.efndt.org/Services/Document-Store?EntryId=15421> ;
- the duration of the training. This must follow the minimum required duration established in EN4179
- the training method, for example theoretical or practical, classroom or distance learning, etc.;
- reference to the training material to be used during the training such as student notes, training samples specifications, industry standards, maintenance data used for the specific training, etc.;
- a list of references from which the training material is derived;
- the test samples used for the practical exercises.

### 2.6.2. Training facilities

Both theoretical and practical training shall be delivered in adequate facilities well equipped with equipment and training aids, models, samples, etc. to ensure that all aspects of the training course requirements are met. The following characteristics shall be taken into account:

- The size and structure of facilities shall ensure protection from the prevailing weather elements and proper operation of all planned training on any particular day.
- Fully enclosed appropriate accommodation separate from other facilities shall be provided for the instruction of theory and the conduct of written examinations. The accommodation environment shall be maintained such that students are able to concentrate on their studies or examination as appropriate, without undue distraction or discomfort.
- The maximum number of students undergoing knowledge training during any training course shall not exceed 12.
- The size of accommodation for examination purposes shall be such that no student can read the paperwork or computer screen of any other student from his/her position during examinations.
- Practical training shall be performed in adequate facilities or in the actual maintenance environment such as the NDT workshop, using NDT equipment normally used for NDT inspections. Sufficient number of representative test samples should be available for practical training.

When the training is performed internally then the training facilities shall be identified in the NDTWP.

If the training is performed by an outside agency contracted by the AMO, then the AMO NDTWP shall indicate the address of the facilities.

### 2.6.3. Instructors

The training can be delivered internally by instructors designated and approved by the RL3 or it can also be delivered externally by an outside agency contracted by the AMO to provide training services.

#### For internal training

- (a) The RL3 shall approve the instructors for the different training courses. In this case, the instructors to be used for the training shall:
- Be qualified as L2 or L3 under EN4179 or an equivalent level in the national aerospace NDT standard
  - Have a minimum of 5 years' working experience as L2 or L3 or equivalent level in the national aerospace NDT standard.
  - Be familiar with the specifications and standards used by the AMO to be able to deliver the specific part.
  - Have the skills and knowledge to plan, organize, and present classroom training and practical exercises in accordance with approved course outlines.



For training delivered by an outside agency

- (b) The RL3 shall designate in the NDTWP the outside agency contracted to deliver the training (general training, specific refresher training, etc.).

**2.6.4. Training certificate**

At the completion of the training, a training certificate shall be issued detailing, as a minimum:

- name of the trainee;
- date and place of birth of the trainee;
- name of the AMO;
- training course with reference to method, level, training course outlines and the AMO NDTWP;
- date and place where the training took place;
- duration (hours) of the training;
- if the training is performed internally, this certificate is issued by the RL3.
- if the training is performed by an outside agency, then the training certificate shall be issued by the outside agency.

**2.6.5. Previous training and equivalent training**

**Training** credits can be given to in the following cases:

- the person was previously certified under EN4179 or NAS410 in another EASA part-145 AMO; or
- the person was previously certified under EN4179, NAS410 or the national aerospace NDT standard in a maintenance organisation holding a national approval for maintenance or production; or
- the person was previously certified in accordance with the national military requirements in a military maintenance organization; and
- the previous training is properly documented (training course outlines, training certificate, etc.)

The RL3 shall compare the previous training with the NDT training course outlines included in the AMOWP to assess the equivalency between them and determine the missing portions of training that the person must receive. This assessment shall be documented and it shall include as a minimum:

- (a) the previous training certificates;
- (b) the previous training course outlines (syllabus, duration, type of training (theoretical/practical, classroom/distance-learning)) and the training provider of the previous training;
- (c) the equivalency to the current training outlines; and,
- (d) the missing portions of training that the person must receive.

Any person credited with previous training must always receive the missing portions of the training **and** NDT specific refresher training.

**2.6.6. NDT specific refresher training**

This NDT specific refresher training is required for any person credited with **previous training** and for any person who has passed formal training at the AMO but who has not received its NDT certification statement from the RL3 within 12 months after the formal training.

The specific refresher training shall be conducted in accordance with a training course outline detailed in the NDTWP and approved by the RL3. This training must cover the AMO specific products, equipment set-up, operation and standardization, specific operating procedures, applicable techniques.





### 2.6.7. Health and safety training

The AMO must provide health and safety training to every person undergoing NDT “on the job training” or seeking certification to perform NDT tasks. The health and safety training shall be performed at the beginning of the “on the job training” or, for persons credited with previous experience, before the certification.

The AMO must establish training outlines for health and safety training including syllabus, duration, method of training (classroom, elearning, self-study). The syllabus must consider:

- 1) the requirements for the handling of hazardous substances,
- 2) accident prevention and safe working practices,
- 3) compliance with local health and safety regulations.

The health and safety training outlines must be included in the AMO NDTWP. The health and safety training can be provided by any person or organisation designated by the RL3.

Additionally, for radiography, the AMO shall provide specific health and safety training on the hazards and safety requirements associated with ionizing radiation and the national applicable national regulations and laws.

The syllabus, duration, method of training and instructors/ training organisation must comply with the applicable national regulations and must be included in the AMO NDTWP.

## 2.7. NDT examination

*EN4179 3.2, 3.10, 3.22, 3.30, 3.33, 4.1.4, 7.1, 7.1.1, 7.1.2, 7.1.3, 7.1.4, 7.1.4.1, 7.1.4.2, 7.1.4.3, 7.1.4.4, 7.2, 7.2.1, 7.2.2, 7.2.3*

Every person seeking NDT certification for a particular level/method/technique shall pass NDT examination.

The NDT examination for L1, L2 and L3 shall include general examination, specific examination and practical examination for the particular method/level.

Additionally for L3 it shall include an “additional other NDT methods” examination on the general knowledge of other methods as per the guidance in paragraph 2.7.2.

The NDT examination can be performed internally by the AMO or externally by an outside agency designated by the RL3. In no case can an examination be administered by one’s self or by a subordinate.

When the examination is performed internally then the AMO written practice shall include:

- the requirements to be met by the examination;
- the procedures for the performance of general, specific and practical examinations; and
- the list of examiners

When the examination is performed by an outside agency, then the AMO NDTWP shall include:

- the name of the outside agency; and
- the requirements to be met by the examination.

**The examination of the RL3 must be performed externally by an outside agency designated by the RL3 as explained in 2.4.**

Previous NDT examination in another maintenance organisation cannot be credited except for general examination as described in 2.7.1, meaning that every person seeking NDT certification in an AMO must pass (internal or external) specific and practical examination with that AMO.

### 2.7.1. General examination

The general examination shall comply with EN4179, this means that for each method and level:







- the general examination shall be closed book examination;
- the minimum number of questions for L1, L2 and L3 is 40;
- the questions can be open questions or multiple choice questions as defined in the AMOWP;
- the level of the questions should be adequate to the certification level (L1, L2, L3);
- the candidate must achieve a minimum score of 70%.

The general examination can be credited if the candidate has a current ASNT or ISO 9712 NDT certificate for the particular method at the appropriate level. The acceptance of these certificates to credit for the general examination must be described in the AMO written practice. In the case that ASNT or ISO9712 certificate is used instead of a general examination, the score to be given to the general examination shall be 80%.

