SINGAPORE NDT
NDTSS
CERTIFICATION

NON-DESTRUCTIVE TESTING SOCIETY (SINGAPORE)
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Quality Assurance Documents

Scheme Manual – SGNDT Certification

Requirements for Qualification & Certification of NDT Personnel

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1 GENERAL INFORMATION

1.1 INTRODUCTION

The Qualification and Certification of Non-Destructive Testing Personnel is carried out in accordance with the international standards ISO 9712:2021 and ISO 20807, latest editions.

The National Certification committee managing certification to ISO 9712 and ISO 20807 is the Non-Destructive Testing Society Singapore (NDTSS) Certification Committee.

The purpose of this Guide is to provide information for NDT practitioners and other interested parties on the requirements, procedures and arrangements that apply to the ISO 9712 and ISO 20807 Qualification and Certification Schemes.

The NDTSS in future offer an in-house limited qualification scheme for operators of electrical resistance equipment to heat treat welds in steel. Certification of this process has been based on the general requirements of ISO 20807.

NOTE: All references to standards in this document relate to the latest edition of that standard.

1.2 THE NDTSS CERTIFICATION COMMITTEE

NDTSS operates the qualification and certification scheme through the Certification committee of NDTSS.

The Executive committee of the NDTSS constitutes a Certification committee and delegates to it the responsibility for maintaining a management overview of the operations of its Certification Schemes. Membership of NDTSS committees is open to the participation of financial members and individuals representing stakeholder organisations. Further information on the work of committees and committee membership is available from The Certification committee of the NDTSS. The committee fulfils the requirement for a Scheme Committee in terms of ISO/IEC 17024 (Personnel Certification)

The NDTSS NDT Certification Committee comprises: -

- The Chairman (an independent person with considerable NDT experience).
- The President.
- 4 Committee Members, at least 2 of the committee members shall hold NDT Level 3

The Certification Committee is supported by an Administrator and:

- A Panel of Examiners. This panel, under the direction of its chairman is responsible for the database of examination questions and the management of the NDTSS' database listing, of approved examiners. NDTSS Currently uses the ICNDT Databank of Questions for General examination and specific examination as applicable.

Certification decisions for NDT personnel are the responsibility of the Certification Committee and are not delegated or subcontracted to another body.

The NDTSS is accredited by the Singapore Accreditation Council as a Personnel Certifying Body in accordance with ISO /IEC 17024:2012.

1.3 SCOPE

This document describes the NDTSS process for the qualification and certification of personnel who perform industrial non-destructive tests.

Specific details of the certification available at each level in the various NDT methods and industry/product sectors are contained within this document.

1.4 REFERENCES

1.4.1 Standards

- ISO/IEC17024:2012- General requirements for bodies operating certification systems of persons
- CEN ISO/TR 25107: Non-destructive testing – Guidelines for NDT training syllabuses (ISO/TR 25107)
- CEN ISO/TR 25108: Non-destructive testing – Guidelines for NDT personnel training organisations (ISO/TR 25108)
- ISO 9712-2021: Non-destructive testing - Qualification and certification of personnel

1.5 TERMS AND DEFINITIONS

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

1.5.1 Authorised qualification body

Body, independent of the employer, authorized by the certification body to prepare and administer examinations

1.5.2 Basic examination

Written examination, at Level 3, which demonstrates the candidate's knowledge of the materials science and process technology and types of discontinuities, the specific qualification and certification system, and the basic principles of NDT methods as required for Level 2.

1.5.3 Candidate

Applicant who has fulfilled specified prerequisites and has been admitted to the certification process.

1.5.4 Certificate

Document in the form of a letter issued by a certification body under the provisions of this document, indicating that the named person has fulfilled the certification requirements.

1.5.5 Certification process

Activities by which NDTSS determines that a person fulfils certification requirements, including application, assessment, decision on certification, renewal, recertification and use of certificates and logos/marks.

1.5.6 Certification committee

Body that administers procedures for certification according to specified requirements

1.5.7 Employer

Legal entity by whom the candidate is employed

A candidate may be self-employed.

1.5.8 Examination centre

Centre approved by the certification committee where examinations are carried out

1.5.9 Examiner

Person competent to conduct and score an examination, where the examination requires professional judgement. He shall be certified to Level 3 in the method in the product or industrial sector for which they are authorised by the certification committee to conduct and score the examination.

