



International Certification in NDT (ICN)

SCHEME FOR QUALIFICATION AND CERTIFICATION OF NON-DESTRUCTIVE TESTING PERSONNEL AS PER ISO 9712:2012

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FOREWORD

This certification standard is prepared by National Certification Board of ISNT, meeting the requirements of ISO 9712:2012

The effectiveness of any application of Non-Destructive Testing (NDT) depends upon the capabilities of the persons who perform and are responsible for the test. This standard has been developed to provide a means for evaluating and documenting the competence of the personnel whose duties require adequate theoretical and practical knowledge and skill of the NDT tests they perform witness, monitor or evaluate.

Most of the fabrication and inspection codes insist on only qualified and certified personnel to be employed to carry out mandatory NDT inspection jobs at various levels. Therefore it is the responsibility of the manufacturer and /or the employer to ensure the competency of the NDT personnel employed by him/her by proper training, qualification & certification.

This standard has been developed considering the current international practices and industrial scenario and accordingly aligned with International Standard (ISO 9712:2012).

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1.0 SCOPE

- 1.1 This scheme establishes a system for the qualification and certification of personnel to perform industrial nondestructive testing using any of the following methods:

NDT Methods	Abbreviations
Magnetic Particle testing	MT
Penetrant testing	PT
Radiographic testing ¹	RT ¹
Ultrasonic testing	UT
Visual testing	VT

¹This certification scheme in radiography is independent of Atomic Energy Regulatory Board (AERB) certification and does not cover licensing to handle & operate radiation sources.

2.0 REFERENCES

- 2.1 **ISO 9712:2012** 'Non-destructive testing, qualification and certification of NDT personnel' issued by the International Organization for Standardization
- 2.2 **IAEA-TECDOC-628** (2013), Training guidelines in non-destructive testing techniques, published by the International Atomic Energy Agency (IAEA), Vienna, Austria
- 2.3 **ISO 17024:2012** - General requirements for Bodies operating Certification of Persons
- 2.4 **ISO TR 25107: 2006** -Non Destructive Testing - Guidelines for NDT Training Syllabuses
- 2.5 **IS 13805:2004**-General Standard for Qualification and Certification of Non-Destructive Testing Personnel
- 2.6 Quality Manual NCB-ISNT/QMSD/01 Revision 1

3.0 TERMINOLOGY

- 3.1 **Authorization:** A written permission to perform specific tasks issued by the employer based on the individual's suitability for a specific job. In addition to the scope of certification, amongst others, the job specific knowledge, skill and physical ability could be assessed by job specific training. Examination may be required by the employer.
- 3.2 **Basic Examination:** This is applicable for level 3 only. It includes written examination, covering basic knowledge of other NDT methods as required for level 2, various materials, manufacturing processes and service conditions, discontinuities, their characteristics and causes, destructive testing, metallurgy, materials testing, metrology, quality assurance, safety in NDT etc. and understanding of this standard.
- 3.3 **Basic Education:** Minimum formal academic education required for qualification. It may be used to determine duration and level of training and experience required to be eligible for certification in NDT.
- 3.4 **Candidate:** The individual seeking certification in accordance with this scheme, and has met the required eligibility criteria like basic education, training, experience etc. as detailed in this scheme.

- 3.5 **Certification:** The procedures used by NCB-ISNT leading to a written testimony of the qualification of an individual's level of competence in specific sector(s), method(s) and level(s) to perform the tasks associated with a given NDT method.
- 3.6 **Certificate:** Written testimony of qualification issued by NCB-ISNT as per the provisions of this standard.
- 3.7 **Responsible Agency:** The organization for which the candidate works on a regular basis. Candidate may be self-employed.
- 3.8 **Experience:** Experience acceptable to NCB-ISNT, as detailed in this scheme gained under qualified supervision, in the application of the NDT method in the sector concerned, needed to acquire the skill and knowledge to fulfill the provisions of qualification. It does not include practical performed during training courses.
- 3.9 **Examination Centre:** Centre approved by NCB-ISNT, where certification examination(s) can be conducted.
- 3.10 **Examiner:** A person qualified to Level 3 in NDT method and specific sector(s) he/she is required to examine and authorized by NCB-ISNT to conduct and grade NDT **certification** examinations in that method and sector.
- 3.11 **General Examination:** Written examination, at Level 1 or 2, concerned with the principles of NDT method.
- 3.12 **ISNT:** Indian Society for Non-Destructive Testing, A society of professionals to promote NDT Science and Technology.
- 3.13 **Job Specific Training:** Training provided by the Responsible Agency to the certificate holder in aspects of NDT specific to employer's products, NDT equipments, NDT procedures and applicable codes, standards, specifications & procedures.
- 3.14 **Multiple choice examination question:** Wording of a question giving rise to four (or five) potential replies, only one of which is correct, the remaining three (or four).
- 3.15 **National Certification Board (NCB-ISNT):** The body that owns this scheme and administers procedures for certification of NDT personnel according to the requirements of this scheme.
- 3.16 **NDT Training:** A process of instruction in theory and practicals in the NDT method in which the certification is sought,. The training course syllabus and schedule shall meet the requirements of this scheme.
- 3.17 **NDT Method:** The discipline associated with applying a physical principle in non-destructive testing (for example, ultrasonic testing).
- 3.18 **NDT Technique:** A specific way of utilizing the NDT method (for example, immersion ultrasonic technique).
- 3.19 **NDT Procedure** - An orderly sequence of steps which describes all essential parameters and precautions to be applied in detailed terms where, how and in which sequence an NDT method should be applied to a product according to codes, standards and specifications. It may include acceptance standards.

