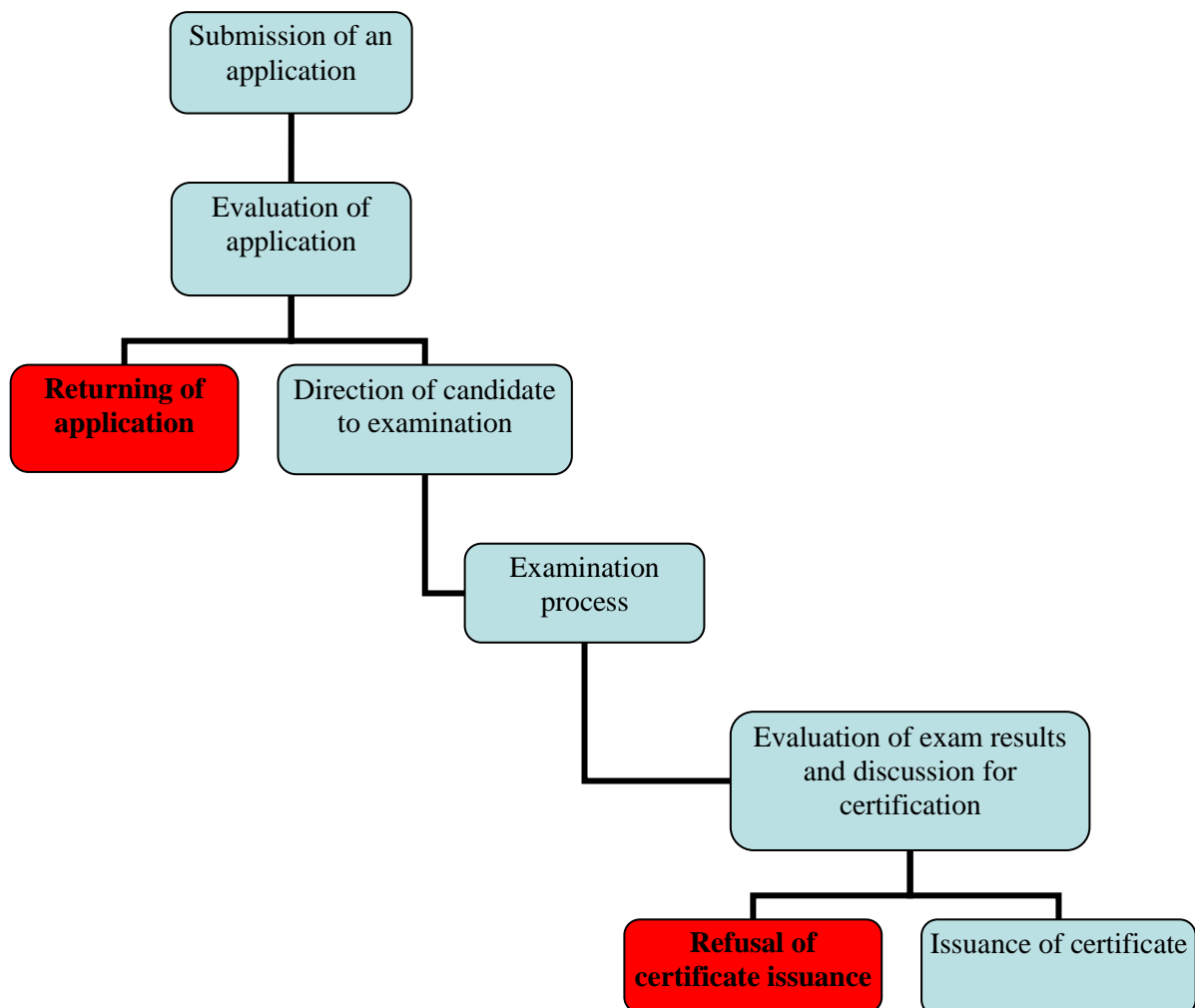

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Certification of personnel in the NOVA EXPERT PCB is carried out using the certification scheme, which contains the following procedures:

1. Submission of an application to NOVA EXPERT PCB for certification with the required documents attached;
2. Assessment of compliance of the application with the requirements of NOVA EXPERT PCB and decision-making on it;
3. The direction of the candidate to the exam (practical and theoretical);
4. Examination at an approved examination organization, notified by the NOVA EXPERT PCB;
5. Analysis of the exam results by the NOVA EXPERT PCB certification committee and issuance of a certificate of competency to the candidate;
6. Continuous monitoring of the certificate holder's compliance with the requirements for certification.



