



**Recommended Practice of the  
Finnish Aerospace Non-Destructive Testing  
Board (FANDTB)**

Doc number: FANDTB-RP-02

Issue:08 Rev: 1

Date: 27.04.2021

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## DOCUMENT DETAILS

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## 1. Scope

### 1.1 Purpose

This Document establishes the minimum requirements for the qualification and certification of personnel performing non-destructive testing (NDT) in Finland in the aerospace manufacturing, service, maintenance and overhaul industries.

### 1.2 Applicability

This document applies to personnel using NDT methods to test and/or accept materials, products, components, assemblies or sub-assemblies used in the Aerospace Industries in Finland.

This document also applies to personnel:

- directly responsible for the technical adequacy of the NDT methods used,
- who approve NDT procedures and/or work instructions,
- Who audit NDT facilities, or who provide technical NDT support or training in Finland.

#### 1.2.1 Implementation

This document will be implemented and become effective after the recognition (in writing) by the Finnish Transport Safety Agency/Civil Aviation Authority of Finland and the approval by the Finnish Aerospace NDT Board.

Personnel who are currently certified under other certifying schemes like EN 4179/NAS410 need not recertify to the requirements of this document until their current certification expires.

## 1.3 Methods

### 1.3.1 Common Methods

This document contains detailed requirements for the following common NDT methods:

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

*#: Indicates methods with Method Level III's I.A.W EN4179 or this document currently in Finland.*

### 1.3.2 Other Methods

When invoked by engineering, quality, cognizant engineering organization or prime contractor requirements, this standard applies to other current and emerging NDT methods used to determine the acceptability or suitability for intended service of a material, part, component, sub-assembly or assembly.

Such methods may include, but are not limited to, acoustic emission, neutron radiography, leak testing, holography and shearography. Shearography is considered as emerging method according to NAS410 Rev 5 and prEN4179 2020.



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The requirements for personnel training, experience, and examination for these other methods shall be established in accordance with [6.4](#) and shall be documented by the employer.

## 2. Reference Documents

**SFS-EN 4179:** Aerospace Series - Qualification and Approval of Personnel For Non-Destructive Testing

**SFS-EN ISO 9712:** Non-Destructive Testing - Qualification and Certification of NDT Personnel

**NAS 410:** National Aerospace Standard – Certification and Qualification of Nondestructive Test Personnel

**SFS-EN ISO 18490:** Nondestructive Testing – Evaluation of Vision Acuity of NDT Personnel

## 3. Acronyms and Definitions

### 3.1 Acronyms

**FANDTB:** Finnish Aerospace Non-Destructive Testing Board

**ANDTBF:** Forum for National Aerospace NDT Boards

**CAA Finland:** Finnish Transport Safety Agency/Civil Aviation Authority of Finland

**EASA:** European Aviation Safety Agency

**Part 145:** The requirements to be met by an organization to qualify for the maintenance of Aircraft and components

**Part 147:** The requirements to be met by an organization seeking approval to conduct training and examination as specified in Part-66.

**EFNDT:** European Federation for Non-Destructive Testing

### 3.2 Definitions

For the purposes of this document, the following terms and definitions apply.

#### 3.2.1 Basic Examination

An examination utilized to verify a **Level 3** candidate's knowledge of other NDT methods at Level 2 skill level, and the candidate's knowledge in materials technology, manufacturing processes in the aerospace sector, and the understanding of EN 4179 standard and this document.

#### 3.2.2 Certification

A written statement by an employer that an individual has met the applicable requirements of this document.

#### 3.2.3 Closed Book Examination

An examination administered without access to any reference materials.





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## 3.2.4 Cognizant Engineering Organization

The engineering or NDT organization of the prime contractor, OEM (Original Equipment Manufacturer), or end user authorized to make NDT-related decisions and give NDT-related approvals.

## 3.2.5 Direct Observation

When the observer is able to adequately view the NDT process in a manner that permits uninterrupted, visual and verbal two-way contact with the trainee.

## 3.2.6 Direct Readout Instrument

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.

## 3.2.7 Documented

The condition of being recorded in written or electronic form.

## 3.2.8 Employer

An organization employing or contracting the services of one or more individuals who perform NDT. Self-employed individuals are included in this definition.

## 3.2.9 Evaluation

A review following interpretation of the indications noted during an NDT inspection to determine whether the indications meet specified acceptance criteria or to determine the significance of the indication.

## 3.2.10 Examination

Formal, controlled, documented testing conducted in accordance with a documented written practice to verify a candidate's visual capability, skill or knowledge of an NDT method.

## 3.2.11 Examiner

A Level 3 certified according to EN4179 or NAS410 and designated by the Responsible Level 3 to administer all or part of the qualification process in the NDT method(s) in which the Examiner is certified.

## 3.2.12 Experience

Actual performance of an NDT method conducted in the work environment resulting in the acquisition of knowledge and skill. *This does not include formal classroom training*, but may include laboratory and on-the-job training as defined by the employer's written practice.



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## **3.2.13 Formal Education**

Engineering or science studies at a technical school, college, or university.

## **3.2.14 Formal Training**

An organized and documented program of learning activities designed to impart the knowledge and skills necessary to be qualified according to EN4179 or NAS410. Formal training may be a mix of classroom, practical and programmed self-instruction as approved by the Responsible Level 3 or Examiner.

## **3.2.15 General Examination**

A written examination addressing the basic principles and theory of an NDT method.

## **3.2.16 Indication**

The response or evidence of a condition resulting from an NDT inspection that requires interpretation.

## **3.2.17 Instructor**

An individual designated or approved by the Responsible Level 3 or Examiner to provide training for NDT personnel.

## **3.2.18 Interpretation**

The determination of whether indications are relevant or non-relevant.

## **3.19 Method**

One of the disciplines of non-destructive testing (e.g. ultrasonic, radiography, etc.) within which different techniques may exist.

## **3.2.20 National Aerospace NDT Board (NANDTB)**

An independent aerospace organization representing a nation's aerospace industry that is chartered by the participating prime contractors and recognized by the nation's regulatory agencies to provide or support NDT qualification and/or examination services.