- 3.20 **NDT Instruction:** A written description detailing the precise steps to be followed in testing as per established NDT procedure, standard, code or specification.
- 3.21 **Practical examination:** Assessment of practical skills, in which the candidate demonstrates familiarity with, and the ability to perform the test.
- 3.22 **Proctor:** An individual authorized by NCB-ISNT to supervise or invigilate the certification examination(s)
- 3.23 **Qualification Examination:** An examination administered by NCB-ISNT, to assess the General, Specific & Practical knowledge of the candidate.
- 3.24 **Qualification:** A demonstration of physical attributes, knowledge, skill, training and experience required to properly perform NDT tasks.
- 3.25 **Qualified supervision:** Supervision of a candidate gaining experience by NDT personnel certified in the same method under supervision or by non-certified personnel who, in the opinion of the NCB-ISNT, possess the knowledge, skill, training, and experience required to properly perform such supervision.
- 3.26 **Renewal:** Procedure for revalidation of a certificate without examination at any time up to five years after initial certification, supplementary or recertification examination.
- 3.27 **Recertification:** Procedure for revalidation of a certificate by examination or otherwise as specified in this standard.
- 3.28 **Sector:** Particular section of industry or technology where specialized NDE practices are used, requiring specific product related knowledge, skill, equipment or training. A sector can be interpreted to mean a product or an industry.
- 3.29 **Specification:** Document stating requirements of carrying out NDT.
- 3.30 **Specific Examination:** It is a written examination at Level 1 or Level 2, concerned with testing techniques applied in a particular sectors(s), including knowledge of the product(s) tested and of codes, standards, specifications, procedures & acceptance criteria.
- 3.31 **Specimen master report:** Model answer, indicating the acceptable result for a practical examination generated under defined set of conditions (equipment type, settings, technique, specimen etc.) against which the candidate's test report is graded
- 3.32 **Significant Interruption:** Absence or a change in the activity, which prevents the certified individual from practicing the duties corresponding to the level in the method and the industrial sector(s) for which (s)he is certified, for a continuous period exceeding one year.
- 3.33 **Supervision:** Act of directing the application of NDT performed by other NDT personnel, which includes the control of actions involved in the preparation of the test, performance of the test and reporting of the results.
- 3.34 **Test Specimen:** Specimen representative of product(s) in applicable sector(s) used in practical examinations.
Note: A specimen may include more than one area or volume to be tested. The test specimen may contain artificial or natural discontinuities, which are required to be detected and analyzed by the candidate during practical examination.
- 3.35 **Validation:** Act of demonstrating that a verified procedure works in practice and fulfils its intended function, normally achieved by actual witnessing, demonstration, field or laboratory tests or selected trials.

4.0 LEVELS OF QUALIFICATIONS

4.1 Classification

An individual certified in accordance with this standard shall be classified in one of the three levels depending upon his/her level of competence.

4.2 ICN Level 1

An individual certified to ICN Level 1 is qualified to carry out NDT tasks/assignments within the scope of certification according to written instructions. ICN Level 1 shall be able to:

- a. set up the equipment,
- b. carry out the tests,
- c. record the results obtained,
- d. classify the results in terms of written criteria; and
- e. report the results.

ICN Level 1 shall receive the necessary written instructions and/or supervision from Level 2 or Level 3 Personnel.

ICN Level 1 shall not be responsible for the choice of the test method or technique to be used nor for the interpretation of test results.

4.3 ICN Level 2

An individual certified to ICN Level 2 is qualified to perform non-destructive testing according to NDT procedures within the scope of the competence defined on the certificate. (S)He shall also be familiar with the scope and limitations of the method for which (s)he is qualified.

ICN Level 2 personnel shall be able to:

- a. choose the techniques for the NDT method to be used
- b. define the limitation of application of the testing method
- c. understand NDT related requirements of codes, standards, specifications & procedures applicable to the work, & prepare written instructions for Level 1
- d. set up, calibrate and verify equipment,
- e. perform & supervise the tests
- f. interpret and evaluate results according to applicable codes, standards procedures and specification,
- g. carry out & supervise all tasks at or below ICN Level 2
- h. provide guidance to personnel at or below ICN Level 2
- i. organize and report the results of non-destructive tests

4.4 ICN Level 3

An individual certified to ICN Level 3 is qualified to perform and supervise all NDT operations for which (s)he is certified and shall be competent for the following:

- a. ability to interpret and evaluate results in terms of existing codes, standards and specifications,
- b. sufficient practical background in applicable materials, fabrication and product technology to select methods and establish techniques and to assist in establishing acceptance criteria where no standard practices are otherwise available
- c. general familiarity with other NDT methods.

Within the scope of competency defined on the certificate ICN Level 3 personnel may be authorized to:

- a. assume full responsibility for a test facility and staff
- b. develop and validate procedures, written instructions and to verify they are technically correct
- c. interpret and evaluate codes, standards, specifications and procedures.
- d. designate the particular test methods, procedures & NDT instructions to be used.
- e. carry out & supervise all tasks at all levels.
- f. provide guidance to NDT personnel at all levels.

5.0 RESPONSIBILITIES

5.1 National Certification Board (NCB):

- a) shall initiate, maintain and promote the certification according to this scheme;
- b) shall administer the procedures and operation for certification in accordance with the Quality Manual System Document;
- c) shall prescribe an obligatory code of ethics, which shall apply to committee members and certificate holders;
- d) shall conduct an initial audit and subsequent periodic surveillance audits of the authorized examination centers to ensure their conformity to this standard;
- e) shall take the ultimate responsibility for the certification scheme including technical and administrative requirements;
- f) shall approve, properly staffed and equipped examination centers, which it shall monitor on a periodic basis;
- g) shall keep all appropriate records related to certification for at least 10 years;
- h) shall identify and train the examiners for administrating the NDT examinations;
- i) shall be responsible for ensuring the security of all examination materials (specimens, master reports, question banks, examination papers, etc.) and shall ensure the examination specimens are not used for training purposes;
- j) shall require all candidates and certificate holders to give a signed undertaking to abide by code of ethics;
- k) shall prepare and update syllabus, question bank for examinations and also maintain the samples for practical examination; and
- l) shall develop and maintain a quality manual which shall outline the quality policy and objectives of NCB-ISNT and also the procedures, work instructions and check-list for its implementation.