### 2.7.2. “Additional other NDT methods” examination for the L3

The “additional other NDT methods examination” shall be administered to a person seeking examination for L3 for the first time. This is a one time examination. This examination shall follow the guidance issued by the ANDTBF in document ANDTBF\_10 General Knowledge of Other Methods as required by EN4179 latest issue which is published in <https://www.efndt.org/Services/Document-Store?EntryId=15421>

### 2.7.3. Specific examination

The specific examination shall comply with EN4179, this means that for each method and level:

- The specific examination must be specific for the work to be authorised, this means it shall cover the requirements and use of the specifications, codes, equipment, operating procedures and test techniques the candidate may use in the performance of his/her duties in the AMO
- The specific examination shall be open book but questions utilizing such material shall require understanding of the information contained therein rather than merely finding its location.
- The minimum number of questions for L1, L2 and L3 is 30
- The specific examination can be multiple choice question or open questions as defined in the written practice.
- The level of the questions should be adequate to the certification level (L1, L2, L3)
- The candidate must achieve a minimum score of 70%

### 2.7.4. Practical examination

The practical examination for L1, L2 shall comply with EN4179, this means that for each method and level:

- The practical examination is performed using documented test samples.
- The candidate is not familiar with the test samples used in the examination.
- The practical examination must include minimum 2 test samples with at least 1 test sample per technique for which certification is sought.<sup>4</sup>
- The practical examination shall assess the proficiency in:
  - the use of work instructions,
  - the use and standardization of equipment and materials,
  - the adherence to procedural details,
  - processing parts,
  - the interpretation and evaluation of indications for L2, and for L1 only if he/she is going to be authorized to accept or reject parts, and
  - the documentation of results.

<sup>4</sup> For L2, the practical examination may include test samples without discontinuities but at least 2 test samples of the total required for the practical examination must include discontinuities





- For each test sample the candidate must achieve a minimum score of 70% and must detect all discontinuities in the test sample.
- When the L2 functions include developing work instructions then the L2 must pass an assessment performed by a L3 in the method.

The practical examination for L3 shall comply with EN4179, this means that for each method:

- The practical examination will consist of preparation of an NDT procedure including work instruction appropriate to the AMO work
- The practical examination shall take place in conjunctions with the general and/or specific examination.
- The practical examination shall assess the following aspects of the NDT procedure/ work instruction:
  - Technical accuracy
  - Technical content
  - Clarity of the procedure/ work instruction
- The candidate must achieve a minimum score of 70%.

When the L3 is processing parts and interpreting and evaluating indications and documenting results, then the L3 must pass the same practical examination as for L2 staff.

A sample template checklist to be used for the marking of the practical examination for L1 and L2 is included in [Appendix 1](#). This template provides only a reference and the RL3 must detail the particular subjects to be evaluated for each method during the practical examination.

When the examination is performed by an outside agency, the marking of the examination falls under the control of the outside agency.

### 2.7.5. Nomination of Examiners

If the examination is performed internally, the administration and grading of the examination is the responsibility of the RL3 or examiner L3. The RL3 may nominate examiners for each method used in the organisation. The examiners must be certified as L3 under EN4179 for that particular method in the AMO. The RL3 can be an examiner for the methods for which he/she is certified as L3 under EN4179.

The tasks of the examiner for the method for which he/she is nominated:

- preparation of questions and master answers for the general and specific examination
- selecting and documenting test samples for the practical examination
- ensure the security of the examination
- marking of examinations

The list of designated examiners must be included in the AMO written practice.

If the examination is performed by an outside agency then the nomination of examiners falls under the control of the outside agency.

### 2.7.6. Preparation of questions and master answers

The AMO may use open questions, multiple choice questions or true/false questions.

When the examination is performed internally, the examiner must prepare the examination questions and master answers prior to the examination.

When preparing the examination paper, the examiner must ensure that:





- The questions are adequate in accordance with EN4179 for the type of examination (general/ specific) , method and level
- There is a master answer for each question
- The questions included in the examination paper cover all the subject material in the method.
- The questions included in the examination paper were not used in the past 12 months.

When the examination is performed by an outside agency, the preparation of questions and master answer falls under the control of the outside agency.

### 2.7.7. Test samples

A test sample is a part<sup>5</sup> containing one or more known and documented natural or artificial defects. A test sample can be used to provide practical training or it can be used for practical examination. However a test sample used for training or for the annual maintenance cannot be used for examination.

When the examination is performed internally, the RL3 must identify and list the test samples used for training and the test samples used for examination. The test samples used for examination must be stored at the AMO in a secure location under the control of the RL3. All samples must have a documented record of the defects to be detected and their location.

The test samples can be actual aircraft/ engine/ component parts or they can be fabricated test parts. The AMO may use scrap parts or unserviceable parts previously inspected at the AMO as test samples for training, but they cannot be used as test samples for examination unless the AMO has a system in place to ensure that the candidate is not familiar with the part. (for example the part was scrapped > 5 years before it is used examination, the part is reworked by the AMO, etc)

The AMO shall establish a system to record when each test sample was used for examination and ensure that a particular test sample will not be used in any examination for the next 12 months and it will not be used in any future examination for the same candidate.

When the practical examination is performed by an outside agency, the management of test samples is under the control of the outside agency.

### 2.7.8. Internal Examination report

After internal examination, an examination report shall be issued with the following information, as a minimum (See example in [Appendix 4](#)):

- Name and Surname of the candidate
- Name of the AMO
- Applicable Written Practice and standards used for the examination
- NDT Method, Level
- Exam Date(s)
- Certificate Issue Date
- Score for the General examination and specific examination, if applicable
- Technique used and score obtained for every test sample in the practical examination, if applicable
- Score for the practical L3 examination if applicable.
- Signature of the L3 examiner
- Any additional information relevant to the method/ technique such as material (metal, composite, etc.), application (NDT in welds, structures, etc.)

<sup>5</sup> In some cases, such as for example RT, an image can be used as test sample to train or to assess the candidate ability to interpret results.





### 2.7.9. Additional considerations for internal examination

Internal examination can be administered by the RL3 to all the NDT staff in the AMO for all the methods for which he/she is a L3 qualified by an outside agency in accordance with EN4179. Examination for the RL3 can only be administered by an outside agency.

Examination of other examiners nominated by the RL3 can only be performed by the RL3 or by an outside agency. Cross-examination, meaning that examiner#1 administers and grades the examination of examiner#2 and examiner#2 administers and grades the examination of examiner#1, is not permitted.

Examination by a subordinate is not permitted, for example if the NDT workshop manager is a L2 and the L3 examiner is a subordinate of the NDT workshop manager, then the examination of the NDT workshop manager cannot be performed by the subordinate L3.

### 2.7.10. Use of an outside agency to provide examination

When the examination is performed externally by an outside agency, the outside agency must follow the AMO NDTWP requirements and the examination shall be administered considering the AMO NDTWP and the information, codes, specifications provided by the AMO.

The AMO NDTWP shall include:

- The name of the outside agency,
- Type of the examination is open book/ closed book
- The number of questions for each method/ level
- The minimum number test samples used for the practical examination
- The minimum score required to pass each individual examination.
- The minimum average score to be eligible for certification

The AMO must provide all necessary information to the outside agency before the examination, such as:

- The name of the candidate, the method and techniques, the level of certification sought
- The type of examination (general, specific, practical, additional "other NDT method" for L3)
- The AMO written practice
- The AMO work instructions, specifications, codes, equipment, operating procedures and test techniques the candidate may use in the performance of his/her duties with the employer.