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The candidate on certification schemes level 1 and level 2 in methods ET, MT, PT, RT, UT, VT or in level 2 of Ultrasonic Advanced Methods UT-PA, UT-TOFD, shall comply with following regulations:

Table 1 - NDT Methods and abbreviated terms used in NOVA EXPERT PCB

NDT method	Abbreviated terms
Eddy current testing	ET
Magnetic testing	MT
Penetrant testing	PT
Radiographic testing	RT
Ultrasonic testing	UT
Visual testing	VT
Ultrasonic Testing - Phased Array	UT-PA
Ultrasonic Testing - Time of Flight Diffraction	UT-TOFD

The candidate shall fulfil the minimum requirements of vision and training prior to the qualification examination and shall fulfil the minimum requirements for industrial experience prior to certification according the following requirements:

1. The candidate shall provide documentary evidence of satisfactory vision in accordance with the following requirements:
 - a. near vision acuity shall permit reading a minimum of Jaeger number 1 or Times Roman N 4.5 or equivalent letters (having a height of 1,6 mm) at distance not less than 30 cm with one or both eyes, either corrected or uncorrected;
 - b. color vision shall be sufficient that the candidate can distinguish and differentiate contrast between the colors or shades of grey used in the NDT method concerned;
 - c. Further, after certification, on an annual basis, a sharpness check should be carried out.
 - d. The certification body may consider replacing the requirements in a) by compliance with an appropriate alternative.
 - e. Subsequent to certification, the tests of near visual acuity shall be carried out annually and verified.

2. Theoretical training

The candidate for level 1 and level 2 certification shall provide documentary evidence acceptable to the NOVA EXPERT PCB, that he has satisfactorily completed training in the method and level for which the certification is sought.

For all levels, the candidate shall satisfactorily complete a course of theoretical and practical training in NOVA EXPERT PCB approved training organization.


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Table 2 - Minimum Training Requirements

NDT method	Amount hr., Level 1	Amount hr., Level 2 (Total amount hr., including LEVEL1)
ET	40	64
MT	16	24
PT	16	24
*RT	40	80
UT	40	80
VT	16	24
**UT-PA	-	104
**UT-ToFD	-	80

NOTE* For RT, training hours do not include radiation safety training.


NOTE** For UT-PA or UT-TOFD, valid UT level 2 certificate is mandatory.

Part of training are based on candidates with basic mathematical skills and prior knowledge of materials and processes. In the absence of the above listed skills and knowledge, the NOVA EXPERT will ask the candidate to undergo additional training. Hours of study include both practical and theoretical courses.

- Duration of training may be **reduced up to 50%** for candidates seeking certification in more than one method, or for those already certified and seeking certification in another method (e.g. MT, PT), or for those already certified and seeking certification in another method, when the training syllabus concerned duplicates certain aspects (e.g. product technology), the total number of training hours for these methods (e.g. PT, MT, VT) may be reduced in line with the training syllabus;
- For candidates who have graduated in a relevant subject from technical college or university or have completed at least **two years** of relevant engineering or science study at college or university (relevant to the NDT method e.g. chemistry, mathematics or physics or product industry metallurgy), the total required number of training hours may be **reduced by up to 50 %**.
- When the certification sought is limited in application (e.g. automated ET, UT of bar, tube, and rod or normal beam ultrasonic thickness and lamination testing of rolled steel plate) and in technique (e.g. RT using only radiography), the training duration may be reduced by up to 50 %.
- For direct access to Level 2 RT when certification is restricted to the film interpretation and to only one product sector, a minimum training requirement of **56 h** applies.