5.2 Responsible Agency

Responsible agency shall introduce the candidate to NCB-ISNT and document the validity of the personal information provided including the declaration on education, training and experience used to establish eligibility of the candidate for certification, but shall not be directly involved in the certification process.

The responsible agency shall be fully responsible for:

- a. all that concerns the authorization to operate and conduct job specific training and examination, if required.
- b. issuing written authorization to operate.
- c. the validity of the results of NDT operations, acts and omissions of NDT certified personnel.
- d. ensuring that the annual vision acuity requirements of clause 6.5 are met
- e. verify the continuity in the application of the NDT method without significant interruption.
- f. ensuring that the personnel hold valid certification relevant to the tasks within the organization
- g. maintaining appropriate record of certified personnel.
- h. establishing written procedure covering all the above.

- 5.2.1 If the individual is self-employed, (s)he shall assume all responsibilities described for the responsible agency and shall be required to provide additional documentation to support claims for experience and training, which shall be attested by at least one independent party acceptable to NCB-ISNT.

5.3 Examination Centres

- 5.3.1 Examination centres shall work under the control of NCB-ISNT and apply the documented quality procedure approved by the NCB-ISNT. It shall have the following minimum requirements:
- a. have adequate qualified staff, resources, premises and equipments as required by NCB-ISNT to ensure satisfactory qualification examinations for the levels, methods, and industrial sectors concerned;
 - b. facilitate conduct of examinations by an examiner or proctor authorized by NCB-ISNT.
 - c. apply a documented quality procedure outlined in NCB-ISNT/QMSD/01- Revision 0.
 - d. maintain qualification and examination records as specified by NCB-ISNT

5.3.2 An examination centre can be situated at employer's premises. In this case, examinations shall be conducted only in the presence of and under the control of an authorized representative of NCB-ISNT.

5.4 **Candidate:**

Candidates, shall:

- a. provide documentary evidence of satisfactory completion of training;
- b. provide verifiable documentary evidence that the required experience has been gained under qualified supervision;
- c. provide documentary evidence of vision satisfying the requirements of clause 6.5;
- d. provide documentary evidence of minimum educational qualification
- e. abide by a code of ethics of NCB-ISNT

5.5 **Certificate Holder:**

Certificate holders shall:

- a. abide by a code of ethics of NCB-ISNT;
- b. undergo an annual test of visual acuity in accordance with clause 6.5, and submit the results of tests to the employer;
- c. notify NCB-ISNT and the employer in the event that the conditions for validity of certification are not fulfilled.

6.0 ELIGIBILITY

6.1 **General**

To be eligible for examination, the candidate shall fulfill and provide documented evidence acceptable to NCB-ISNT regarding the minimum education, vision and training requirements. In addition, the candidate shall also fulfill minimum experiences which are specified in this clause prior to certification.

6.2 **Educational Qualification:**

The minimum educational requirements for Level 1 and Level 2 is Class X with science and mathematics. For Level 3, the minimum educational requirements are Diploma in engineering, or two years of science or engineering study during graduation. At the discretion of NCB-ISNT, the candidate not meeting the educational requirements for Level 3 may be allowed to seek certification provided the experience gained by the candidate satisfy the criteria mentioned in 6.3.

6.3 **Experience:**

6.3.1 The minimum duration of experience to be gained in a particular NDT method and sector for which the certification is sought is given in Table 1. When the candidate is seeking certification in more than one method, the total duration of experience shall be the sum of experience for each method.

6.3.2 For individuals seeking direct access to Level 2, the minimum duration of experience to be gained in a particular NDT method shall be the sum of experience period given in Table 1 for Level 1 and Level 2. No reduction in the period of experience is allowed.

6.3.3 For Level 1 and Level 2 if part or fraction of the experience mentioned in Table 1 is sought after the certification examination, the candidate may be allowed at the discretion of NCB-ISNT, to appear in the examination. In such case, the result of the examination may be declared to the candidate, but the certificate shall be withheld, until the time the candidate submits documentary evidence of the experience gained as per the requirements of Table 1. The results of examination shall be valid for a period of 2 years. On submission of the documents related to experience and subjected to meeting other requirements of certification, the candidate may be issued the certificate in the applicable NDT method and sector. The validity of the certificate shall start from the date the certificate is issued. The end date of the validity shall be determined from the date of examination and not from the date when the certificate was issued. It is responsibility of the candidate to inform NCB-ISNT with documentary evidence of experience gained for certification at appropriate level.

6.3.4 For Level 3 certification, the duration of experience specified in the Table 1 is for an individual who holds a diploma or has completed two years of engineering or science graduation course. In case the candidate is not meeting these educational requirements, the minimum experience for such candidates seeking certification shall be two times the requirements given in Table 1.

6.3.5 For individuals seeking access directly to Level 3, the minimum duration of experience to be gained in a particular NDT method shall be the sum of experience period given in Table 1 for Level 1, Level 2 and Level 3. No reduction in the period of experience is allowed.