After the examination, an examination report must be issued by the outside agency stating as a minimum:

- The name of the outside agency administering the examination
- Name and Surname of the candidate
- Name of the AMO
- Applicable Written Practice and standards used for the examination
- NDT Method, Level
- Exam Date(s)
- Name of examiner
- Certificate Issue Date
- Score for the General examination, specific examination
- Technique used and score obtained for every test sample in the practical test
- Any additional information relevant to the method/ technique such as material (metal, composite, etc.), application (NDT in welds, structures, etc.)

### 2.7.11. Re-examination





Any person failing any general, specific or practical examination shall receive additional training before taking re-examination. The RL3 or the examiner shall assess the failed examination and determine which areas are deficient. Based on that assessment the RL3 or examiner shall prepare the syllabus of the additional training that needs to be delivered before re-examination.

The assessment performed by the RL3/ examiner and the syllabus of the additional training must be documented in a report and must be kept together with the re-examination records.

For the general and specific re-examination the examination paper must contain at least 25% different questions than the initial examination paper used and for the practical re-examination the test samples used must be different from the initial examination performed.

### 2.7.12. Scoring

To be eligible for certification or recertification, the following 2 conditions must be satisfied in the scoring:

1. The person shall achieve the following minimum scores on each individual examination:
  - General examination: 70%
  - Specific examination: 70%
  - Additional other NDT methods examination for L3: 70%
  - Practical examination L3 (preparing procedure): 70%
  - Practical examination L1, L2, and if applicable L3: 70% and detect all mandatory discontinuities, flaws or conditions specified by the L3.
2. The person shall have an average score of minimum 80%. The average score is calculated as the arithmetic mean of all the individual examination scores.

In the particular case that condition 1 is satisfied but condition 2 is not satisfied, the RL3 must assess the examination results and establish which examination must be performed again by the candidate.

### 2.7.13. Visual acuity examination

Every person undergoing NDT “on the job training” or seeking NDT certification for a particular method/ level in an AMO shall pass an examination for visual acuity. This examination consists of near vision examination and colour perception examination. Both the near vision examination and the colour perception examination shall be administered by trained personnel designated by the RL3 or by qualified medical personnel.

The visual acuity examination requirements are as follows:

1. Near vision examination shall be performed every 12 months. The method can be:
  - a. Tumbling E in accordance with ISO 18490
  - b. 20/25 (Snellen) at 16” (40.64 cm) ± 1” (2.54 cm) in at least one eye, natural or corrected
  - c. Jaeger No 1 at not less than 12” (30.48 cm) in at least one eye, natural or corrected.
2. Colour perception to be performed every 60 months (5 years), they must show that the person is able to differentiate the colours used in the NDT methods involved. It can be:
  - a. Ishihara test for colour-blindness
  - b. Other colour perception examination method.

The method of examination and the persons authorized to administer the visual examination shall be included in the AMO NDTWP .

The results of the examination shall be documented in a report to indicate the person performing the visual acuity examination, the date, the method used for the near vision examination and for the colour perception examination and the result of both examinations and if visual correction was worn to pass the visual examination. An example of visual acuity report is included in [Appendix 2](#).





The near vision test and the colour perception test are considered to expire at the end of the month in which they are due.

## 2.8. Experience

*EN4179 3.11, 3.21, 6.3, 6.3.1, 6.3.2*

Every person seeking NDT certification for a particular method/ level in an AMO shall have enough experience to assure that they are capable of performing the duties of the level for which certification is sought.

Experience is the **actual performance** of an NDT task or part of a task. The experience may include processing of practical test samples in the workshop, performing equipment set-up and system performance checks, part preparation before and after inspection, recognition, interpretation and evaluation of indications under appropriate supervision. At least 30% of the experience shall be obtained by the performance of NDT tasks in the actual working environment.

For L1 and L2 without previous L1 certification, the experience shall be acquired under the supervision of a L2 or L3. For L2 with previous L1 certification, the experience shall be a combination of actual performance of L1 tasks and performance of L2 tasks under the supervision of a L2 or L3. The minimum experience for L1, L2, L3 are included in EN4179. The RL3 must ensure that experience is gained adequately in each technique being sought for approval within the method

The AMO NDTWP must include the minimum experience requirements for each method and level in accordance with EN4179 and it shall describe how the experience will be obtained. The experience shall be documented in an experience log book. The experience log book may be a paper log book or an electronic system. The minimum information to be recorded in the log book is indicated in [Appendix 3](#).

### 2.8.1. Previous experience and equivalent experience

The RL3 may accept the previous experience in the following cases:

- the person was a trainee acquiring NDT experience in another EASA Part-145 AMO; or
- the person was previously certified under EN4179 or NAS410 in another EASA Part-145 AMO; or
- the person was previously certified under EN4179, NAS410 or the national aerospace NDT standard in a maintenance organisation holding a national approval for maintenance or production; or
- the person was previously certified in accordance with the national military requirements in a military maintenance organization; and
- the previous experience is properly documented with experience records/ experience log book.

The RL3 shall review the previous experience records/ logbooks to assess which portion of previous experience can be accepted. The previous experience records shall be in English and it shall include:

- the name of organization where the experience was obtained;
- details of the tasks performed, the method and level, aircraft registration of component identification;
- the function (trainee, L1, L2) of the person performing the task;
- name of the supervisor if the task was performed under supervision;
- the date when the task was performed; and
- any other additional information necessary to determine the adequacy of the experience to the requirements of the AMO NDTWP.

## 2.9. Certification and recertification

*EN4179 8.1, 8.5, 8.5.1, 8.5.2, 8.5.2.1*

The RL3 shall issue a certification statement when the candidate:

- has completed the qualification process (training, examination, experience);
- has achieved an average score in the examination > 80%





- has a valid vision examination certificate in accordance with the NDTWP

If the general and specific training were completed more than 12 months before, then specific refresher training as specified in [2.6.5](#) is required before the issue of the certification statement.

The certification statement shall indicate:

- method, level and, in case of L1 and L2, also the techniques for which the candidate is recommended for certification,
- average score of examination,
- name of RL3 issuing the certification statement,
- name of the AMO and reference to the NDTWP used for the certification,
- date of issue of the statement and expiry date,
- if the individual needs visual correction for the performance of inspections, and
- any limitations determined by the RL3 or examiner.

The certification for L1, L2 and L3 expires after 5 years and it is considered to expire at the end of the month in which it is due. Before the expiration date the NDT staff must pass recertification. The recertification consists of:

- For L1 and L2: the NDT staff must pass specific and practical examination equivalent to initial certification.
- For internal L3: the NDT staff must pass specific and practical examination equivalent to initial certification and when he/she is authorized to process parts and/or interpret and evaluate indications he/she must pass practical examination equivalent to initial L2 certification.
- For external L3: the certification and recertification shall follow the procedures of the outside agency. When the external RL3 is authorized to process parts and/or interpret and evaluate he/she must pass practical examination equivalent to initial L2 certification.

## 2.10. Suspension and revocation of certification statement

*EN4179 8.3, 8.3.1, 8.3.2, 8.3.3, 8.4*

The certification statement is suspended when:

- The vision examination is expired
- The annual maintenance is expired
- The person does not pass the annual maintenance.
- The person's performance is found unsatisfactory in any manner.
- The person fails the recertification
- The person does not perform in the method for the AMO for more than 12 consecutive months.