3. Industrial NDT experience

The minimum duration of experience to be gained in the sector where the candidate is seeking certification shall be as given in Table 3, with the possible reductions. When the candidate is seeking certification in more than one method, the total time of experience shall be the sum of the experience in each method.

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For Level 2 certification, the intent of this Schema is that work experience consists of time as a Level 1. If the individual is being qualified directly to Level 2, with no time at Level 1, the experience shall consist of the sum of the times required for Level 1 and Level 2. No reduction in the period of experience shall be allowed.


In the event that a part of the experience is sought following successful examination, the results of the examination shall remain valid for five years or for the total experience time required for the methods concerned, whichever is the greater.

Industrial experience in NDT can be obtained either before or after passing a qualifying exam. Documentation of experience data is confirmed by the employer and submitted to the NOVA EXPERT PCB by authorized examination organization. In case if after a successful pass of exam, the experience is required, then the results of examination should remain valid for up to five years.

Table 3 - Minimum industrial experience

NDT method	Work experience in month (cumulative amount)	
	Level 1	Level 2
ET, RT, UT	3	12
MT, PT, VT	1	4
UT-PA & UT-TOFD	-	12

- a) Work experience is based on a nominal **40 h/week** or the legal week of work. When an individual works in excess of **40 h/week**, he may be credited with experience based on the total hours, but he shall be required to produce evidence of this experience.
- b) Credit for work experience may be gained simultaneously in two or more of the NDT methods covered by this procedure, with the decrease in the overall required experience as follows:
 - two testing methods: reduction of total required time by **25 %**;
 - three testing methods: reduction of total required time by **33 %**;
 - four or more testing methods: reduction of total required time by **50 %**.
- c) In all cases, the candidate is required to have at least half of the required experience for each NDT method and sector combinations for which certification is requested, and it will never be less than one month in duration.
- d) The duration of the experience may be reduced by up to **50%**, but shall not be less than one month, when the required certification is limited in use, for example, thickness measurement or automated testing.
- e) Up to **50%** of the practical experience time may be achieved by an appropriate practical course, the duration of which may be weighted by a maximum factor of **five (5)**. The course focuses on practical solutions of frequently occurring testing problems and will include an important element of testing of known defective samples. The course program is to be approved by the NOVA EXPERT PCB.
- f) For certification of **Level 2**, the purpose of this Scheme is that industrial experience is gained as **Level 1**.

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- g) The quality of the acquired work experience may be variable, and skills may be assimilated faster in an environment where work experience is focused and has a high degree of relevance to the certification sought;
- h) When gaining experience simultaneously in two or more surface NDT methods, i.e. MT, PT and VT, the experience gained in the application of one NDT method may be complementary to the experience gained in one or more other surface methods;
- i) Experience in one sector of an NDT method for which certification is already held may be complementary to the experience in a different sector of the same NDT method;
- j) The level and quality of education possessed by the candidate should also be considered. This is particularly the case for the Level 3 candidate, but it can also be applicable for other levels. Graduating from a technical college or university or going for at least two years of study engineering science in a college or university, can be a justification for reducing of work experience.

4. Qualification examination

The qualification examination for one NDT method, as applied in one industrial sector or to one or more product sectors. NOVA EXPERT PCB determines and publishes the maximum amount of time allowed for candidates to complete each exam, which is based on the number and difficulty of the questions. The average time on multiple choice questions does not exceeds **three (3) minutes** for an answer on question. The average time given to questions requiring answers in the form of an essay or story (description) should not exceed **ten (10) minutes**.

The general exam includes only questions selected on a random basis from a given set of general exam questions valid at the date of examination from the NOVA EXPERT PCB or approved Examination organization. The candidate shall be required, as a minimum, to give answers to the number of multiple-choice questions shown in Table 4.

Table 4 — Required minimum number of questions — General examinations of Level-1 and Level-2.

NDT method	Number of questions
ET, RT, UT (UT-PA & UT-ToFD)	40
MT, PT, VT	30

4.1. The content of Specific examination for LEVEL-1 and Level-2 qualification


The exam includes only questions selected in a random basis from a given set of general exam questions relevant to the relevant sector (s) of the NOVA EXPERT PCB approved Examination organization.