## **3.2.21 NON-FILM RADIOGRAPHY**

Radiographic imaging that does not use a film based recording medium. Non-Film radiography includes, but may not be limited to, Computed Radiography, Digital Radiography, Radioscopy, and Computed Tomography.

## **3.2.2 On-The-Job Training (OJT)**

Training in the work environment to gain experience in learning instrument set-up, equipment operation, applying the process, and recognition, interpretation and evaluation of indications under appropriate technical guidance.



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## **3.2.23 Open Book Examination**

An examination administered with access to specific reference material that is provided with or referenced in the examination.

## **3.2.24 Operating Approval**

Written statement issued by the employer, based upon the scope of certification, authorizing the individual to carry out defined tasks. Such authorization can be dependent on the employer having provided job or task-specific training.

## **3.2.25 Outside Agency**

An independent company or organization outside the employer who provides NDT services to implement the requirements of this document, such as training and examination of NDT personnel. Consultants and self-employed individuals are included in this definition.

## **3.2.26 Practical Examination**

An examination to demonstrate an individual's ability to conduct an NDT method as used by the employer. Questions and answers need not be written, but a checklist must be used and observations and results must be documented.

## **3.2.27 Prime Contractor**

An organization having overall responsibility for design, control and delivery of a system, component or product.

## **3.2.28 Procedure**

A written general "how to" instruction for conducting a given process. Procedures are then used to develop work instructions, as defined in 3.2.35.

## **3.2.29 Qualification**

The skills, training, knowledge, examinations, experience and visual capability required for personnel to properly perform to a particular level.

## **3.2.30 Responsible Level 3**

The Level 3 designated by the employer with the responsibility and authority to ensure that the requirements of this document are met and to act on behalf of the employer.

## **3.2.31 Specific Examination**

A written examination to determine an individual's understanding of operating procedures, codes, standards, product knowledge, test techniques, equipment and specifications for an NDT method as used by the employer.

## **3.2.32 Sub-Contractor**

An organization responsible to the prime contractor for the manufacture or maintenance of aerospace products. For the purposes of this document, this includes suppliers and processors.



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## 3.2.33 Technique

A category within a method as defined in the written practice by the employer.

## 3.2.34 Test Sample

A part or image containing one or more known and documented natural or artificial discontinuities, flaws or conditions used in the practical examination to demonstrate the candidate's proficiency in an NDT method. Test samples can refer to actual hardware, fabricated test parts, or, when applicable, images of actual hardware such as radiographs.

## 3.2.35 Work Instruction

A document detailing the NDT technique and testing parameters to be used for the inspection of a specific component, group of parts (e.g. "aluminium extrusions" or "steel brackets"), or assembly. These are sometimes referred to in the industry as "technique sheets" or "data cards". Such work instructions are based on procedures defined in 3.2.28.

## 3.36 Written

Retrievable electronic or hard copy.

## 3.37 Written Practice

A document that describes an employer's requirements and methodology for controlling and administering the NDT personnel qualification and certification process.

## 4. General requirements

### 4.1 Written Practice

#### 4.1.1 Qualifications and Certifications

The Responsible Level 3 of the company shall develop and maintain a written practice for the qualification and certification of NDT personnel that meets the requirements of this document.

The written practice shall address the procedural details necessary for the employer to implement an NDT qualification and certification program and shall include, the details of the NDT qualification and certification process, including:

- The levels of qualification and certification used by the employer
- Personnel duties and responsibilities
- Training and experience requirements
- Certification and recertification requirements
- Records and record keeping requirements
- Requirements for expiration, suspension, revocation and reinstatement of certifications
- Process for annual proficiency review

#### Note:

The written practice shall be approved by the Responsible Level 3.



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The written practice shall be available for review by the employer's customer(s) and regulatory agencies.

## 4.1.2 Additional Requirements

The written practice shall include any additional requirements levied by the employer or cognizant engineering organization, such as additional certification levels or increased experience requirements.

## 4.1.3 NDT Techniques

The written practice shall include the specific technique(s) within each method and the actions to be taken concerning additional training and experience, as well as the written and practical testing, when additional techniques are introduced for a currently certified individual.

## 4.1.4 Training Outlines

The written practice shall reference or include the NDT training outlines used by the employer. If an outside agency is used to provide training, the Responsible Level 3 shall verify that the training meets the employer's requirements.

## 4.1.5 Examination Practices

The written practice shall include the designation of the individual(s) or organization(s) responsible for administering examinations, the number of examination questions to be administered, and the specific visual acuity examination method to be used. If required, the use of a general examination for recertification shall be documented in the written practice.

## 4.1.6 Administration

The written practice shall include the identification of the individual(s) or organization(s) responsible for administering and maintaining all or part of the employer's certification program.

## 4.1.7 Records

The written practice shall include the designation of the individual(s) or organization(s) responsible for maintaining the qualification and certification records and where such records shall be kept.

## 4.2 Methods

For the common methods listed in [1.3.1](#), the minimum requirements for training, experience and examination are detailed in [Sections 6, and 7](#) of this standard. These requirements shall serve as a guideline for other current or emerging methods as defined in [1.3.2](#).

## 4.3 Responsibility

### 4.3.1 General

The employer is responsible for the implementation of, and compliance with, this document and for certifying qualified personnel.

In addition, the prime contractor shall be responsible for compliance to this standard by their sub-contractors.



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Employers using outside agencies shall be responsible for assuring that the appropriate requirements of this document are met.

The employer is solely responsible for the certification of its own employees and cannot certify employees for another employer/s.

Individuals cannot qualify themselves.

Self-employed individuals may certify themselves provided they have a written practice and have been qualified to the requirements of this standard by another individual certified to Level 3 in accordance with this standard.

### 4.3.2 Responsible Level 3

The employer shall identify in writing a "Responsible Level 3" to act on its behalf in matters regarding the NDT qualification and certification process.