After suspension, the certification statement can be reinstated when the cause for suspension is corrected.

The certification statement shall be revoked when:

- The person does not perform in the certified method for the AMO for more than 24 months
- The person does no longer work for the AMO
- The person's conduct is unethical or the person is found incompetent.

After revocation the person must pass recertification to reinstate the certification.

## 2.11. Additional techniques

*EN4179 3.32, 4.1.2*

A L1 or L2 holding a valid certification statement from the RL3 for a particular method and technique(s) may require to be certified for additional technique(s) not included in the certification statement. This shall be established by the RL3 in accordance with a procedure included in the written practice. The qualification process for additional





technique(s) shall include as a minimum practical examination using at least one test sample for each technique to be added.

## 2.12. Annual maintenance

### EN4179 8.6

The RL3 or other L3 nominated by the RL3 shall perform an on the job assessment of the technical proficiency of the NDT staff for each method for which they are authorized to inspect parts. This assessment shall be performed every 12 months after certification/recertification. The annual maintenance is not necessary the year of the recertification. The NDTWP shall include the procedure for the annual maintenance. Guidance for the annual maintenance is provided in the document ANDTBF\_12 Annual assessment prepared by the Aerospace NDTB Forum and published on: <https://www.efndt.org/Services/Document-Store?EntryId=15421>

## 2.13. Record keeping

### EN4179 4.1.6, 8.2, 8.2.1

The AMO shall keep the records necessary to demonstrate the training, experience and examination of each NDT staff, this includes:

1. Identification of the NDT staff: name, date and place of birth, formal education,
2. Certification statement issued to the NDT staff detailing the level, method, technique date of issue and expiry date
3. Copy of the AMO authorizations issued to the NDT staff
4. The latest examination papers (general, specific, practical) taken by the individual in the AMO. If the examinations were performed by an outside agency then the examination papers may be kept by the outside agency as agreed between the AMO and the outside agency.
5. The examination certificates of all examinations taken by the individual during his/her employment in the AMO. This includes certificates issued after internal examination and certificates issued by outside agency if an outside agency is used for examination.
6. NDT training history including: training syllabus, duration of training, dates of training, method of training, training providers/instructors. If previous training is accepted the records shall include the assessment of the previous training as detailed in 2.5.5.
7. NDT experience history including: the experience log book in the AMO and the records required to accept previous experience as detailed in 2.8.1.
8. The most recent visual acuity and colour perception examination report.
9. The annual performance review records
10. Suspended or revoked certification(s) shall be documented for reason and date. If applicable, date and action to reinstate certification(s) shall also be documented
11. NDT sign-off authorization or NDT C/S authorisation and the training and assessment records required to issue the authorisation

The AMO shall retain the records for at least three years after the NDT staff have ceased employment with the AMO. In addition, upon request, the AMO shall furnish the staff referred to in this point with a copy of their personal record on leaving the organization, except for the examination papers in point 3.







### 3. NDT Written practice (NDTWP)





### 3.1. General

The written practice shall address the procedural details necessary for the AMO to implement an NDT qualification and certification programme. The content and structure of the written practice is described in the next paragraph.

The written practice is considered an associated procedure to the MOE, it shall be listed on the MOE 1.11.2 and its implementation shall be audited by the AMO quality system.

### 3.2. NDTWP structure and content

## PART 0: INTRODUCTION

### 0.1 Table of Contents

This paragraph should include the table of contents of the NDT Written Practice. For standardisation purposes and to facilitate the production of the NDT written practice by the AMO, EASA recommends adoption of the following table of contents.

#### Table of Contents

##### Part 0: Introduction

- 0.1 Table of contents
- 0.2 List of effective pages
- 0.3 List of issues/Amendments revision records
- 0.4 Written Practice amendment procedure
- 0.5 Approval of the NDT written practice
- 0.6 Definitions and abbreviations

##### Part 1: General

- 1.1 Purpose
- 1.2 Methods and techniques
- 1.3 Responsible Level 3 (RL3)

##### Part 2: Qualification and Certification procedures

- 2.1 Levels of qualification and certification
- 2.2 Training
- 2.3 Examination
- 2.4 Experience
- 2.5 Visual examination
- 2.6 Certification and recertification
- 2.7 Annual maintenance
- 2.8 Additional techniques
- 2.9 Record Keeping

##### Part 3: Appendices to the written practice





## 0.2 List of Effective Pages

This paragraph shall include the list of effective pages. For guidance please refer to UG.CAO.00024 User guide for MOE

## 0.3 List of Issues / Amendments Record of Revisions

This paragraph should include the list of issues and the reason for revision for change of the NDTWP. Please note that the NDTWP issues and revisions must be numeric, for example issue 1 revision 3, the use of the alphabet for issue and revision control shall be avoided.

## 0.4 NDTWP amendment procedures

This paragraph shall describe the procedure followed by the AMO for the amendment of the NDTWP. This procedure shall indicate:

- Person responsible for amending the NDTWP
- Definition of minor & major amendments to the NDTWP and related approval process.
- Definition of criteria for new issue and/or revision (depending from the NDTWP revision system adopted by the AMO)

## 0.5 Approval of the NDTWP

This paragraph shall describe the approval process of the NDTWP, it shall indicate:

- The NDTWP and any amendment to the NDTWP shall be approved by the RL3.
- After approval by the RL3, the NDTWP is submitted to the AMO quality manager for acceptance.
- The AMO quality manager shall submit the NDTWP to EASA for:
  - approval, in case of direct approval; or,
  - notification, in case of indirect approval.



## PART 1: GENERAL

### 1.1 Purpose

*EN4179 3.34, 3.36, 4.1*

The purpose of the NDTWP is to establish:

1. the procedures for the qualification and certification of the NDT staff;
2. the functions assigned to the different levels of NDT staff
3. the conditions for the validity of the NDT certification
4. the procedures for the suspension and revocation of the NDT certification.

NOTE: the NDTWP shall not include inspection procedures

### 1.2 Methods and techniques used by in the organisation

*EN4179 1.3, 3.18, 3.32, 4.1.2, 4.2*

This paragraph shall identify the methods and techniques used by at the AMO for which they are going to qualify and certify NDT staff. If the AMO has several workshops performing NDT (i.e.: engine workshop, wheel and brake workshop, aircraft structures workshop, etc.) then this paragraph shall identify the different workshops and the methods and techniques used in each workshop.

An AMO approved for NDT in the course of maintenance can only be approved for those NDT methods/techniques used in the course of maintenance under the EASA scope of approval. For example if the AMO holds an EASA part-145 approval with A1 rating for aircraft XYZ and this aircraft does not have any X-ray inspection then the AMO cannot be approved for X-ray in the course of maintenance.

### 1.3 Responsible Level 3

*EN 4179 4.4.1*

This paragraph shall identify:

- the RL3 and the methods for which he/she is qualified as L3. When the AMO is using an external RL3 then this paragraph shall also identify the outside agency (name and contact details).
- The functions of the RL3, and for the method(s) for which the RL3 is not qualified as L3, this paragraph shall identify the name(s) of the L3 who will perform those functions.

If the AMO uses an external RL3, then the contract between the AMO and the outside agency detailing the functions of the RL3 shall be included in Part 3: Appendices to NDTWP.