1.5.10 Examination

mechanism that is part of the assessment which measures a candidate's competence by one or more means

1.5.11 General examination

Written examination, at Level 1 or Level 2, concerned with the principles of an NDT method

1.5.12 Industrial experience

Work activities performed under supervision in the NDT method in the sector concerned, needed to acquire the skill and knowledge to fulfil the provisions of qualification.

1.5.13 Invigilator

Person authorised by the certification committee to supervise an examination but does not evaluate the competence of the candidate

1.5.14 Job-specific training

Training, provided by the employer (or his agent) to the certificate holder in those aspects of non-destructive testing specific to the employer's products, NDT equipment, NDT procedures, and applicable codes, standards, specifications and procedures, leading to the award of operating authorisations

1.5.15 Main-method examination

Written examination, at Level 3, which demonstrates the candidate's general and specific knowledge, and the ability to write NDT procedures for the NDT method as applied in the industrial or product sector(s) for which certification is sought

1.5.16 Multiple choice examination question

Wording of a question giving rise to potential replies, only one of which is correct, the remaining being incorrect or incomplete

1.5.17 NDT instruction

Written description of the precise steps to be followed in testing to an established standard, code, specification or NDT procedure

1.5.18 NDT method

Discipline applying a physical principle in Non-destructive Testing (eg. Ultrasonic testing)

1.5.19 NDT procedure

Written description of all essential parameters and precautions to be applied when non-destructively testing products in accordance with standard(s), code(s) or specification(s)

1.5.20 NDT technique

Specific way of utilising an NDT method (eg. Immersion ultrasonic testing).

1.5.21 NDT training

Process of instruction in theory and practice in the NDT method in which certification is sought, which takes the form of training courses to a syllabus approved by the certification committee

1.5.22 Operating authorisation

Written statement issued by the employer, based upon the scope of certification, authorising the individual to carry out specified tasks

Note: such authorisation can be dependent on the provision of job-specific training.

1.5.23 Practical examination

Assessment of practical skills, in which the candidate demonstrates familiarity with, and the ability to perform, the test

1.5.24 Qualification

demonstrated education, training, and work experience

1.5.25 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

1.5.26 Sector

Particular section of industry or technology where specialised NDT practices are used, requiring specific product-related knowledge, skill, equipment or training
Note: A sector can be interpreted to mean a product (welded products, castings) or an industry (aerospace, in-service testing).

1.5.27 Significant interruption

Absence or change of activity which prevents the certified individual from practising the duties corresponding to the level in the method and the sector(s) within the certified scope, for either a continuous period in excess of one year or two or more periods for a total time exceeding two years
Note: Legal holidays or periods of sickness or courses of less than 30 days are not taken into account when calculating the interruption.

1.5.28 Specific examination

Written examination, at Level 1 or Level 2, concerned with testing techniques applied in a particular sector(s), including knowledge of the product(s) tested and of codes, standards, specifications, procedures and acceptance criteria

1.5.29 Specification

Document stating requirements

1.5.30 Specimen

Sample used in practical examinations, possibly including radiographs and data sets, which is representative of products typically tested in the applicable sector
Note: A specimen can include more than one area or volume to be tested.

1.5.31 Specimen master report

Model answer, indicating the optimum result for a practical examination given a defined set of conditions (equipment type, settings, technique, specimen, etc.) against which the candidate's test report is graded

1.5.32 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

1.5.33 Renewal

Procedure for revalidation of a certificate without examination at any time up to five years after success in an initial, supplementary or recertification examination

1.5.34 Recertification

Procedure for revalidation of a certificate by examination or by otherwise satisfying the certification committee that the published criteria for recertification are satisfied.