The Responsible Level 3 shall be certified in accordance with this document as a Level 3 in one or more NDT methods and shall have a thorough knowledge of the written instructions, codes, specifications and standards used by the employer.

He/she shall also have a thorough knowledge of the materials, components, product technologies, NDT methods and NDT techniques used by the employer.

Additional Examiners as defined in this document may be identified and delegated in writing as necessary to provide coverage for all methods used by the employer.

The Responsible Level 3 may be an outside agency but in this case he/she can only qualify personnel, as only the employer can certify personnel.

The Responsible level 3 shall be responsible for implementation of this document and the overall administration of the qualification and certification program.

### 4.3.3 Outside Agency

An employer may use a Level 3 certified in accordance with this document from an outside agency to develop a certification program,

- act as the Responsible Level 3,
- Examine NDT personnel or perform any other qualification or Level 3 function.

An outside agency may qualify, but not certify personnel.

The employer shall document the suitability of any outside agency selected to perform any function in meeting the requirements of this document.

This documentation shall be of sufficient detail to justify the outside agency's ability to perform the required Level 3 function(s).

The Finnish Aerospace NDT Board shall also maintain a list of approved external institutes and agencies that meet the criteria set out in this Document, EN 4179 and/or NAS 410 see Annex C.



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## 5. Qualification and Certification Levels

### 5.1 Levels of Qualification and Certification

#### 5.1.1 General

The four basic levels of certification are, Level 1, Level 2 Limited, Level 2 and Level 3.

The employer may *subdivide*, add or limit levels as appropriate, but cannot eliminate or reduce the minimum requirements for each level.

If the employer does not wish to use all of the levels, those levels to be used shall be documented in the employer's written practice.

Where other variations or subdivisions are implemented, the requirements and responsibilities shall also be detailed in the employer's written practice.

NDT personnel shall not independently perform the functions listed in 5.1.3, 5.1.4, 5.1.5 and 5.1.6 if not certified to the appropriate level in the applicable technique/method.

**Note:** Certifications and qualifications issued by qualifying agencies under the control of other National Aerospace Boards shall be recognized, if these Boards are full members of the **European Federation for Non-Destructive Testing (EFNDT)**. The company's responsible Level 3 has the final responsibility to ensure that such certifications and qualifications meet the requirements of this document or that of EN4179/NAS 410 standards.

#### 5.1.2 TRAINEE

An individual who is documented as participating in a training program for an NDT method and is in the process of becoming qualified for certification to Level 1, Level 2-Limited or directly to Level 2 shall be considered a trainee.

In the technique/method in which they are preparing for certification, trainees shall:

- Be documented as a trainee and be actively participating in a training program for a stated NDT method for a limited and specified period of time.
- 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.

#### 5.1.3 Level 1

In the method in which certified, Level 1 individuals shall:

- Be able to follow work instructions.
- Have the skills and knowledge to process parts, document results and perform equipment standardization in accordance with approved work instructions.
- Have the skills and knowledge to carry out any necessary preparation of parts before or after inspection in accordance with approved work instructions.



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- Have the skills and knowledge to conduct system performance checks in accordance with the applicable process standard.
- Receive guidance or supervision from a certified Level 2 or Level 3 in that method when necessary.
- When specified in the written practice and approved by the Responsible Level 3, may perform interpretations and evaluations of specific product(s) or product form(s) for acceptance or rejection in accordance with approved work instructions.

## 5.1.4 Level 2-Limited (Also see Annex A)

In the technique within the method in which certified, Level 2- Limited individuals shall:

- Have the skills and knowledge to set up and standardize equipment, process parts, interpret and evaluate for acceptance or rejection, and document results.
- Be thoroughly familiar with the scope and limitations of the techniques in the method.
- Have the skills and knowledge to conduct system performance checks in accordance with the applicable process standard.
- Be familiar with the codes, standards, and other contractual documents that control the method as used by the employer.
- Have a basic knowledge of relevant product manufacturing and inspection technology.
- When specified in the written practice, have a basic knowledge of aircraft or vehicle maintenance.

## 5.1.5 Level 2

In the method in which certified, Level 2 individuals shall:

- Have the skills and knowledge to set up and standardize equipment, process parts, interpret and evaluate for acceptance or rejection, and document results.
- Be thoroughly familiar with the scope and limitations of the technique/method.
- Have the skills and knowledge to conduct system performance checks in accordance with the applicable process standard.
- Be capable of providing the necessary guidance and/or supervision to trainees and Level 1 personnel.
- Be familiar with the codes, standards, and other contractual documents that control the method as used by the employer.
- When specified in the written practice, be capable of developing work instructions from approved general procedures. Such work instructions shall require final approval by a Level 3 certified in the method.
- Have a basic knowledge of relevant product manufacturing and inspection technology.
- When specified in the written practice, have a basic knowledge of aircraft system maintenance.





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## 5.1.6 Level 3

In the method in which certified, Level 3 individuals shall:

- Have the skills and knowledge to interpret codes, standards, and other contractual documents that control the NDT method(s).
- Be capable of assuming technical responsibility for the NDT facility and staff.
- Be capable of selecting the method and technique for a specific inspection.
- Be capable of preparing and verifying the adequacy of procedures and work instructions. Approve NDT procedures and work instructions for technical adequacy.
- Have a general knowledge of other NDT methods and product manufacturing and inspection technologies used by the employer.
- When specified in the written practice, have a basic knowledge of aircraft or vehicle maintenance.
- Be capable of providing or directing training, examination, and certification of personnel. Conduct NDT for the acceptance of parts and document the results if a demonstration of proficiency in this ability was included in the practical examination.
- When required by the written practice, be capable of auditing outside agencies to ensure the requirements of the written practice are met.

## 5.1.7 Auditor

Personnel performing technical NDT audits, surveys or assessments shall have the training, skills and knowledge to understand the processes and procedures utilized in the application of NDT processes.

The individual shall be familiar with the applicable codes, standards, and other contractual documents that control the applicable method(s). The auditor shall be nominated by the company's responsible level III person or FANDTB.