## PART 2: QUALIFICATION AND CERTIFICATION PROCEDURES

### 2.1 Levels of qualification and certification

EN4179 5.1, 5.1.1, 5.1.2, 5.1.3, 5.1.4, 5.1.5

This paragraph shall indicate for each NDT method in the scope of approval of the AMO, the levels of qualification and certification that are going to be used and the functions assigned to each level.

If applicable, it shall detail the cases and/or tasks for which the L1 can perform the interpretation and evaluation of indications.

### 2.2 Training

EN4179 3.13, 3.16, 6.1, 6.1.1, 6.1.2, 6.1.3, 6.1.4, 6.1.5, 6.2, 6.2.2

This paragraph shall identify if the training will be provided internally and/or by an outside agency.

The AMO may select to use outside agency (ies) to provide training for one or several methods. A combination of internal and external training is also possible. For example the AMO uses an outside agency to provide the general training and the specific training is provided internally.

#### 2.2.1 Training course outlines

This paragraph shall include a list with the training courses for:

- the NDT training for each method and level of qualification used at the AMO.
- if applicable, the specific refresher training

The training course outlines (including syllabus, duration, type of training, reference material, etc.) shall be included in Part 3: Appendices to NDTWP.

#### 2.2.2 Training facilities

This paragraph shall identify the training facilities to be used for the theoretical part (classroom, meeting room, etc.) and for the practical part of the training (classroom, workshop, etc.).

*If an outside agency is used and the training is going to take place at the facilities of the outside agency, then this paragraph shall indicate the address of the outside agency.*

#### 2.2.3 Instructors

If the training is provided internally, then this paragraph shall:

- identify the qualification requirements for instructors;
- describe the process for approval of instructors. A list of instructors may be included in part 3: Appendices to the NDTWP or alternatively the RL3 may approve the instructors prior the training.

If an outside agency is used to provide the training, then this paragraph shall indicate that the instructors will be nominated by the outside agency.





## 2.2.4 Training certificate

If the training is provided internally, then this paragraph shall include the procedure to issue the training certificate by the AMO, this paragraph shall describe:

- the information contained in the certificate;
- the training attendance records to be checked before the issue of the certificate;
- the person signing the certificate

The format of the certificate shall be included in Part 3: Appendices to NDTWP

If an outside agency is used to provide the training then this paragraph shall specify the information to be contained in the certificate.

## 2.2.5 Procedures for assessment of previous training and equivalent training

This paragraph shall describe the procedure for the assessment of previous training and equivalent training. It should describe as a minimum:

- the assessment is done by the RL3;
- the information that must be available for the assessment (such as previous training certificates, syllabus of previous training, duration of previous training, etc.);
- how the result of the assessment will be documented;

Any person credited with previous training or equivalent training must always receive the missing portions of the training and NDT specific refresher training.

## 2.2.6 Health and safety training

This paragraph shall describe the health and safety training provided by the AMO to every person undergoing on the job training or seeking certification to perform NDT tasks. It shall describe:

- Health and safety training required for each method
- When the course will be delivered

The training course outlines (including syllabus, duration, type of training, reference material, etc.) shall be included in Part 3: Appendices to NDTWP.

## 2.3 Examination

### 2.3.1 Examination requirements

*EN4179 3.2, 3.10, 3.22, 3.30, 3.33, 4.1.4, 7.1, 7.1.1, 7.1.2, 7.1.3, 7.1.4, 7.1.4.1, 7.1.4.2, 7.1.4.3, 7.1.4.4, 7.2, 7.2.1, 7.2.2, 7.2.3*

This paragraph is applicable both for AMO performing internal examination and also for AMO using an outside agency to provide examinations.

This paragraph shall describe the requirements for the general, specific, additional other NDT methods and practical examination for each method and level, such as:

- Type of the examination is open book/ closed book
- The minimum number of questions for each method/ level
- The type of questions (open questions, multiple choice questions)
- The minimum number of test samples to be used for the practical examination
- The minimum score required to pass each individual examination.





- The minimum average score to be eligible for certification.
- If applicable, the procedure to credit the general examination

### 2.3.2 Internal examination procedures

This paragraph is applicable if the AMO performs internal examination. It shall describe:

- The preparation of questions and master answers
- The preparation of examination papers, whether the organisation has a question data bank or the questions will be prepared by the examiner before the examination
- The minimum score required to pass each examination.
- The time assigned to the examination.
- The nomination of examiners (the list of examiners can be included in Part 3: Appendices to NDTWP)
- The security of the examination (facilities where the examination will take place, maximum number of students per examination)
- The process to select the test samples used for the practical examination taking into account that the test samples cannot be known to the candidate
- The checklist used for the marking of the practical examination for L1,L2, L3 (this can be included in Part 3- Appendices to NDTWP)
- The security of test samples used for practical examination
- How to issue the examination certificate
- The procedures for re-examination

### 2.3.3 Use of an outside agency to provide examination

This paragraph is applicable if the AMO uses an outside agency for examination.

This paragraph shall:

- Identify the outside agency to be used to provide examination.
- List all necessary information to be provided to the outside agency before the examination, such as:
  - The name of the candidate, the method and techniques, the level of certification sought
  - The type of examination (general, specific, practical, additional “other NDT method” for L3)
  - The AMO written practice
  - The AMO work instructions, specifications, codes, equipment, operating procedures and test techniques the candidate may use in the performance of his/her duties with the employer.
- Specify the information required in the examination certificate from the outside agency after the examination, such as:
  - The name of the outside agency administering the examination
  - Name of the candidate
  - Name of the AMO
  - Applicable Written Practice and standards used for the examination
  - NDT Method, Level
  - Exam Date(s)
  - Certificate Issue Date
  - Score for the General examination, specific examination





- Method, Technique and score obtained for every test sample in the practical examination

## 2.4 Experience

EN4179 3.11, 3.21, 6.3, 6.3.1, 6.3.2

This paragraph shall detail the hours of experience required for each method and level of certification and how the experience will be obtained and documented. As a minimum 30% of the required experience shall be obtained by performing NDT tasks in actual working environment.

The format of the experience log book to be used to record the experience shall be included in Part 3: Appendices to NDTWP.

### 2.4.1 Procedure for assessment of previous experience

This paragraph shall describe the procedure for the assessment of previous experience and how this assessment will be documented.

## 2.5 Visual examination

EN4179 7.1.1

This paragraph shall describe the method and frequency of the near vision examination and the colour perception examination. It shall also identify:

- who will perform the visual examination,
- how the results of the visual examination will be documented, and
- how the expiry date of the visual examination will be monitored (by QA department, or by RL3, or by NDT manager, etc.)

The format of the visual examination report to be used to record the results of the visual examination shall be included in Part 3: Appendices to NDTWP

This para

## 2.6 Certification and recertification

EN4179 8.1, 8.3, 8.3.1, 8.3.2, 8.3.3, 8.4, 8.5, 8.5.1, 8.5.2, 8.5.2.1

### 2.6.1 Certification and recertification

This paragraph shall describe the procedure for the issue of the certification statement by the RL3. This paragraph shall include as a minimum:

- The requirements to be met by the candidate for initial certification and recertification.
- Minimum score for certification and recertification
- The validity period of the certification and recertification
- The format of the certification/recertification statement (this can be included in in Part 3: Appendices to NDTWP)

### 2.6.2 Continuous validity, suspension and revocation of the certification

This paragraph shall describe the conditions under which the certification shall be suspended or revoked and the procedure for the suspension, revocation and the reinstatement of the certification. The procedure must explain:







- Who (RL3 or AMO quality manager) is responsible for monitoring the continuous validity of the certification, such as the expiry date of the vision examination, expiry date of the annual maintenance, performing at least one NDT task in each method every 12 months, etc.
- how the suspension or revocation of the certification is notified to the affected staff
- how to reinstate a suspended certification.
- how to reinstate a revoked certification.