The exam includes **20 multiple** choice questions on calculations, NDT procedures and questions on codes, standards and Specifications norms.

In case if examination includes two or more sectors, then exam includes **30 multiple** choice questions, evenly spread between the industrial or product sectors concerned.


4.1.1 The content of examination. Practical exam for Level 1 and Level 2 qualification.

4.1.2 The practical examination shall involve applying of NDT method to prescribed samples, recording and, for Level 2 candidates, interpreting the resulting information to the degree

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required, and reporting the results in the required format. Specimens used for training purposes shall not be used for examination.

- 4.1.3 NOVA EXPERT PCB ensures that each sample is uniquely identified and has a master report in a prescribed form which includes all the equipment settings used to detect specified discontinuities contained within the sample, which are uniquely identified by an appropriate permanent marking to ensure that it is completely traceable. This marking is not interfering with the practical testing or inspection of the sample is concealed from the candidate while the sample is used for examination.
- 4.1.4 NOVA EXPERT PCB ensures that each master report compiled and approved by a Level 3 certificate holder for use in grading examinations. The independent test reports from which the master report is compiled shall be retained as records. NOVA EXPERT PCB ensures that samples are sector determined, simulating field geometries and contain discontinuities representing of those likely to occur during production or in servicing.
- 4.1.5 Samples used for calibration or for measurement tasks (e.g. thickness or coating measurement) do not need to contain discontinuities. For RT method, the samples do not need to contain discontinuities since these are exhibited in the radiographs for interpretation. For additional information on samples, see Table 5.
- 4.1.6 NOVA EXPERT PCB ensures that the number or amount of areas volume used for tests corresponds to the appropriate level, method of the NDT and the sector under consideration. Discontinuities are maintained on the used areas and volumes. Refer on Table 5 for the number of areas or volumes intended for level 1 and level 2 practical exams.
- 4.1.7 The NOVA EXPERT PCB ensures that the number of areas or volumes to be tested is adequate to the level, NDT method and sector concerned, and that those areas or volumes contains discontinuities. The requirements for the number of specimens and number of areas or volumes to be tested in the Level 1 and Level 2 practical examinations are given in Table 6.
- 4.1.8 The Level 1 candidate shall follow the NDT instruction(s) developed by the examiner for examinations.
- 4.1.9 The Level 2 candidate shall select the applicable NDT technique and determine the operating conditions related to a given code, standard or technical specification.
- 4.1.10 The Level 1 candidate shall demonstrate the ability to set up and calibrate the equipment, verify its sensitivity and record the test data. The Level 2 candidate shall also demonstrate the ability to interpret and evaluate previously recorded test data.
- 4.1.11 The time given for the examination depends on the number of samples and their complexity. The maximum time that is given for each area or volume tested is:
- a) for Level 1: 2 h;
 - b) for Level 2: 3 h.
- 4.1.12 Level 2 candidates shall draft at least one NDT Instruction suitable for Level 1 personnel, for a specimen selected by the examiner. The maximum time allowed for this part of the examination is 2 h.

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4.2. Grading of the Level 1 and Level 2 qualification examination


4.2.1. The examiner is fully responsible for the assessment of exams. General, specific, and practical examinations are evaluated separately.

4.2.2. To be eligible for certification, the candidate shall obtain a minimum grade of 70 % in each part of the examination (general, specific, and practical).


4.2.3. To pass the practical examination, a minimum grade of **70 %** shall be obtained for each sample tested, and for the NDT instruction, as applicable. Refer to Table 5 for guidance on the percentage of practical exam.