## 6. Training and Experience

### 6.1 Training

#### 6.1.1 General

Candidates for certification to all levels shall complete sufficient formal training to become proficient with the principles and practices of the applicable test method and technique(s) and be capable of carrying out the duties specified in Section 5. Formal training shall be conducted prior to, or in conjunction with, on-the-job training.

*All completed NDT training shall be documented.*

The minimum training hours for Level 1, Level 2 and Level 2-Limited are provided in Table 1 and Table 1A for the specified NDT methods.

Individuals cannot be certified to Level 3 without prior certification to Level 2 in the method.

40 additional hours of training is required for current certified Level 3 radiography personnel transitioning to either film or non-film radiography.



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General, specific and practical training may be obtained with the employer or outside agency but shall always be supplemented by practical on-the-job training with the employer.

**Table 1 – Minimum Formal Training Hours for Level 1, Level 2-Limited and Level 2**

	Level 1	Level 2 with previous Level 1 certification	Level 2 without previous Level 1 certification	Level 2-Limited
PT	16	16	32	32
MT	16	16	32	32
ET	40	40	80	80
UT	40	40	80	80
IRT	20	40	60	60
RT Film or Non-Film	40	40	80	N/A
RT Film & Non-Film	60	60	120	N/A

**Table 1A – RT Formal Training Hours for Transition to Film and Non-Film**

Additional Formal Training Hours		
Current Level 1	Current Level 2	Current Level 1 to Level 2 Film & Non-Film
20	40	80

## 6.1.2 Training Outlines

All training shall be conducted in accordance with a detailed outline approved by FANDTB. The outline shall include a list of references from which the training material is derived.

As a minimum the training shall include:

- Basic theory.
- Test principles, including choice of NDT methods, relevance to different materials and part and test variables.
- Product forms and materials; defect formation and characterization.
- Equipment operation and standardization.
- The importance of process controls.
- The importance of appropriate processing steps and parameters.



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- Safety.
- Applicable techniques and the advantages and disadvantages of each.
- Limitations and capabilities of each method and technique.
- Applicable specifications, codes, operating procedures and work instructions.
- If applicable, evaluation, interpretation and documentation of inspection results.

If an outside agency is used to provide additional special training, the Responsible Level 3 shall verify that the training meets the employer's requirements.

## 6.1.3 Previous Training for Level 1 and Level 2

For personnel credited with previous training, or personnel not certified within 12 months of their training, refresher training must be provided.

Previous training must be documented to be accepted by the employer. As a minimum, refresher training shall cover products, equipment set-up, operation and standardization, specific operating procedures, applicable techniques, interpretation and evaluation of NDT results, safety, and applicable codes, standards and specifications.

For documentation of previous training, records other than original records may be accepted if adequacy and equivalency have been determined to be acceptable by the Responsible Level 3 or Examiner.

## 6.1.4 Equivalent Training Level 1 and Level 2

For personnel previously certified under NAS410, EN 4179 or other recognized NDT qualification program, the adequacy and equivalency of their previous training to the requirements of Table 1 and Table 1A shall be determined and documented by the Responsible Level 3 or Examiner.

All or a portion of previous hours may be accepted as applicable.

## 6.1.5 Health and Safety Training

All regulations relating to hazardous substances, accident prevention and safe working practices shall be strictly adhered to.

Safety-related training requirements shall be determined in accordance with local codes and regulations.

Prior to certification, all candidates seeking radiography qualification shall have received instruction on the hazards and safety requirements associated with ionizing radiation and be knowledgeable of, and comply with, the applicable regulations and laws.

## 6.2 Training and Examination Personnel

### 6.2.1 Responsible Level 3 (FANDTB approved/Recognized)

The Responsible Level 3 shall maintain overall control and cognizance over the NDT training program, including designating or approving qualified Examiners, instructors and outside agencies.



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## 6.2.2 Examiners (FANDTB approved/Recognized)

When necessary, Examiners shall be designated or approved in writing by the Responsible Level 3. All Examiners shall be certified in accordance with this recommended practice. As determined and documented by the Responsible Level 3, an Examiner can prepare, administer and grade written or practical NDT examinations, and administer all or part of the qualification process in the method in which he/she is certified.

## 6.2.3 Instructors (FANDTB approved/Recognized)

Instructors shall have the skills and knowledge to plan, organize, and present classroom training and practical exercises in accordance with approved training outlines. Instructor shall be qualified and certified to Level 3 according to EN4179, NAS410 or ISO 9712. Instructors shall be designated or approved by the Responsible Level 3 or Examiner.

## 6.2.4 Out-side Agencies (FANDTB approved/Recognized)

When an outside agency is used, the outside agency shall provide the employer with the names, evidence of qualifications and, if applicable, evidence of certifications held by the personnel conducting the training and examination.

## 6.3 Experience

### 6.3.1 General

Candidates for certification to Level 1, Level 2-Limited, Level 2 or Level 3 shall have sufficient practical experience to assure that they are capable of performing the duties of the level for which certification is sought.

The minimum experience requirements for Level 1, Level 2-Limited and Level 2 are provided in Table 2 and Table 2A, as applicable.

The requirements for Level 3 are in Table 3 and 6.4.2, as applicable.

As documented in the written practice, on-the-job training for the purpose of gaining experience shall be overseen by personnel certified in accordance with this document. For trainees gaining experience, documentation shall be available for review to indicate individual, date, description of activity within the method, hours, and certified personnel providing direct observation.

Additional experience requirements for current Level 3 radiography personnel transitioning to either film or non-film radiography are 240 hours with guidance or supervision from an examiner, instructor, or outside agency.

### 6.3.2 Previous Experience

A candidate's experience with a previous employer may be accepted by the current employer only if such experience is documented and approved by the Responsible Level 3 or Examiner.

All or a portion of previous hours may be accepted as applicable.

For documentation of previous experience, records other than original records may be accepted if adequacy and equivalency have been determined to be acceptable by the Responsible Level 3 or Examiner.