## 2.7 Annual maintenance

EN4179 8.6

This paragraph shall describe the procedure for the performance of the annual maintenance. The format for the annual maintenance report can be included in Part 3: Appendices to NDTWP.

## 2.8 Additional techniques

EN4179 3.32, 4.1.2

This paragraph shall describe the procedure to be used by the RL3 for establishing the qualification required for additional technique(s). The procedure shall describe how the RL3 will assess and document the need for additional training, experience and examination.

## 2.9 Record keeping

EN4179 4.1.6, 8.2, 8.2.1

This chapter shall describe the procedure for record keeping, this shall include:

- The records to be kept and for how long
- The record keeping system ( for example paper, electronic or a combination of different systems)
- Who is responsible for the record keeping system (this may be RL3 or the quality manager of the AMO)
- The obligation of the AMO to provide a copy of the records to the NDT staff on leaving the organization or at any point required by the NDT staff.





### PART 3: APPENDICES TO THE WRITTEN PRACTICE

Examples of documents that could be included as appendices to the written practice

- Contract between AMO and external RL3
- Training course outlines
- Health and safety training
- List of instructors
- List of examiners
- Format of the training certificate
- Format of the experience log book
- Format of the visual examination
- Format of the certification/ recertification statement
- Format of the annual maintenance report





## 4. AMO Authorization





#### 4.1. General

##### **NDT without D1 Rating (“in the course of maintenance”).**

When the AMO intends to perform and release NDT tasks under another approved rating (e.g. as part of the maintenance carried out on aircraft under rating A1, engines under rating B1, components under a C rating) the NDT tasks are considered done in the “course of maintenance”. The various NDT methods/techniques to be used in the course of maintenance shall be listed in the MOE 1.9. The AMO can only list in the MOE 1.9 methods and techniques which are required under another rating (A-rating, B-rating, C-rating).

In the case of NDT without D1 rating, the AMO shall authorize NDT sign-off staff for each NDT method/technique listed in MOE 1.9 (NDT without D1 rating).

##### **NDT with D1 Rating.**

When the AMO intends to perform NDT tasks and release such tasks using an EASA Form 1, the rating D1 is necessary. Under the D1 rating, the capability to perform maintenance is determined by the “NDT method” listed in the approval schedule, regardless the specific aircraft, engine or component which is subject to the inspection method. The various NDT methods/techniques shall be listed in the MOE 1.9. In this case the AMO shall authorize NDT certifying staff (C/S) for each method/technique listed in MOE 1.9 (NDT under the D1 rating)

The AMO may be approved both for NDT with D1 rating and for NDT without D1 rating, in such a case the AMO shall authorize both NDT sign-off staff and NDT C/S.

#### 4.2. NDT sign-off staff

The AMO shall have procedures for the authorization of NDT sign-off staff. These procedures will be included in the MOE 3.11 and the authorization process shall be under the responsibility of the quality manager or the person designated by the quality manager.

NDT sign-off staff means that the person is authorized to perform the activities necessary to complete the NDT task and sign-off the work card, including:

- set up and standardize equipment;
- conduct system performance checks in accordance with instructions issued by the AMO;
- process parts, including any necessary preparation before and after inspection;
- interpret and evaluate indications; and
- document the results in the work card or NDT report as applicable.

##### **4.2.1. Issue of the initial NDT sign-off staff authorization**

The NDT sign-off staff shall have the following:

- a valid L2 certification statement issued in the last 12 months<sup>6</sup> by the RL3 for the methods and techniques for which he/she is going to be authorized, or in specific cases a L1 certification statement issued in the last 12 months by the RL3 for the methods, techniques and specific task or products for which he/she is going to be authorized,
- a valid near vision test and colour perception test
- Health and safety training in accordance with NDTWP
- HF training as required in MOE 3.13

<sup>6</sup> The certification statement is suspended if the person does not perform in the method for more than 12 months





- Training on the organisation procedures and MOE applicable to NDT activity as required in the MOE
- EWIS and Fuel Tank Safety training as required in MOE 3.14
- Satisfactory competence assessment as required in MOE 3.14
- a working knowledge of the language in which the NDT instructions and/or maintenance data are published AND English.

#### 4.2.2. Continuous validity of the NDT sign-off staff authorisation

The AMO must have a process to monitor the continuous validity of the NDT sign-off authorization. The initial authorization is valid as long as:

- The certification statement is not expired, suspended or revoked
- The near vision test and colour perception test are not expired
- The person has passed a satisfactory annual maintenance in the last 12 months
- The person has received continuation training as required in the MOE (organisation procedures, HF, EWIS, FTS)
- The person has passed a satisfactory competence assessment in accordance with the MOE

#### 4.3. NDT certifying staff (NDT C/S)

The AMO with D1 rating shall have procedures for the authorization of NDT C/S. These procedures shall be included in the MOE 3.4.

NDT certifying staff means that the person is authorised to perform the activities necessary to complete the NDT task and issue a release to service, including:

- set up and standardize equipment;
- conduct system performance checks in accordance with the applicable process standard;
- process parts including any necessary preparation before and after inspection;
- interpret and evaluate indications ;
- document the results in the work card or NDT report as applicable; and,
- Issue a release to service detailing the work performed and the results.

##### 4.3.1. Issue of the initial NDT C/S authorisation

The NDT C/S shall have:

- a valid L2 certification statement issued in the last 12 months by the RL3 for the methods and techniques for which he/she is going to be authorized; or in specific cases a L1 certification statement issued by the RL3 for the methods, techniques and specific products or task for which he/she is going to be authorized;
- a valid near vision test and colour perception test;
- health and safety training as required in the NDTWP
- a training on human factors referred to in module 9 of Appendix I to Annex III (EASA Part-66).
- a training on aviation legislation referred to in module 10 of Appendix I to Annex III (EASA Part-66)
- 2 years of aeronautical experience in the field of aviation maintenance including at least 12 months of practical experience in NDT maintenance (as trainee or level 1 or level 2 or level 3)
- HF training as required in MOE 3.13
- training on the organisation procedures and MOE applicable to NDT activity as required in the MOE.
- EWIS and Fuel Tank Safety training as required in MOE 3.14





- satisfactory competence assessment as required in MOE 3.14
- a working knowledge of the language in which the maintenance data is published AND English.
- more than 21 years of age, and
- 6 months of recent NDT experience during the 24 months prior to the issue of the C/S authorisation.

For further guidance, refer to the *“Foreign Part 145 –demonstration of 6/24 months maintenance experience, UG.CAO.00128-xxx”*

#### 4.3.2. Continuous validity of the NDT C/S authorization

The AMO shall have a process to monitor and ensure the continuous validity of the NDT C/S authorization. The initial authorization is valid as long as the following conditions are met:

- The certification statement is not expired, suspended or revoked.
- The near vision test and colour perception test are not expired
- The NDT C/S has received continuation training within the last 24 months including Human Factors, FTS, EWIS and MOE as applicable.
- The NDT C/S has 6 months of recent NDT experience during any consecutive 24 months period. The experience will be counted in total for all the NDT methods and techniques for which the individual is authorised.
- The NDT C/S has passed satisfactory competence assessment as required in MOE 3.14 within previous 12 months.