6.3.6 Documentary evidence of experience shall be confirmed by the employer while submitting it to NCB-ISNT.

6.3.7 Possible Reduction:

When considering possible reduction in the duration of experience, NCB-ISNT will take into consideration the following elements. Any reduction requires acceptance by NCB-ISNT.

a) The quality of experience can be variable, and skills may be assimilated more quickly in an environment where the experience is concentrated and has a high degree of relevance to the certification sought.

b) 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 NDT methods.

c) 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.

d) The level and quality of education possessed by the candidate will also be considered for level 1 and level 2 only. Candidates who have graduated in engineering or science from a technical college or university, the total duration of required experience may be reduced by 50 %

6.3.8 Credit for work experience may be gained simultaneously in two or more NDT methods covered by this Standard, with the reduction of total required experience as follows:

a) two testing methods: reduction of total required time by 25 %;

b) three testing methods: reduction of total required time by 33 %;

c) four or more testing methods: reduction of total required time by 50 %.

In all cases, the candidate shall be required to show that for each of the testing methods for which (s)he seeks certification, (s)he has a minimum of 50% of the time required as given in Table 1.

6.3.9 In all the cases, the candidate shall be required to show that for each of the NDT method and sector combinations for which (s)he seeks certification, (s)he has at least half of the experience required, and this shall never be less than one month in duration.

6.3.10 When the certification sought is limited in application (e.g. thickness measurement or automated testing), experience duration may be reduced by up to 50% but shall not be less than one month.

6.4 Training: Levels — 1, 2 and 3

6.4.1 To be eligible to apply for certification in NDT method, the candidate shall provide evidence of satisfactory completion of training program in the method and sector for which the certification is sought.

6.4.2 The minimum duration of training to be undertaken by the candidate for certification in various NDT methods for Level 1, 2 and 3 are given in Table 2.

- 6.4.3 The syllabus of the training shall be as per NCB-ISNT/ICN/Syllabus/rev 0
- 6.4.4 The training hours indicated in Table 2 are inclusive of theory and practical training.
- 6.4.5 For Level 3 certification, in addition to the training in NDT method, training in Basic is mandatory. This training is required only once, at the time of first Level 3 certification. The Basic training need not be repeated if the candidate holds a valid Level 3 certificate in some method(s) and is seeking Level 3 certification in other NDT method(s). Candidates, whose Level 3 certificate has expired, will be treated as fresh candidates for considering the training requirements.
- 6.4.6 Reduction in training hours
- 6.4.6.1 The possible reductions in training duration are described below, provided that, when several reductions are applicable, the total reduction does not exceed 50 % of the training duration. Any reduction requires acceptance by NCB-ISNT.

For all levels:

a) Candidates seeking certification in more than one surface NDT method (e.g. MT, PT, VT), or those who are 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;

b) 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, the total required number of training hours may be reduced by up to 50 %.

NOTE: It is appropriate for the subject to be relevant to the NDT method (chemistry, mathematics or physics) and/or to the product or industry sector (chemistry, metallurgy, engineering, etc.).

For Levels 1 and 2, when the certification sought is limited:

c) in application (e.g. automated ET, UT of bar, tube, and rod or normal beam ultrasonic thickness gauging and lamination testing of rolled steel plate); in technique (e.g. RT using only radiography); the training duration may be reduced by up to 50 %.

d) For direct access to Level 2 RT when certification is restricted to the film interpretation and to only one product sector, the minimum training requirement of 56 hours applies.

6.5 Vision Requirements

- 6.5.1 Candidates shall provide documented evidence of satisfactory vision in accordance with the following requirements:
- Near vision acuity shall permit reading a minimum of Jaeger Number 1 (Jaeger test chart) or Times Roman N 4.5 or equivalent letters at a distance of not less than 30 cm on a standard Jaeger test chart with one or both eyes, either corrected or uncorrected;
 - Colour vision shall be sufficient that the candidate can distinguish and differentiate contrast between the colours and shades of grey (for RT) used in the NDT method concerned, as specified by the employer
- 6.5.2 Vision test shall be certified by a qualified medical personnel and Colour vision including shades of grey shall be certified by a qualified medical personnel or an individual certified to Level 3 by this or other recognised certification standard such as IS 13805, PCN, CSWIP, ACCP, ASNT etc., or the employer.
- 6.5.3 Subsequent to certification, the tests of visual acuity shall be carried out annually by the employer.

Table 1
Minimum Experience Requirements — Level 1, Level 2 and Level 3 (Clause 6.3)

NDT Method	Experience Months		
	Level 1	Level 2 (2)	Level 3 (2a)
MT	1	3	12
PT	1	3	12
RT	3	9	18
UT	3	9	18
VT	1	3	12

- 1) Work experience in months is based on a nominal 40 h/week. When an individual is working in excess of 40 h per week, (s)he may be credited with experience based on the total hours, but he/she is required to produce evidence of this experience.
- 2) If the individual is seeking direct certification to Level 2, with no time at Level 1, the experience shall consist of the sum of the experience required for Level 1 and Level 2.
- 2a) If an individual is seeking direct certification to Level 3, with no time at Level 1 or 2, the experience shall consist of the sum of the experience required for Level 1, 2 and Level 3.
- 3) Experience duration may be reduced by up to 50 percent, but under no circumstances it shall be less than one month when the certification sought is limited in application (for example, UT wall thickness gauging).
- 4) Credit for work experience may be gained simultaneously in two or more NDT methods covered by this standard, with the reduction of total required experience as follows:
- Two testing methods — reduction of total required time by 25 percent.
 - Three testing methods — reduction of total required time by 33 percent.
 - Four or more testing methods — reduction of total required time by 50 percent.
- In all cases, the candidate shall be required to show that, for each of the testing methods for which (s)he seeks certification, has at least half of the time required.
- 5) for level 1 and level 2 only : Candidates who have graduated in engineering or science from a technical college or university, the total duration of required experience may be reduced by 50%
- 6) Minimum educational qualification is X standard (with Science and Maths).
- 7) The maximum possible reduction in duration of experience shall be limited to 50 percent.