Table 5 — Subjects and weighting factors for grading — Practical examination/(D1 EN ISO 9712)

Item	Subject	Weight factor	
		Level 1 (%)	Level 2 (%)
1.	Part 1 — Knowledge of the NDT apparatus (including the function and verification of the setting of the apparatus).		
	a) system control and functional checks;	10	5
	b) verification of settings.	10	5
	Total:	20	10
2.	Part 2 — Application of the NDT method to the specimen. This consists of the following parts:		
	– for Level 2, selection of the techniques and determination of the operating conditions. Preparation of the specimen (e.g. surface condition), including visual examination;	5	2
	– the preparation (sur face condition) and visual examination of the specimen. For Level 2, the selection of the NDT technique and determination of operating conditions;	n/a	7
	– the setting up of the NDT apparatus;	15	5
	– the performance of the test.	10	5
	– the operations after the test. Post test procedures (e.g. demagnetization, cleaning, preservation).	5	1
Total:	35	20	
3.	Part 3 — Detection of discontinuities and reporting. The detection and reporting of the discontinuities and, for Level 2, their characterization (position, orientation, dimensions and type) and evaluation.		
	– detection of mandatory reportable discontinuities;	20	15
	– characterization (type, position, orientation, apparent dimensions, etc.);	15	15
	– Level 2 evaluation against code, standard, specification or procedure criteria;	n/a	15
	– production of the test report.	10	10

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Item	Subject	Weight factor	
		Level 1 (%)	Level 2 (%)
	Total:	45	55
4.	Part 4 — NDT instruction writing (Level 2 candidates), For Level 2, drafting the written instruction for Level 1.		
	- foreword (scope, reference documents);	-	1
	- personnel;	-	1
	- apparatus to be used, including settings;	-	3
	- product (description or drawing, including area of interest and purpose of the test);	-	2
	- test conditions, including preparation for testing;	-	2
	- detailed instructions for application of the test;	-	3
	- recording and classifying the results of test;	-	2
	- reporting the results.	-	1
	Total:	-	15
Overall grade for practical examination		100%	100%
To be successful, the candidate should achieve not less than 70 % in the NDT instruction writing part, i.e. 10,5 marks out of the 15,0 marks allowed.			
<p>A - The candidate failing to report a discontinuity specified on the specimen master report as “mandatory for candidates to report” when performing the test under the conditions specified in the master report shall be awarded zero marks for part 3 of the practical examination relating to the specimen tested. For RT, this condition applies to radiographic interpretation, i.e. failing one “mandatory to report” discontinuity on one radiograph leads to zero marks for the set of radiographs in part 3.</p> <p>B - The Level 2 candidate is required to produce an NDT instruction, suitable for Level 1 personnel, for a specimen selected by the examiner. When the Level 2 candidate is testing a specimen for which no NDT instruction is required, the grade is calculated as a percentage of the 85 remaining marks.</p>			

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4.3 Minimum number and type of specimens for the Level 1 and Level 2 practical examination

Table 6 — Minimum number and type of specimens for the practical examination of Levels 1 and 2

Product sectors	Method and level													
	UT1	UT2	RT1	RT2	ET1	ET2	MT1	MT2	PT1	PT2	VT1	VT2	UT-PA2	UT-ToFD2
Castings	2	2	2	2 + 12 rs	2	2	2	2	2	2	2	2	2	2
Forgings	2	2	2	2 + 12 rs	2	2	2	2	2	2	2	2	2	2
Welds	2	2	2	2 + 12 rs	2	2	2	2	2	2	2	2	2	2
Tubes and pipes	2	2	2	2 + 12 rs	2	2	2	2	2	2	2	2	2	2
Wrought products	2	2	2	2 + 12 rs	2	2	2	2	2	2	2	2	2	2
Industrial Sectors (combining two or more product sectors)	UT1	UT2	RT1	RT2	ET1	ET2	MT1	MT2	PT1	PT2	VT1	VT2	UT-PA2	UT-ToFD2
Metal manufacturing	2	2	2	2 + 12 rs	2	2	2	2	2	2	2	2	2	2
Pre-and in-service testing	3 c/f w	3 c/f w	2 c/ w	2 c/ w + 24 rs	3 t w	3 t w	3 c/f w	3 c/f w	3 c/f w	3 c/f w	3 c/f w	3 c/f w	3 c/f w	3 c/f w
Railway maintenance	2	2	-	-	2	2	2	2	2	2	2	2	2	2
Aerospace	3	3	2	2 + 12 rs	3	3	2	2	2	2	2	2	3	3

Where the practical examination requires the testing of more than one specimen, the second or any subsequent specimens shall be different in character, e.g. in product form, material specification, shape, size, and discontinuity type, from those tested previously.