For further guidance, refer to the *“Foreign Part 145 –demonstration of 6/24 months maintenance experience, UG.CAO.00128-xxx”*

#### 4.4. Competence assessment of NDT staff

The procedure for competence assessment of NDT C/S and NDT sign-off staff shall be included in MOE 3.14. The aim of the assessment is to ensure compliance of the NDT sign-off staff and NDT C/S with the relevant EASA Part 145 requirements, with EN4179, with the criteria defined in this user guide and to ensure that each NDT C/S and NDT sign-off staff possesses the expected competence(s) associated to his/her job function (proposed scope of work and level of maintenance). This assessment shall also take into consideration attitude and behaviour.

The competence assessment is required before granting an initial EASA Part-145 C/S or sign-off staff individual authorisation, to extend the scope of an issued authorisation to add new methods or techniques and to ensure the continuous validity of the C/S and sign off authorisation.

As a consequence the maintenance organisation shall demonstrate through a competence assessment that the NDT C/S or sign-off staff:

- Meets the qualification criteria addressed in 4.2 or 4.3;
- Has the relevant knowledge, skills and ability to perform the maintenance tasks related to his/her job function including the relevant language knowledge;
- Is able to perform the activities included in the scope of its authorisation (this may include to complete the NDT task and document the results properly).

In the case of initial authorisation or extension of the scope of an already existing authorisation (add new methods/ techniques), the competence assessment must:

- Be specifically tailored to the methods/ techniques intended to be covered by the authorization;





- include evaluation of “On the Job Performance” and /or “testing of knowledge” by appropriately qualified personnel;

In addition, the following shall be taken into account when doing the competence assessment of NDT staff

- The annual maintenance is an “on the job assessment” of the technical proficiency of the NDT staff for each method for which they are authorized to inspect parts. The AMO shall describe in MOE 3.14 which elements of the competence assessment are reviewed during the annual maintenance, such as for example:
  - Ability to use, control and be familiar with required tooling and/or equipment
  - Ability to confirm proper accomplishment of maintenance tasks
  - Ability to understand work orders, work cards and refer to and use applicable maintenance data
- It is recommended that the competence assessment form contains an open text field where the person responsible for the assessment records the questions raised, comments or any other information useful to support the recommendation for the pass/fail result. A “box-ticking” exercise would be pointless.





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4.5. Summary table for EASA PART-145 NDT C/S and sign-off staff qualification criteria

			NDT C/S	NDT sign-off staff
Initial authorisation or extension of the authorisation	NDT requirements	NDT certification	<ul style="list-style-type: none"> <li>valid L2 certification statement issued within the 12 months<sup>7</sup> previous of the issue of the C/S or sign off staff authorisation by the RL3 for the methods and techniques for which the candidate is going to be authorized; or,</li> <li>in <u>specific cases</u> a valid L1 certification statement issued in the last 12 months<sup>8</sup> previous of the issue of the C/S or sign off staff authorisation by the RL3 for the methods, techniques and specific products or task for which the candidate is going to be authorized.</li> </ul>	
		Visual acuity examination	<ul style="list-style-type: none"> <li>Valid near vision test</li> <li>Valid colour perception test</li> </ul>	
		Aeronautical experience	2 years of aeronautical experience in the field of aviation maintenance including at least 12 months of practical experience in NDT maintenance as L1, L2 or L3 <sup>9</sup>	n/a
	Technical training	Additional training	MOE and internal procedures applicable to NDT C/S (including issuance of EASA form 1, documenting results, etc.)	MOE and internal procedures applicable to NDT sign-off staff (including signing off tasks, documenting results, etc.)

<sup>7</sup> The certification statement is suspended if the person does not perform in the method for more than 12 months

<sup>8</sup> The certification statement is suspended if the person does not perform in the method for more than 12 months

<sup>9</sup> If the L3 is authorised to process parts and interpret and evaluate indications and document results.







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			<ul style="list-style-type: none"> <li>Initial Human Factor training According to 145.A.30(e) and GM 1 145.A.30 (e) syllabus;</li> </ul> <p>In addition, where needed, appropriate training on:</p> <ul style="list-style-type: none"> <li>Fuel Tank Safety items, CDCCL level 1, or level 2 after 31/12/2010, (refer to Appendix IV to AMC to 145.A.30(e) and 145.B.10(3) for further details);</li> <li>Electrical Wiring Interconnection System (refer to AMC 20-22 for further details);</li> <li>Any additional training(s) justified during the assessment performed by the maintenance organisation (e.g. aviation legislation, familiarisations with aircraft/ engine/ component maintenance, etc.)</li> </ul>
General training and experience	<b>HF and Aviation legislation training</b>	Human Factor M9 and aviation Legislation M10 training as detailed in the EASA Part- 66.	n/a
	<b>Maintenance experience</b>	6 months of recent NDT experience during the 24 months prior to the issue of the C/S authorisation	n/a
Other	<b>Language knowledge</b>	Working knowledge of the language in which the maintenance data is published AND working knowledge of English for documenting the results and issuing the CRS (and for EU Airworthiness directives if required).	Working knowledge of the language in which the maintenance data is published AND working knowledge of English for documenting results (and for EU Airworthiness directives if required).
	<b>Competence assessment</b>	Documented competence assessment as required in MOE 3.14	





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		NDT C/S	NDT sign-off staff
Continued validity of the NDT C/S and sign off authorisations	<b>NDT requirements</b>	<ul style="list-style-type: none"> <li>• Verification that the NDT certification statement remains valid, and it is not expired, suspended or revoked</li> <li>• Valid annual maintenance</li> </ul>	
	<b>Visual acuity examination</b>	<ul style="list-style-type: none"> <li>• Valid near vision test</li> <li>• Valid colour perception test</li> </ul>	
	<b>Maintenance experience</b>	6 months of relevant NDT experience within each 24 months period	Evidence that the person has performed an NDT task in the particular method within the scope of his/her authorisation for the AMO in the previous 12 months.
	<b>Continuation training</b>	<ul style="list-style-type: none"> <li>• MOE continuation training</li> <li>• HF continuation training</li> <li>• EWIS continuation training (if applicable)</li> </ul>	
	<b>Competence assessment</b>	Documented competence assessment as required in MOE 3.14	





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4.6. Summary of assessment for EASA PART-145 NDT C/S and NDT sign-off staff