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### 6.3.3 Equivalent Experience

For personnel previously certified under NAS 410, EN 4179 or other recognized NDT qualification program, the adequacy and equivalency of their previous experience to the requirements of Table 2, Table 2A, or Table 3 shall be determined and documented by the Responsible Level 3 or Examiner.

**Table 2 – Minimum Experience Requirements for Level 1, Level 2-Limited and Level 2**

Experience time in hours				
	Level 1	Level 2 with previous Level 1 certification	Level 2 without previous Level 1 certification	Level 2-Limited
PT	130	270	400	200
MT	130	400	530	200
ET	200	600	800	200
UT	200	600	800	200
IRT	200	400	600	200
RT Film or Non-Film	200	600	800	N/A
RT Film & Non-Film	220	780	1000	N/A

**Table 2A – RT Experience Requirements for Transition to Film and Non-film**

Additional Minimum Experience Time in Hour		
Current level 1	Current Level 2	Current Level 1 to 2 Film and Non-Film
20	200	800

**Table 3 – Minimum Experience Requirements for Level 3 in Common Methods**

College or University	Level 2 Experience
None	4 years
Two years of engineering or science study at a technical school, college or university	2 years
3-4 year science or engineering undergraduate degree	1 year



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## 6.4 Emerging NDT Methods

### 6.4.1 Minimum hours

The minimum required training and experience hours for methods used by the employer that are not listed in [1.3](#), Table 1, and Table 2 shall be established by the Responsible Level 3.

### 6.4.2 Levels 1 and 2

When determining training or experience hours for new methods not listed in Tables 1 and 2, the minimum hours shall be based on the requirements for a method of similar complexity listed in Table 1 and 2. This only applies to “other” or emerging methods as defined in 1.3.1 and cannot be applied to penetrant, magnetic particle, ultrasonic, radiography thermography or eddy current testing.

### 6.4.3 Level 3

When approved by the cognizant engineering organization and authorized by the employer’s written practice, an employer may qualify and certify its first Level 3 in a new NDT method not listed in 1.3 provided:

- The candidate has the skill and ability to carry out the Level 3 responsibilities in 5.1.5.
- All of the requirements in Table 4 are met.

The requirements of 6.4.1, 6.4.2 and 6.4.3 only apply to “other” or emerging methods as defined in 1.3.1 and cannot be applied to penetrant, magnetic particle, ultrasonic, radiography, thermography, or eddy current testing.

**Table 4 – Minimum Requirements for First Level 3 in an Emerging NDT Method**

College or University	Instruction/ Study	Experience	Other NDT Certifications
No engineering or science study at a technical school, college or university	80 hours	300 hours	At least one previous Level 3 or two Level 2 certifications held
Two years of engineering or science study at a technical school, college or university	60 hours	200 hours	At least one previous Level 3 or two Level 2 certifications held
3-4 year science or engineering undergraduate degree	40 hours	200 hours	At least one previous Level 2 certifications held



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## 7. Examinations

### 7.1 Purpose

#### 7.1.1 General

Examinations to verify the technical qualifications of candidates shall consist of a general, specific and practical examination for each method in which the candidate is to be certified.

Requirements stated in Chapter 6 shall be completed before examination.

An examination for visual acuity shall also be conducted prior to the candidate's first certification and periodically thereafter.

The requirements for the vision examination, the questions or question database used for the general and specific examinations and the checklist for the practical examination shall be available for review by the employer's customers.

Examinations and test samples shall be made available to the candidates only during administration of the examinations.

Verbal translation of written examinations is not permitted.

#### 7.1.2 Vision Examination

The vision examination for trainee, Level 1-Limited, Level 1, Level 2-Limited, Level 2 and Level 3 personnel shall assure that the applicant's near vision and color perception meet the requirements of Table 5.

Vision requirements do not apply to instructors or auditors. Near vision tests shall be administered annually and color perception tests shall be administered at least every 5 years.

The employer shall ensure the flow-down of the Table 5 vision requirements to all necessary personnel and/or facilities. Vision tests shall be administered by trained personnel designated by the Responsible Level 3 or by qualified medical personnel.

When vision correction is necessary to pass the visual acuity exam, vision correction shall be worn during all testing/inspections. Any limitations in color perception shall be evaluated by the Responsible Level 3 prior to certification and must be approved in writing.

**Table 5 – Vision Requirements**

Examination Requirements	
Near vision options (select one)	<ul style="list-style-type: none"> <li>• Tumbling E in accordance with ISO 18490</li> <li>• 20/25 (Snellen) at 16" (40.64 cm) +/- 1" (2.54 cm)*</li> <li>• Jaeger No. 1 at not less than 12" (30.48 cm) *</li> </ul>
Color perception	Personnel shall be capable of adequately distinguishing and differentiating colors used in the process involve

\* In at least one eye, natural or corrected simulated vision test and distance is not permitted.



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## 7.1.3 General Examination

The general examination shall be a **closed book examination** covering the cross-section of the applicable method at the appropriate level.

A minimum of 40 questions shall be administered for the general examination at Levels 1, 2, 2-Limited or 3.

The Finnish Aerospace Non-Destructive Testing Board (FANDTB) will oversee all general examinations in the qualification and certification process of all personnel carrying out NDT work/inspections in the Aerospace Industries in Finland. The FANDTB will:

- Produce a question database (General examination questions)
- Produce examination papers.
- Appoint an examiner.
- Administration and grading of examination.

For Level 3, the basic examination questions shall address the general knowledge (Level 2) type questions on common methods.

A successful completion (passing) of the basic examination, before attending the method examination for which certification is sought, shall be considered satisfactory evidence that the other NDT methods have been satisfactorily covered.

A once-off Basic Examination for the first Level 3 Certification consists of the following questions:

- 20 questions regarding materials technology and manufacturing
- 60 questions on the common NDT methods
- Questions on this document, EN 4179 and EASA regulations

Possession of a current ASNT or NANTTB certificate at the appropriate level by the candidate may be satisfactory evidence that the general examination requirement is satisfied as defined in the employer's written practice.