Table 2
Minimum Training Requirements (Hours) (Clauses 6.4)

NDT Method	Level 1		Level 2		Level 3
	THEOREY	PRACTICAL	THEOREY	PRACTICAL	
MT	11	5	16	8	32
PT	9	7	15	9	24
RT	22	18	65	15	40
UT	24	16	48	32	40
VT	9	7	16	8	24

- a)** For all levels:
for candidates seeking certification in more than one 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;
- b)** 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, the total required number of training hours may be reduced up to 50 % in Theory part. No reduction permitted in practical training hours.
- NOTE: It is appropriate for the subject to be relevant to the NDT method (chemistry, mathematics or physics) and/or to the product or industry sector (chemistry, metallurgy, engineering, etc.).
- c)** For Levels 1 and 2, 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); in technique (e.g. RT using only radioscopia); the training duration may be reduced by up to 50 %.
- d)** 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 hours applies.

6.6 Direct access to level 3:

Candidates seeking direct access to Level 3 or candidates whose Level 2 certificate have expired at the time of application for Level 3, shall have to successfully clear Level 2 practical examination of that method and sector (s) before they are allowed to appear for Level 3 examination.

7.0 QUALIFICATION EXAMINATIONS for Level 1 and Level 2 —CONTENT AND GRADING

7.1 General

The qualification examination administered under this standard shall include a general examination, a specific examination and a practical examination in the method and sector(s) for which certifications is sought.

7.1.1 General Examination

7.1.1.1 The General examination is meant to test candidate’s knowledge on the principles, equipments, applications, advantages and limitations of the NDT method for which certification is sought.

7.1.1.2 The General examination shall include questions selected in an unpredictable way from the NCB-ISNT’s validated question bank.

7.1.1.3 The General examination shall have the format of ‘Multiple Choice Questions’ (MCQ).

7.1.1.4 The total number of questions for Level 1 and Level 2 General Examination paper for different methods are given in Table 3

7.1.1.5 The examination shall be a ‘closed book’

**Table 3
Number of Questions for General Examination for Level 1 and 2 (Clause 7.1.1.4)**

NDT Method	No. of Multiple Choice Questions	
	Level 1	Level 2
Magnetic particle testing	40	40
Penetrant testing	40	40
Radiographic testing	40	40
Ultrasonic testing	40	40
Visual testing	40	40

7.1.2 Specific Examination

7.1.2.1 The specific examination is meant to test the candidate’s knowledge on the practical aspects of the NDT method and sector for which the certification is sought.

7.1.2.2 The specific examination shall include multiple choice questions related to the sector(s) selected in an unpredictable way from the NCB-ISNT’s validated question bank. The specific examination paper shall also include questions involving calculations, NDT procedures and questions on codes, standards, specifications and acceptance standard.

7.1.1.3 The total number of questions for Level 1 and Level 2 Specific Examination paper for each method is given in Table 4.

**Table 4
Number of Questions for Specific Examination for Level 1 and Level 2 (Clause 7.1.1.3)**

NDT Method	No of Questions	
	Level 1	Level 2
Magnetic particle testing	20	20
Penetrant testing	20	20
Radiographic testing	20	20
Ultrasonic testing	20	20
Visual testing	20	20

7.1.3 Practical Examination

- 7.1.3.1 The practical examination is meant to test the candidate's ability in application of the NDT method for real-life situations. During practical examination, the candidate is required to set the test equipment, perform the test, detect the flaws (also interpret for Level 2) and report the results in the prescribed format.
- 7.1.3.2 The specimens for practical examination shall conform to the NDT method and sector for which certification is sought. For example, if the certification is sought for weld sector, all the practical examination test specimen shall consist of welds
- 7.1.3.3 The test specimen used for the training purposes shall not be used for examination.
- 7.1.3.4 Each specimen shall be uniquely identified by permanent means and have a master report, which includes the equipment settings, calibration details, the number and location of flaws in the test specimen and their characteristics determined by the applicable NDT method.
- 7.1.3.5 The master report of each examination test specimen shall be generated by NCB-ISNT based upon the results of at least two independent tests, and shall be validated by a method & sector specific Level 3 certificate holder for use in the grading examinations. The records of these independent reports shall be maintained by NCB-ISNT.
- 7.1.3.6 Specimens shall be sector specific and contain discontinuities characteristic of those which occur during manufacturing or in service. Discontinuities may be natural, artificial or implanted and the marking shall be concealed from the candidate.
- 7.1.3.7 For Level 2 evaluation tasks, data sets or films may be used instead of real specimens.
- 7.1.3.8 Specimens used for measurement or calibration (eg. Thickness or Coating measurement), the specimens need not contain discontinuities
- 7.1.3.9 For RT practical examination, the specimen shall contain discontinuities. The ability of the candidate to detect and evaluate the discontinuities in the RT film can be assessed during film interpretation task.
- 7.1.3.10 The requirements for the number of the specimens and the areas or volumes to be tested in Level 1 and 2 practical examination are given in Tables 5.
- 7.1.3.11 Level 1 candidate shall follow the NDT instruction(s) provided by the examiner while carrying out the test on the examination specimen.
- 7.1.3.12 Level 2 candidate shall select the NDT technique and determine the testing parameters for examination of the test specimen as per the given procedure or specifications.
- 7.1.3.13 For examinations, where discontinuities are normally replaced by artificial sources or data, Level 1 candidate shall demonstrate the ability to set-up and calibrate the equipment, verify its sensitivity and record the test data. Level 2 candidate shall also demonstrate the ability to interpret and evaluate previously recorded test data in addition to the requirements for Level 1.
- 7.1.3.14 The time allowed for Level 1 and Level 2 practical examination for different techniques are given in the Table 6:
- 7.1.3.15 In addition to the test performed on the specimen, Level 2 candidates shall draft at least one NDT Instruction suitable for Level 1 personnel for the specimen(s) described in the examination. The instruction shall be prepared based on the given specification.