Where, after the number of specimens required, product sectors are indicated by appropriate letters, this means that specimens from these sectors shall be included in the practical examination.

For radiographic examination, Level 1 and Level 2 candidates shall radiograph at least two volumes — except for Level 2 candidates having passed a Level 1 qualification examination, where at least one volume is to be radiographed.

Where a sector examination involves the testing of more than one product type, then the specimens tested shall be representative of all products or shall be selected at random by the examiner from the product range or materials which make up the sector.

A set of radiographs (12 or 24) shall be considered as one specimen.

Key: c ≡ casting; f ≡ forging; w ≡ weld; t ≡ tube; c/f ≡ casting or forging; rs ≡ radiographs; ds ≡ datasets


4.4 Conduct of examinations

All examinations are conducted in NOVA EXPERT PCB approved examination centers, which compliance with this certification scheme has been continuously monitored by NOVA EXPERT PCB. The list of approved examination centers can be found on NOVA EXPERT PCB webpage.

Upon arriving in examination center, candidate shall have on hands his possession valid proof of identification and an official notification of the successfully passed training program in the Approved Training Organization, which shall be shown to the examiner or invigilator upon request.

Any candidate who, during the course of the examination, will not abide by the examination rules or who perpetrates, or is an accessory to, fraudulent conduct will be excluded from all further qualification examinations for a period of **at least one year**.

Examination questions are validated by the NOVA EXPERT PCB Commission of Certification Scheme:

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- When offline e-assessment examination used for theoretical exam, system generated randomly selected questions are distributed by examiner to candidate, and after completion answers uploaded to the system be examiner for system automatic grading.
- When online E-assessment systems that are validate and approved by NOVA EXPERT PCB, selects randomly selected questions which are presented to a candidate on a computer and the grading is done by system automatically based on para 4.2 requirements.

For a practical examination candidate may use his own equipment when it is coordinated and approved with examination centers. Examiner shall evaluate practical exam result according to para 4.2 and Table 5 of this procedure and upload evaluation results to the system.

5. Re-examination

5.1. A candidate failing for reasons of unethical behavior is excluded from all further qualification examinations for a period of at least one year and shall wait at least **12 months** before reapplying on examination.

5.2. A candidate who fails to obtain a satisfactory grade required for certification may be re-examined twice in any of the failed part(s), provided that the re-examination will take place not sooner than **30 days** after the previous exam and no later than five years after the initial exam.

NOVA EXPERT PCB has full freedom of action regarding the resolution of an earlier re-examination if additional/ further training acceptable to the NOVA EXPERT PCB is satisfactorily completed.

Note: Examination portions in this context refers to:

- Level 1 and 2, General, specific, and practical examinations.

5.3 A candidate who failed to pass the second re-exam may apply and pass the exam in accordance with this procedure established for new candidates.


5.4 Examination exemptions are applied for individual changing sectors or adding another sector for the same NDT method. Such candidates shall take only the new sector specific and practical examinations for that method.

6. Validity of certificate

6.1. The maximum period of validity of the certificate is five years from the date when certificate was issued and all of the requirements for certification (training, experience, satisfactory vision test, success in examination) are fulfilled.

6.2. Certification becomes invalid:

- a) at the discretion of the NOVA EXPERT, e.g. after reviewing evidence of behavior incompatible with the certification procedures or failure to abide by a code of ethics;
- b) if the individual becomes physically incapable of performing his duties based upon failure of the visual acuity examination taken annually under responsibility of his employer
- c) if a significant interruption (e.g. absence or change of activity) takes place in the method for which the individual is certified;

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- d) if the individual fails recertification, until the individual meets the requirements for recertification or initial certification.

6.3 Renewal

Prior to the completion of the first period of validity and every 10 years thereafter, certification may be renewed by the NOVA EXPERT PCB for a new period of five years on production of:

- documentary evidence of a satisfactory visual acuity examination taken within the preceding 12 months;
- verifiable documentary evidence of continued satisfactory work activity without significant interruption in the method and sector for which certificate renewal is sought.