## 7.1.4 Specific Examination

The specific examination shall be an **open book** examination covering the requirements and use of the specifications, codes, standards, equipment, operating procedures, product knowledge and test techniques the candidate may use in the performance of his/her duties with the employer.

A minimum of 30 questions shall be administered for the specific examination at Levels 1, 2-limited, 2 and 3.

Reference material, as determined by the Responsible Level 3 or Examiner, such as specifications, tables, formulas, etc. shall be provided.

Questions utilizing such material shall require understanding of the information contained therein rather than merely finding its location.





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## 7.1.5 Practical Examination

The practical examination shall consist of a demonstration of proficiency in performing tasks that are typical of those to be accomplished in the performance of the candidate's duties.

If the candidate is required to demonstrate proficiency in the application of the process as well as interpretation of results, hardware test samples shall be used. The candidate shall not be familiar with the test sample and the location of the discontinuities located therein.

If the candidate is only required to interpret the results and not perform the process of generating the image, the test samples may be images, such as radiographs or other resultant test data. A written checklist covering the topics detailed in the following sub-paragraphs shall be developed and completed by the Responsible Level 3 or Examiner to assure adequate coverage and to assist in the administration and grading of the examination.

In addition to using the checklist, the Responsible Level 3 or Examiner shall determine and document how the examination results obtained by the candidate are to be documented (e.g. part maps, drawings, sketches, written descriptions, etc.).

All such documentation shall become part of the examination and filed accordingly.

### 7.1.5.1 Level 1

The candidate shall demonstrate proficiency by using a work instruction to process at **least 2 test** samples of **differing configurations** for each method, with at least one test sample for each technique for which certification is sought.

When only one configuration of hardware is to be inspected upon certification, both test samples may be of the same configuration. The test samples shall meet the definition in 3.33 in EN 4179 and shall be representative of the products to be encountered by the candidate in the performance of his/her duties with the employer.

If approval to accept or reject hardware is to be granted by the Responsible Level 3, the candidate shall interpret and document the results of the inspection of the test samples. The checklist shall include proficiency in the use and standardization of equipment and materials, adherence to procedural details and, if applicable proficiency in the interpretation and evaluation of indications.

### 7.1.5.2 Level 2-Limited

Annex A defines requirements for Level 2-Limited.

### 7.1.5.3 Level 2

The candidate shall demonstrate proficiency by inspecting at **least 2 test** samples of **differing configurations** for each method, with at least one test sample for each technique for which certification is sought.

When only one configuration is to be inspected upon certification, both test samples may be of the same configuration. The test samples shall meet the definition in 3.33 in EN 4179 and shall be representative of the products to be encountered by the candidate in the performance of his/her duties with the employer. Candidate shall write technical NDT instruction as a part of Level 2 examination.



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In addition to the two minimum known and documented test samples with discontinuities, specimens without discontinuities may be included. The candidate shall document the NDT results in accordance with the applicable acceptance criteria.

The checklist shall include proficiency in the use and standardization of equipment and materials, adherence to procedural details, the accuracy and completeness of interpretation and evaluation of indications.

## 7.1.5.4 Level 3

The candidate shall demonstrate proficiency by preparing an NDT procedure appropriate to the employer's current requirements and aerospace NDT standards for the method.

The procedure or work instruction shall be developed in conjunction with the general and/or specific examination(s) required for certification or recertification, as applicable.

The results of the practical examination shall be documented, and a checklist shall be used to address the technical accuracy, technical content, and clarity of the procedures or written instructions prepared by the candidate.

When the candidate's duties will include processing and/or acceptance or rejection of products, proficiency in performing such tasks shall be demonstrated by a hands-on practical examination equivalent to Level 2 in accordance with 7.1.5.4.

## 7.2 Administration of Examinations

### 7.2.1 General

The administration and grading of all examinations shall be the responsibility of the Responsible Level 3 or Examiner. The Responsible Level 3 or Examiner may delegate in writing the administration and grading of examinations using multiple choice or true/false type questions to non-Examiner personnel.

All practical examinations shall be administered by the Responsible Level 3 or Examiner. Responses to essay and fill-in questions must be evaluated by the Responsible Level 3 or Examiner to verify the candidate's adequate understanding of the subject matter.

In no case can an examination be administered by oneself or by a subordinate.

### 7.2.2 Administration by an Outside Agency

When an outside agency is used to administer examinations, the employer shall ensure that all individuals involved in the administration of the examinations meet the requirements of this document. In all cases, the ultimate responsibility for compliance to this document shall remain with the employer.

### 7.2.3 Scoring

The candidate for certification must achieve a minimum score of 70 % on each individual examination.

In addition, the candidate must **detect all** discontinuities, flaws or conditions specified by the Level 3 during the practical examination and achieve a minimum score of 70%.

The candidate must have an **average score of no less than 80 %** in order to be eligible for certification. All examination scores shall be of equal weight in determining the average score.



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For example, if only specific and practical examinations are administered for recertification, only those scores shall be factored into the average score. If a general examination is also given for recertification, the general score shall also be factored into the average score.

For a Level 3 recertified using Annex B.1, the score for the hands-on practical, if administered, will be used as the average score. Score for ASNT NDT certificates scored as “pass/fail” and used in lieu of the general examination per 7.1.3 shall be assigned a value of 80%.

## 7.2.4 Re-Examination

Candidates failing any general, specific or practical examination shall receive additional training as determined and documented by the Responsible Level 3 or Examiner before attempting re-examination of the failed exam.

The additional training shall be documented and shall address those areas found deficient in the candidate's skills or knowledge. The re-examination shall not use the same written tests or test samples that were used in the failed examination.

The re-examination test must contain a **minimum of 25%** new questions. A current certification shall be suspended if an individual fails an examination for recertification.

## 8. Certification

### 8.1 General

Personnel who have demonstrated that they possess the appropriate qualifications are eligible for certification by their employer in accordance with the employer's written practice.

Certification is not required for trainees, instructors, NDT auditors, or personnel performing specialized inspections using direct readout instruments.