Table 5
Number and Type of Test Specimens for the Levels 1 and 2 Practical Examination (Clause: 7.1.3.10)

Method and Level Product Sectors	MT1	MT 2	PT 1	PT 2	RT1	RT2	UT 1	UT 2	VT1	VT2
Welds	2	2	2	2	2	2 + 12 radiographs	2	2	2	2
Notes : 1. The specimens used for practical examination shall be different in character, e.g. in product form, material specification, shape, size, and discontinuity type, from each other. 2. A set of 12 radiographs shall be considered as one specimen.										

Table 6
Maximum Time for Practical Examination for Level 1 and Level 2 (Clause: 7.1.3.14)

NDT Method	Time for Practical Examination (hrs.)	
	Level 1	Level 2
Magnetic particle testing	2	3
Penetrant testing	2	3
Radiographic testing	3	4
Ultrasonic testing	3	4
Visual testing	2	3

7.2 Grading for Level 1 and Level 2 examination

7.2.1 Each part of theory and practical examination shall be graded separately.

7.2.2 Theory examination comprises of General & Specific examination. To be certified, the candidate shall obtain a minimum of 70 percent in each part of theory examination.

7.2.3 Practical examination comprises of performing tests on two specimen & drafting at least one NDT Instruction suitable for Level 1 personnel for the specimen(s) described in the examination based on the given specification. To be certified, the candidate shall obtain a minimum of 70 percent in each specimen and written instruction. To be certified to RT level 2 without RT Level 1, the candidate shall obtain a minimum of 70 percent in practical 1 and practical 2 specimen, set of 12 radiographs and written instruction.

7.2.4 The grading of practical examination and instruction writing shall be carried out as per the criteria given in Table 7

Table 7		
Guidance on the percentile weighting for practical examination of Levels 1 and 2 (Clause 7.2.4)		
Subject	Level 1	Level 2
Part 1 — Knowledge of the NDT apparatus:		
a) system control and functional checks;	10	5
b) verification of settings.	10	5
Total	20	10
Part 2 — Application of the NDT method:		
a) preparation of the specimen (e.g. surface condition), including visual examination;	5	2
b) for Level 2, the selection of the NDT technique and determination of operating conditions	n/a	7
c) setting up of the NDT apparatus;	15	5
d) performance of the test;	10	5
e) post test procedures (e.g. demagnetization, cleaning, preservation).	5	1
Total	35	20
Part 3 — Detection of discontinuities and reporting:a		
a) detection of mandatory reportable discontinuities;	20	15
b) characterization (type, position, orientation, apparent dimensions, etc.);	15	15
c) Level 2 evaluation against code, standard, specification or procedure criteria;	n/a	15
d) production of the test report.	10	10
Total	45	55
Part 4 — NDT instruction writing (Level 2 candidates):b		
a) foreword (scope, reference documents);	-	1
b) personnel;	-	1
c) apparatus to be used, including settings;	-	3
d) product (description or drawing, including area of interest and purpose of the test);	-	2
e) test conditions, including preparation for testing;	-	2
f) detailed instructions for application of the test;	-	3
g) recording and classifying the results of test;	-	2
h) reporting the results.	-	1
Total	-	15
Overall grade for practical examination	100%	100%
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. b) The Level 2 candidate is required to produce an NDT instruction, suitable for Level 1 personnel, for a specimen selected by the examiner.		

7.3 QUALIFICATION EXAMINATIONS for Level 3: CONTENT AND GRADING

7.3.1 Examination content

The qualification examination for Level 3 candidates shall consist of written examination on Basic and applicable NDT method. Basic examination is required only once. Candidate holding valid ICN Level 3 certificate is exempt from the need to retake the Basic examination.

7.3.2 Basic examination

Basic examination consists of three parts, part A, B & C. The number of questions in each part shall be as follows:

Part A: 40 questions on material, processes, discontinuities, metallurgy, material testing, metrology, QA, etc;

Part B: 50 questions based on knowledge of NDT methods covered in syllabus ; and

Part C: 10 questions on knowledge of this standard. This part may be open book.

The Basic examination shall include only multiple choice questions selected in an unpredictable way from the NCB-ISNT's question bank.

The Basic examination should be passed once and remains valid, provided that the first main method examination is passed within five years after passing the Basic examination.

7.3.3 Method examination:

Method examination consists of three parts, part 1, 2 & 3. The number of questions in each part shall be as follows:

Part 1 shall have 80 multiple choice questions on principles, equipments, techniques, applications and advances of particular NDT method selected in an unpredictable way from the NCB-ISNT's question bank.

Part 2 shall have 20 multiple choice questions on application of NDT method in that sector, interpretation of indications and interpretation of code/specification selected in an unpredictable way from questions related to the sector(s) from the NCB-ISNT's question bank.

Part -3 shall consist of drafting one or more satisfactory NDT procedures in industrial sector concerned.

Part 2 & 3 shall be based on specification given in the examination.

If candidate is appearing for more than one specific examination in a particular NDT method, (s)he shall appear separately for part 2 & part 3 only.

7.3.4 Grading

Basic examination shall be graded separately so that the candidate may be examined later for certification in another method without having to repeat the Basic examination.

To pass the Basic and method examination, a candidate shall obtain a grade of at least 70 percent in each part of the examination.

To be certified, the candidate must pass Basic as well as Method examination. To be certified in any other NDT method, candidate can appear in 'Method' examination only. To be certified for additional specific sector in a particular method, candidate shall pass in part 2 and part 3 of method examination.

8.0 Conduct of Examinations

All examinations shall be conducted in examination centres approved by the NCB-ISNT and shall be monitored by NCB-ISNT.