<b>Purpose of the Assessment</b> <input type="checkbox"/> Initial grant <input type="checkbox"/> Extension <input type="checkbox"/> Continuous validity <b>The competence assessment shall include evaluation of “On the Job Performance” and /or “testing of knowledge” by appropriately qualified personnel</b>				
<b>I QUALIFICATION</b>				
		NDT C/S and sign-off staff	Normally included in annual maintenance	<i>Open text field*</i>
I.1.	Refer to the Summary table (§4.5) for Foreign Part- 145 NDT C/S and sign-off staff qualification	X		
<b>II KNOWLEDGE</b>				
II.1.	Knowledge of applicable officially recognised standards	X		
II.2.	Knowledge of human factors, human performance and limitations	X		
II.3.	Knowledge of maintenance organisation capabilities, privileges and limitations	X		
II.4.	Knowledge of EASA Part-M, EASA Part-145 (and any other relevant regulations)	X		
II.5.	Knowledge of relevant parts of the MOE and associated procedures	X		
II.6.	Knowledge of safety risks linked to the working environment	X		
II.7.	Knowledge on CDCCL (when relevant)	X		
II.8.	Knowledge on EWIS (when relevant)	X		
II.9.	Knowledge of occurrence reporting system and understanding of the importance of reporting occurrences, incorrect maintenance data and existing or potential defects	X		
<b>III UNDERSTANDING</b>				
III.1.	Understanding of professional integrity, behaviour and attitude towards safety	X		
III.2.	Understanding of conditions for ensuring continuing airworthiness of aircraft and components	X		
III.3.	Understanding of his/her own human performance and limitations	X		
III.4.	Understanding of personnel authorisations and limitations	X		
III.5.	Understanding critical task	X		
<b>IV ABILITY</b>				
IV.1	Ability to supervise the performance of tasks carried out by non C/S personnel (i.e. mechaniC/S, etc.)	X		
IV.2	Ability to compile and control completed work cards	X		
IV.3	Ability to consider human performance and limitations.	X		
IV.4	Ability to determine required qualifications for task performance	X		
IV.5	Ability to identify and rectify existing and potential unsafe conditions	X		
IV.6	Ability to check and document proper accomplishment of maintenance tasks	X	YES	
IV.7	Ability to prioritize tasks and report discrepancies	X	YES	
IV.8	Ability to process the work requested by the customer	X	YES	
IV.10	Ability to properly process removed, uninstalled and rejected parts	X		





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IV.11	Ability to properly record and sign for work accomplished	X	YES	
IV.13	Ability to understand work orders, work cards and refer to and use applicable maintenance data	X	YES	
IV.14	Ability to use information systems	X		
IV.15	Ability to use, control and be familiar with required tooling and/or equipment	X	YES	
Adequate communication and literacy skills: The NDT C/S and NDT sign-off staff shall be able to demonstrate a working knowledge of the language in which the maintenance data is published and English.				
Note: This list shall not be considered as exhaustive. It remains the responsibility of the maintenance organisations to adjust it. *It is recommended that the assessment form contains an open text field where the person responsible for the assessment records the questions raised, comments or any other information useful to support the recommendation for the pass/fail result.				





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## 5. Appendices to the UG



**Appendix 1: Example marking checklist for practical examination L1/ L2**

AMO name		NDT Written practice reference:	
Name:		Date:	
Method:	Level: 1 / 2	Technique:	
Procedure/ written instruction:		Test sample:	

Subject	Max score	Score achieved
Understanding of procedure/ work instruction	A	a
System performance checks	B	b
Equipment set-up	C	c
Part preparation	D	d
Safety precautions	E	e
Step by step performance	F	f
Interpreting results	G	g
Writing test report	H	h
Sub-total score	$A+B+C+D+E+\dots=100$	$a+b+c+d+e+\dots= \mathbf{S}$
All discontinuities detected? If YES then D=1 If NO then D=0		<b>D</b>
Final score = $\mathbf{S} \times \mathbf{D}$ (final score $\geq 70$ , then this examination is PASS)		

Examiner:	Signature examiner
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## Appendix 2: Example visual acuity examination report

AMO name	NDT Written practice reference:
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Name of the person tested:

Date of test:

### Near vision test

Visual correction wear during test: YES/ NO

Method used:

Result:

### Colour perception test

Method used in the colour perception test:

Result:

Name of examiner:	Signature examiner:
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Expiry date of near vision test:	DD/MM/YYYY (12 months after the date of the test)
Expiry date of colour perception test	DD/MM/YYYY ( 5 years after the date of the test)





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### Appendix 3: Example experience log-book

Name:  
Method:  
Level sought: L1 / L2 / L3  
Organisation:  
Name of RL3 reviewing and accepting the experience on this page:  
Date reviewed by RL3  
Signature of RL3:

ID	Date	Operation performed (inspection of test sample/ equipment set-up/ system performance check/ part processing/ result interpretation)	NDT task or work instruction used	A/C Reg or component p/n s/n	Work order reference	Time (Hours)	Supervisor (if the task is performed as L1 and no supervisor is required please indicate "n/a L1 task")







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### Appendix 4: Example examination report

AMO name	NDT Written practice reference:
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Name:	Date:
Method:	Level: 1 / 2 / 3

Exam type	Score required	Score achieved	Re-examination
General	≥ 70%	a	
Specific	≥ 70%	b	
Practical			
Sample 1: Technique 1	≥ 70%	d	
Sample 2: Technique 2	≥ 70%	e	
Sample 3: Technique 3	≥ 70%	f	
Preparation of work instruction	≥ 70%	g	
Average score for certification	≥ 80%		

Name of Examiner (s):	Signature RL3
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## Appendix 5: Draft guidance definition of methods and techniques

The table attached in the next page is a draft document prepared by the ANDTBF and used in this UG as guidance.





ANDTBF action table and reference 07/2018

draft\_06: GW

date: 27. Sept. 2019

Examples to comply:

Examples in Method and Technique		Examples in Application	Examples in Equipment	RL3 to identify level, method, technique used by the employer
UT	Contact Technique	- single channel testing	- manual	UT Level 1; 2 or 3 <i>Contact Technique; Trough Transmission (C-Scan); Phased Array, (A-,B-,C-,S-Scan) Inspection on metallic and composite/bonded parts.</i>
	Immersion technique		- manual	
	Squirter Technique	- single channel testing	- semi-automated	
	Phased Array	- multi channel testing	- automated	
ET	Conductivity Testing	- spot testing probes	- manual	ET Level 1; 2 or 3 <i>Application of low, mid and high frequencies, in application with spot probes, sliding, rotating and array probes, mobile and stationary equipment.</i>
	High frequency	- sliding probes	- manual	
	Mid frequency	- rotating probes	- semi-automated	
	Low frequency	- array probes	- automated - multi frequency	
MT	Electromagnetic Yokes		- localized application	MT Level 1; 2 or 3 <i>Application of direct, in-direct and inducted magnetization in application with stationary AC, FWDC, HWDC equipment</i>
	Direct Magnetization	- dry particles	- stationary	
	Indirect Magnetization	- continuous wet	- AC, HWDC, FWDC	
	Induced Current Magnetization	- residual fields		
PT	Solvent Remover		- localized application	PT Level 1; 2 or 3 <i>Application of type I penetrants, method A, C and D, in combination with form -a- and form -d- developer.</i>
	Water washable	- developer form a	- manual	
	Post emulsified hydrophilic	- developer form d	- semi-automated	
	Post emulsified lipophilic		- automated	
RT	Film technique (analogue)	- stationary / in-motion	- analogue films	RT Level 1; 2 or 3 <i>Application of x-ray tubes in combination with analogue imaging and digital detector arrays on metallic and composite and bonded parts.</i>
	Non-film technique (DDA)	- dense or light metals	- Digital Detector Array	
	Non-film technique (CR)	- castings or welds - bonded parts	- Imaging plate/scanner	
IRT	Transient Thermography	- Detection of Moisture in composite parts	- manual	IRT Level 1; 2 or 3 <i>Application of transient- (e.g. heat gun), impulse- (e.g. time-controlled heat source) and Lockin method (e.g. Ultrasonic pulse excitation). Application on metallic and composite parts.</i>
	Impulse Thermography	- Detection of subsurface defects	- stationary	
	Lockin Thermography			