### 8.2 Records

#### 8.2.1 Minimum Requirements

The employer shall maintain personnel certification records as long as the certification is in effect. The records maintained by the employer shall include, as a minimum:

- a. Name of the certified individual.
- b. Level, method, and technique(s) 1 for which individual is certified.
- c. The latest written and practical examinations and the scores from the immediately previous exams.
- d. If Annex B is used, documentation of credit points used for Level 3 recertification. Last written and practical examinations need not be maintained.
- e. Date and expiration of current certification(s). 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.
- f. NDT training history that identifies the source, type of training, dates of training and course hours, and, if applicable, the documentation required by 6.1.3 and 6.1.4



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- g. NDT experience history, including any previous certifications, both with current and previous employers sufficient to justify satisfaction of experience requirements for qualification, and, if applicable, the documentation required by 6.3.2 and 6.3.3
- h. Results of the most recent (i.e. current) visual acuity and color perception examinations.
- i. Extent and documentation of formal education when used to meet qualification requirements.
- j. The name and signature of the employer's representative authorizing the certification.
- k. Results of most recent annual proficiency review.

## 8.3 Loss of Certification

### 8.3.1 Expiration

Certifications shall expire when the certification interval has lapsed with no recertification issued. Certification, annual proficiency review, and vision examinations are considered to expire at the end of the corresponding month in which the event began.

### 8.3.2 Suspension

Certification shall be suspended when:

- Vision examination is expired.
- Individual does not perform in the method certified for at least 12 consecutive months.
- Individual fails recertification examination.
- Individual's performance is found to be deficient in any manner.
- Annual proficiency review is expired.

### 8.3.3 Revocation

Certification shall be revoked when the individual does not perform in the certified method for the employer for at least 24 consecutive months, when employment has been terminated, or when the individual's conduct is found to be unethical or incompetent.

When an individual is re-hired by the same employer within 24 months, certification may be considered as suspended.

## 8.4 Reinstatement of Certification

Certifications that have been suspended may be reinstated up to the original certification date when the cause for the suspension has been corrected and the correction verified by the employer or the individual's proficiency is verified by the Responsible Level 3 or Examiner.

Certifications that have expired or been revoked may only be reinstated by specific and practical examination.



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Current NANDTB certificates may be utilized for new employment provided that the new employer administers specific and practical examinations that are representative of their processes and product per 7.1.4 and 7.1.5.

## 8.5 Recertification

### 8.5.1, Level 1, Level 2- Limited and Level 2

Level 2-Limited personnel shall be re-certified for each certification held at intervals not to exceed **two years**. Level 1 and 2 personnel certified to this standard shall be recertified at intervals not to exceed **five years**.

Recertification shall be accomplished by successful completion of practical and specific examinations.

### 8.5.2 Level 3

Level 3 personnel certified to this document shall be recertified at intervals not to exceed five years. Recertification shall be accomplished in accordance with Annex B or by successful completion of specific and practical examinations.

#### 8.5.2.1 Hands-On Practical Examination

If accepting products is required as a part of the Level 3's duties, an additional hands-on practical examination equivalent to Level 2 is required.

## 8.6 Annual Proficiency Review

The employer shall develop and implement a documented annual process to verify technical proficiency for each method during the certification cycle for all levels of personnel processing or inspecting products.



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## Annex A

### Qualification & Certification of Level 2-Limited

#### 1. Foreword/Reasoning /Remark

The Level 2 Limited qualification and certification can be utilized in cases, where NDT tasks within the method are not very complex. In some cases, the scope of work and amount of NDT tasks may be very limited (e.g 20 Ultrasonic wall thickness measurements per year, which will make the full Level 2 certification practically impossible.

Therefore Level 2 Limited qualification and certification may be used if the scope of work is limited and the amount of work makes it hard in accomplish OJT for method. The Level 2-Limited certification may be utilized in situation where inspection tasks are simple and well instructed. Inspection specific training for Level 2 Limited personnel is recommended.

#### 2. Application

- This Limited Level 2 Certification is not mandatory for employers.
- Except for Radiographic Testing, Level 2 Limited certification is permitted for all Common Methods and Other Methods defined in this document.
- Individuals are restricted to Level 2 Limited certification in one technique only per method. They may, however, hold a Level 2 Limited technique certification in multiple methods. In most cases, the employer will specify the simplest technique in the method, as the basis for Level 2 Limited certification(s).
- A qualified Level 2 Limited is limited only by technique boundaries and should be comparable in every way with a qualified full Level 2 operating within the same technique boundaries. In the technique for which they hold Level 2 Limited certification, individuals shall:
  - Have the skills and knowledge to set up and standardize equipment, process parts, interpret and evaluate for acceptance or rejection, and document results.
  - Be thoroughly familiar with the scope and limitations of the technique.
  - Have the skills and knowledge to conduct system performance checks in accordance with the applicable process standard.
  - Be capable of providing necessary guidance to trainees and Level 1 personnel.
  - Be familiar with the codes, standards, and other contractual documents that control the technique as used by the employer.
  - When specified in the written practice, be capable of developing work instructions from approved general procedures. Such work instructions shall require final approval by a Level 3 certified in the method.
  - Have a basic knowledge of relevant product manufacturing and inspection technology.
  - When specified in the written practice, have a basic knowledge of aircraft system maintenance.



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## 3. General Requirements:

- Examination shall be under the control of the FANDTB. Training, examination, certification and vision requirements shall comply with this document.
- The use of Level 2 Limited shall be agreed and documented by the Responsible Level 3 and approved by the cognizant engineering organisation.
- The Level 2 Limited qualification and certification requirements shall be detailed within the employer's written practice.
- Candidates for certification to Level 2 Limited shall be formally trained in accordance with the requirements of this document and satisfy the minimum formal training hours for Level 2.
- Candidates for certification to Level 2 Limited shall meet the following examination requirements:
  - General examination, as for Level 2.
  - Specific examination, as for Level 2 covering all techniques required by the employer (not just the technique sought for Level 2 Limited).
  - Practical examination, consisting of at least two test samples of differing configurations for the technique being sought.
- The minimum experience required for Level 2 Limited shall not be less than stated in Table 2.
- With due consideration for the technique's complexity, the required technique experience hours shall be defined by the Responsible Level 3 and documented within the employer's written practice.
- Level 2 Limited personnel shall be re-certified at intervals not to exceed two year.
- Recertification shall be accomplished by successful completion of practical and specific examinations equivalent to initial certification.