For the examination, the candidate shall have in his /her possession valid proof of identification (government issued photo ID card) and an admit card issued by NCB-ISNT.

Any candidate who during the course of the examination does not abide by examination rules, or who perpetrates or is an accessory to fraudulent conduct, shall be excluded from further participation for that exam.

Level 1, 2 and 3 examinations shall be conducted and supervised by an examiner/ invigilator/proctor designated by NCB-ISNT. The examiner may be assisted by one or more invigilators placed under his/her responsibility with prior written permission from NCB-ISNT.

NCB- ISNT approved examiner shall validate and approve examination papers prior to examination. The grading of examination shall be done by examiner using the procedures approved by NCB-ISNT.

A candidate for a practical examination may use his/her own apparatus. The examiner should investigate the reliability of the test apparatus made available to the candidate. Unreliable apparatus as well as any apparatus that may be rendered unserviceable during the course of the examination should be replaced.

The procedure for marking the results of theory and practical examinations shall be developed and approved by NCB-ISNT.

Examiner shall not be part of training program for which the examination is being conducted.

8.1 Re-examination (for level 1, 2 & 3)

A candidate failing for reason of unethical behavior must wait at least 12 months before re-applying.

A candidate who failed to obtain the passing grades in any examination part may take two re-tests in the failed parts after one month and within 24 months from the date of original examination, without undergoing additional training. The candidate may be allowed to undertake retests within one month period, provided additional training acceptable to NCB-ISNT is satisfactorily completed by the candidate in the 'failed part'. In the case of failure in both re-tests and failing to take permitted re-examination, the candidate shall take examination according to the procedure applicable to new candidates.

NOTE: "Examination parts" in this context refers to: for Level 1 and 2, the General, Specific, and Practical examinations; for the Level 3 Basic examination, Parts A, B, and C; for the Level 3 method examination, Parts 1, 2, and 3.

9.0 CERTIFICATION

9.1 Administration

Based on the results of the qualification examination, NCB-ISNT, shall issue certificates to the successful candidates.

9.2 Certificates

Certificates shall bear:

- a) Full name of the certified individual;
- b) Date of initial (DD/MM/YYYY) certification;
- c) Date (DD/MM/YYYY) upon which certification expires;
- d) Reference to this standard
- e) Name of NCB-ISNT
- f) Level of certification;

- g) NDT method;
- h) Applicable sector (s) concerned;
- i) If applicable, the scope of limitations to the certification and/or special applications
- j) A unique identification number;
- k) Signature of the certified individual;
- l) Photograph of the certified individual;
- m) Seal of NCB-ISNT cancelling the photograph to avoid falsification; and
- n) Signature of a designated representative of the NCB-ISNT.

9.3 Validity

The period of validity of the certificate shall be five years from the date of certification. The validity date shall be indicated on the certificate.

Certification shall be invalid:

- a) At the option of NCB-ISNT after reviewing evidence of unethical behavior.
- b) if the individual becomes physically incapable of performing his/her duties
- c) significant interruption (as defined in clause 3.31) takes place in the individual's work within the scope of the certificate;
- d) if the individual fails to meet the vision acuity requirements mentioned in clause 6.5.

9.4 Revalidation

a. If the certificate is invalid as per clause 9.3 a), the candidate, at the discretion of NCB-ISNT will be allowed to re-apply for certification examination not sooner than 24 months.

b. If the certificate is invalid as per clause 9.3 b) or c), the candidate, at the discretion of NCB-ISNT will be allowed to re-apply for recertification examination after submission of satisfactory documented evidence that the candidate is physically capable of performing his/her duties.

The certification is revalidated for a new period of validity of five years from the date of the revalidation.

9.5 Renewal

Prior to completion of first period of validity, and every 10 years thereafter, certification may be renewed by NCB-ISNT, for an additional period of five years from the date of expiry provided the individual meets the following criteria:

- a) Provides evidence of satisfactory vision examination (taken within preceding 12 months); and
- b) Provides verifiable evidence of continued satisfactory work activity without significant interruption.

If the criterion b) for renewal is not met, the individual shall follow the same rules as applicable for recertification.

Applications for renewal can be made up to 6 months before the date of expiry. As an exception and based on discretion of NCB-ISNT, applications presented within 12 months after the date of expiration may be considered for renewal. Beyond this period, no renewal is permitted and the candidate shall take recertification examination.

9.6 Recertification

9.6.1 General

Prior to the completion of each second period of validity (every 10 years), the certified individual may be recertified by NCB-ISNT for a new period of five years or less, provided the individual meets the criterion for renewal specified in 9.5 a) and meets the applicable conditions described below.

It is the responsibility of certificate holders to initiate the process of 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.

9.6.2 Level 1 and 2

9.6.2.1 Levels I and II certificate holders seeking recertification shall meet the criterion for the renewal specified in 9.5 and satisfy 9.6.1

9.6.2.2 The individual shall successfully complete a practical examination which demonstrates continued competence to carry out work within the scope defined on the certificate. This shall include testing specimens (see Table 5) appropriate to the scope of certification to be revalidated and in addition, for Level 2, the production of a written instruction suitable for the use of Level 1 personnel (see Clause 7.2.4). If the individual fails to achieve a grade of at least 70 % for each specimen tested (weighted according to the guidance in Table 7), and, for Level II, for the instruction, two re-tests of the whole recertification examination shall be allowed after at least 7 days and within six months of the first attempt of the recertification examination.

In the event of failure in the two allowable re-tests, 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 virtue of any other valid certification held.

9.6.3 Level 3

Level 3 certificate holders seeking recertification shall provide evidence of continued qualification confirmed by:

- a) satisfying the Level 3 requirements of 7.3 for a written examination;
- b) meeting the requirements for a structured credit system, given in Table 8.