If the criterion b) for renewal is not met, the individual shall follow the same rules as for recertification (see para 7).

It is the responsibility of the certificate holder to initiate the procedure required for renewal. The renewal files shall be presented within six months before the date of expiration of the certification. As an exception, and based upon decision of the certification body, files presented within 12 months after the date of expiration may be considered. Over this period, no exception is admitted and the candidate shall be permitted to attempt a recertification examination.

7. Recertification

7.1. General provisions

Prior to the completion of each second period of validity (every 10 years), the certified individual may be recertified by the NOVA EXPERT PCB for a new period of five years or less, provided the individual meets the criterion for renewal specified in 6.3 a) and meets the applicable conditions described in the following.

It is the responsibility of certificate holders to initiate the procedures required to obtain recertification. If the recertification is applied for more than 12 months after expiry of the period of validity, a complete examination (general, specific, and practical) for Level 1 and Level 2 and a main method examination for Level 3 shall again be passed successfully.


7.2. Level 1 and 2

The candidate shall successfully complete a practical examination which demonstrates continued competence to carry out work within the scope defined on the certificate.

- The testing samples appropriate to the scope of certification shall be revalidated (see 11.2.2 EN ISO 9712) and in addition, for Level 2, the production of a written instruction suitable for the use of Level 1 personnel. If the candidate fails to achieve a grade of at least **70 %** for each sample tested, and, for Level 2, for the instruction, **two retests** of the whole recertification examination are allowed after at least **7 days** and **within six months** of the first attempt at the recertification examination.

- In the event of failure in the two allowable retests, the certificate shall not be revalidated and, to regain certification for that level, sector and method, the candidate shall apply for new certification. In this case, no examination exemptions shall be awarded by any other valid certification held.

8. The introduction of new methods or sectors of non-destructive testing/ Transition period

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8.1. For a new certification system, or when a new NDT method or new sector is applied to an existing certification system, NOVA EXPERT PCB temporarily assigns appropriately qualified personnel, such as examiners, for a period not exceeding five years, in order to conduct, monitor and evaluate qualifying exams.

8.2. Duly qualified personnel shall:

- a) have the knowledge of the principles of NDT and the specific knowledge in relation to the sector;
- b) have industrial experience of the application of the NDT method;
- c) have the ability to conduct qualification examinations;
- d) be able to interpret the questionnaire and results of qualification examinations.

9. Sectors

A.1 General provisions

When creating a sector, the NOVA EXPERT PCB uses the following lists of sectors in A.2 and A.3. This does not preclude the development of additional sectors to satisfy national needs.

A.2

These include

- a) castings (**c**) (ferrous and nonferrous materials);
- b) forgings (**f**) (all types of forgings: ferrous and non-ferrous materials);
- c) welds (**w**) (all types of welds, including soldering, for ferrous and non-ferrous materials);
- d) tubes and pipes (**t**) (seamless, welded, ferrous and non-ferrous materials, including flat products for the manufacturing of welded pipes);
- e) wrought products (**wp**) except forgings (e.g. plates, bar, rods);
- f) composite materials (**p**).

A.3 Industrial sectors


Sectors combining several product sectors including all or some products or defined materials (e.g. ferrous and non-ferrous metals or non-metals like ceramics, plastics, and composites):

- 1 - manufacturing;
- 2 - pre- and in-service testing which includes manufacturing;
- 3 - railway maintenance;
- 4 - aerospace.

Certification in the industrial sector may be available for all levels of qualification in all methods of non-destructive testing or may be limited to specific methods or levels of qualification. The scope of certification should be defined in the certificate.

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No.	Document/Records title	Placement	Responsible	Storage period
1.	Database of all certified individuals	NOVA EXPERT Server	Managing Director	Maintained updated
2.	Individual file(s)	NOVA EXPERT Server	Managing Director	10 years after certification expiring period
		Hard copies in certification center	Examination center, authorized signatory person	

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Note: All hard copies of Individual file(s) according this procedure are stored within Examination center according the mutual agreement with NOVA EXPERT PCB, and in case of necessity (e.g internal or external audit), files shall be issued to NOVA EXPERT PCB for evaluation.