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## Annex B

### Credit System for Recertification of Level 3 NDT Personnel

#### A.1 Scope

This annex specifies the requirements for recertification of Level 3 NDT personnel using the credit system. It applies only to those persons holding a valid Level 3 NDT certification at the time of recertification.

#### A.2 Requirements

**A.2.1** Documentation for recertification shall be submitted to the Responsible Level 3 or NANDTB at least 14 days prior to the expiration date of the certification. Application for recertification of the Responsible Level 3 shall be made directly to the applicable regulatory agency, NANDTB, or employer for review by a designated Level 3.

**A.2.2** The candidate shall have been employed in a Level 3 function for a minimum of 36 months (at least 12 of which are in the last 24 months) within the previous five years in the method(s) for which recertification is sought. The number of months is cumulative and does not need to be consecutive months for validation purposes.

**A.2.3** Continuity in the method shall be demonstrated. The candidate shall provide a list of 8 verifiable Level 3 tasks in each NDT method for which recertification is sought during the 5 year period.

**A.2.4** Candidates shall provide objective evidence that they have kept up to date with current NDT technology in the method(s) for which they are seeking recertification by obtaining a minimum of 24 points during the five year period of certification, irrespective of the number of certifications (methods) obtained, by engaging in a combination of activities listed in Table A.1.

**A.2.5** The approval of Annex B activity documentation shall be determined and documented by the Responsible Level 3 or NANDTB as defined within the employer's written practice. Annex B recertification for the Responsible Level 3 shall be determined and documented by the employer. A single event shall only be used for one award credit activity during a five year period.

#### A.3 Definitions

##### A.3.1 Committee or Panel Meetings:

Meetings, conferences, symposia, seminars, trade association meetings, panels, etc. organized or sponsored by a regional, national or international NDT organization or technical society. Foreign or international meetings qualify if the sponsor(s) are national or international.





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### A.3.2 Committee Projects:

Specific identifiable official activities of regional or national technical societies, committees or work groups, such as round robins or individual studies, preparation of guidelines, appendices, specifications, recommended practices, procedures, codes or standards, etc. Documentation may include memos or reports, drafts of committee output documents, or official written comments submitted by the candidate on such documents.

### A.3.3 Task:

An activity for which level 3 re-certification is required e.g., approval of an NDT Technique Instruction or NDT procedure.

**Table A1 – Level 3 Awarded Credit Activity**

Activity	Criteria	Point Allocation	Maximum points per 5-year period
1. Authoring or co-authoring technical NDT papers, presentations, or white papers	Sole Author	8	8
	Co-Author	4	
2. Authoring or co-authoring for company or industry NDT specifications or standards	Each Standard/Specification	2	8
3. Attending NDT technical sessions, committee or panel meetings organized by:  a) National or international technical societies, associations and institutes b) Inter-company NDT teams comprised of members from several locations	1 day or 1 meeting	1	8
	2 days	2	
	3 or more days	4	
4. NDT instructor teaching academic courses, or courses designed to prepare students for NDT qualification	For each 8 hours of instruction.	4	8
5. Participating in technical courses or seminars	For every 8 hours of documented instruction	2	8
6. Participating in technical courses or seminars for which academic credit is given	For actual Continuing Education Units (CEUs) or academic credit earned	Actual CEUs/credit awarded	8
7. Obtaining an initial * Level 3 certificate from a recognized industry source (applicable only to initial professional certification.  * This does not apply to professional recertification	For each method obtained	4	4



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**Table A1 – Level 3 Awarded Credit Activity (Continued)**

Activity	Criteria	Point Allocation	Maximum points per 5 year period
8.Non-Destructive testing Examiner	For each qualification examination	1	6
9.NDT related technical and/or scientific publications published either internally or externally	For each published paper	4	8
10.Documented NDT contributions to company, technical society, or industry committee project	For each documented contribution	4	8
11. Documented participation in NDT-related studies, developments, or investigations.	For each documented contribution	4	8
12.Documented continuous satisfactory performance as a Level 3	Written testament for each method in the certification period	1	4
13.Attend NDT equipment or trade show	For each show attended	1	4
14.Conduct external NDT audits	For each external audit conducted	2	6
15.Development of new NDT processes, facilities, or systems	For each documented contribution	4	8
16.Submitting and/or obtaining a patent for an NDT product or process	Sole inventor	8	8
	Co-inventor	4	



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## Annex C Approved Outside Agencies

### 1. Agency Approval.

Agencies shall meet the requirements/criteria set out in this document or that of EN 4179/ NAS 410 and will be audited if needed by a representative of the FANDTB and approval will be through the FANDTB.

Approval can also be based on third party approval ***only if*** the approval is based on EN 4179/NAS 410, proof of this approval need to be made available to the FANDTB. A copy of this approval will be kept and made available for auditing purposes. NADCAP or other National NDT Board approval is considered as a satisfactory evidence of training school or examination body.

### 2. Approved Outside Agencies for examination and training bodies

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|--|--|
| 1. Taitotalo.<br>Kaarnatie 4,<br>00410 Helsinki  | 2. ASNT<br>1711 Arlingate Lane<br>Columbus OH, USA   |
| 3. Inspecta Sertifiointi Oy<br>PL 530 Robert Hubertintie 2,<br>01511 Vantaa  | 4. Lavender International NDT Consultancy Services Ltd.<br>Unit 7<br>Penistone Station, South Yorkshire<br>S36 6HP<br>Sheffield UK |
| 5. TEST NDT International Limited<br>Hazel End<br>Spooner Vale, Windermere<br>Cumbria<br>LA231AU<br>United Kingdom | 6. The South West School of NDT<br>Longwood Drive, Whitchurch,<br>Cardiff, CF14 7HY  |