9.6.3.1 The individual may decide between the examination or credit system for recertification. If the credit system is chosen, which requires submission of employer's documents or access to an employer's premises, the individual shall provide to NCB-ISNT a written statement of approval from the employer.

9.6.3.2 In both cases (written examination or credit system), the individual shall either provide appropriate documented evidence, acceptable to NCB-ISNT of his/her continued practical competence in the method or pass a Level 2 practical examination, as specified in Table 7, except for the drafting of NDT instructions.

9.6.3.3 If an individual chooses the option of examination for the purpose of re-certification, he/she shall successfully complete an examination that includes a minimum of 20 questions on the application of the test method in the sector(s) concerned which demonstrates an understanding of current NDT techniques, standards, codes or specifications, and applied technology and, at the option of NCB-ISNT, five additional questions on the requirements of the certification scheme.

9.6.3.4 If the individual fails to achieve a grade of at least 70 % in the recertification examination, a maximum of two retests of the recertification examination shall be allowed. The time period within which all tests are to be taken shall be 12 months.

9.6.3.5 In the event of failure in the two allowable retests, the certificate shall not be revalidated and, to regain certification for that sector and method the candidate shall be required to achieve success in the appropriate main method examination.

9.6.3.6 A candidate who applies for recertification and does not meet the requirements of the credit system shall be recertified in accordance with 9.6.3.3. In the event of failure at the first attempt at recertification by examination, only one retest of the recertification examination shall be allowed within 12 months of the date of application for recertification via the structured credit system.

Table 8 Credit System for Level III Re-certification (Clause 9. 6.3)

Table 8— Structured credit system for Level 3 recertification				
Item	Activity	Points accorded for each item (or function)	Maximum points per year per item	Maximum points per 5 year period per item
1	Membership of an NDT society, attendance at seminars, symposia, conferences and/or courses covering NDT and related sciences and technologies	1	3	8a
2.1	Attendance at international and national standardization committees meetings	1	3	8a
2.2	Convenorship of standardization committees	1	3	8ab
3.1	Attendance at sessions of other NDT committees	1	3	8a
3.2	Convenorship of sessions of other NDT committees	1	3	8ab
4.1	Attendance at sessions of NDT related working groups	1	5	15a
4.2	Convenorship of NDT related working groups	1	5	15ab
5.1	NDT related technical/scientific contributions or publications	3	6	20cd
5.2	NDT related research work published	3	6	15cd
5.3	Documented NDT research activity	3	6	15cd
6	NDT technical instructor (per 2 h) and/or NDT examiner (per examination)	1	10	30d
7	Professional activity			
7.1	within a NDT facility, NDT training centre or NDT examination facility or for Engineering of NDT.	10	10	40d
7.2	Dealing with disputes referring to clients	1	1	15d
7.3	Development of NDT applications	1	1	15d
a. Maximum points for items 1 to 4 : 20. b. Points to be given for both convenorship and attendance. c. If there is more than one author, the lead author shall define points for the other authors. d. Maximum points for each of items 5 and 6: 30, and 7: 50. Note: To be re-certified, it is necessary to gain a minimum of 30 points in a 5 year period. A maximum of 10 points per year will be allowed.				

9.7 SUSPENSION AND WITHDRAWAL :

9.7.1 The following reasons are considered grounds for suspension:

- Major non-conformance(s) or effective corrective action not implemented within a specified time period.
- Improper use of the certificate, symbol, or logo, which is not meeting the requirements or against the ethics of National Certification Board
- Certified person ceases to supply services of the certified quality for an extended period of time.
- Certified person has persistently failed to meet any of the requirements for certification including requirements for the effectiveness.
- Infringement by the certified person of any contractual conditions between the certified person and National Certification Board.

9.7.2 The following reasons are considered grounds for or cancellation

- Certified person is unable or unwilling to ensure conformance to revisions requirements of standards.
- Existence of a serious complaint, or a large number of third party complaints.
- Use of Certificates issued by NCB ISNT as a license leads to withdrawal of certificate.
- Certified person shall not sign documents for work for which he/she shall not have personal professional knowledge and direct technical supervisory control and responsibility.
- The certified person shall not knowingly associate with, or permit the use of his/her name or

firm name in a business venture by any person or firm which he/she knows or has a reason to believe engaging in business or professional practices of a fraudulent or dishonest nature.

10.0 FILES

NCB-ISNT shall maintain either in hard copy form or read only digitized (electronic) form the following:

- a) an updated list of all certified individuals classified according to level, test method and sector(s);
- b) to maintain a file for the candidate who has not been certified, for at least five years from the date of application and
- c) Files containing following for the certified individual and for the individual whose certificate is invalid or inoculated:
 - 1) Application forms;
 - 2) Photograph or digital image (taken within past 10 years)
 - 3) Examination documents, including questionnaires, answers, description of specimens, records, results of test, written procedures and/or techniques, and grade sheets;
 - 4) Renewal documents, including evidence of vision requirements and continuous activity; and
 - 5) Reasons and penalty for any withdrawal of certification.

NOTE — Files shall be kept under suitable conditions of safety and confidentiality as long as the certificate remains valid and for at least 5 years after certification has lapsed.

11.0 TRANSITION PERIOD

The aim of this clause is to permit the initiation of the system when NCB-ISNT applies the certification scheme to an NDT method, which is not yet covered within this standard or when a new sector is created. NCB-ISNT may temporarily appoint, for a period not exceeding five years from the date of implementation of the new method or sector, duly qualified personnel as examiners for the purpose of conducting, supervising and grading the qualification examinations. The five year implementation period is not to be used by NCB-ISNT as a means to certify candidates who do not meet all the qualification and certification requirements of this standard.

Duly qualified personnel mean that such personnel:

- 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.

Within two years of the date of appointment, these examiners shall have gained certification by satisfying the requirements for recertification.