1.6 FURTHER INFORMATION

NDT practitioners, and other interested parties seeking more information or current application forms are asked to contact:

The Certification Administrator, NDTSS Certification Committee office:
Mail: #02-21, 9 Jurong Townhall Road, Singapore-609431
Telephone: +65 62570327
Email: certification@NDTSS.org.sg

Alternatively, application forms, and a copy of this guide can be downloaded from the Society's website – www.NDTSS.org.sg

1.7 RESPONSIBILITIES

1.7.1 Responsibilities of the Certification committee (NDTSS)

NDTSS will fulfil the requirements of ISO/IEC 17024:2012 and will ensure that the NDTSS Scheme(s) for qualification and certification of personnel, are controlled and operated so as to ensure, amongst other things, that they are impartial, and that decisions taken and implemented at all levels, including management and committees, are free from commercial or other pressures that may prevent the objective provision of certification services.
Applicants are required to pass written and practical examinations in the relevant NDT method, product and industry sector depending upon the level of certification sought.
These examinations may be conducted by NDTSS or by an Authorised Qualifying Body (AQB). Candidates may sit NDTSS approved examinations through AQBs or a CB Approved Examination Centre (AEC). Examination fees for NDTSS examinations are detailed in section 4 of this document.
AQB fees and charges might be varied and can be obtained from the appropriate AQB, a list of AQB's is available on the NDTSS web site.
https://ndtss.org.sg/training-certification/list-of-centers-update-02-2019/

Applicants are expected to finalise qualification and certification no later than two (2) years from the date of examination. Applicants who have not finalised certification after 2 years has elapsed from the first examination date or have failed a second resit shall be required to sit all examinations as for a new candidate. Applicants who can prove exceptional circumstances may have an exemption granted by the CB but may be required to resit the practical exam.

Candidates lacking the required industrial experience are encouraged to apply for trainee status within this two (2) year period. Trainees may accumulate industrial experience over a 5-year period but must finalise certification before 5 years has elapsed from the first examination date. In all cases, recertification will be required after 10 years from the date the practical examination was successfully completed.

Candidates who have failed a second attempt shall be required to sit all examinations as for a new candidate.

1.7.2 Responsibility of the Employer

An NDTSS method specific certificate does not authorise the individual to perform work. It is the employer's responsibility to ensure the certificated person is appropriately trained and experienced to conduct specific job tasks. This may involve specific training in company test procedures, use of specialised equipment, OH&S processes etc.
Some tasks associated with or are a necessary precursor to the NDT test may require specific licenses from regulatory bodies, e.g. licence to operate radioactive isotopes, electrical registration and licence to work on live systems.
Note: where the certificated person is self-employed then he assumes the same responsibility of an employer.

ISO 9712 identifies employer responsibilities including:
The employer shall confirm the validity of the personal information provided by the candidate to the NDTSS or the authorized qualifying body. This information shall include the declaration of education, training and experience needed to determine the eligibility of the candidate. If the candidate is unemployed or self-employed, the declaration of education, training and experience shall be attested to by one or more independent parties.

1.7.3 In respect of certified personnel under their control, the employer shall be responsible for:

- All that concerns the authorisation to operate, i.e. providing job-specific training (if necessary)
- Issuing the written authorisation to operate
- The results of NDT operations
- Ensuring that the annual visual acuity requirements of are met
- Verifying continuity in the application of the NDT method without significant interruption
- Ensuring that personnel hold valid certification and approvals relevant to their tasks within the organisation
- Maintaining appropriate records.

1.7.4 Authorised qualification body

Where established, the authorised qualification body shall:

- Work under the control of and apply the specifications issued by NDTSS
- Be independent of any single predominant interest
- Ensure that it is impartial with respect to each candidate seeking qualification, bringing to the attention of NDTSS any actual or potential threat to its impartiality
- Apply a documented quality management system /audited/approved by NDTSS
- Have the resources and expertise necessary to establish, monitor and control examinations Centres, including examinations and the calibration and control of the equipment
- conduct qualification of candidates including review of application and decision on eligibility
- Prepare, supervise and administer examinations under the responsibility of an examiner authorised by NDTSS
- provide the certification body with the results of qualification needed to make a decision on certification by the certification body;
- Maintain appropriate qualification and examination records according to the requirements of NDTSS.

1.7.5 Examination centre responsibilities

Where established the examination centre shall:

Work under the control of NDTSS or authorised qualification body

An examination centre can be situated at an employer's premises. In this case, NDTSS shall require additional controls to preserve impartiality and the examinations shall be conducted only in the presence of, and under the control of, an authorised representative of the NDTSS.

1.7.6 Candidate responsibilities

Candidates, whether employed, self-employed or unemployed shall:

- Provide documentary evidence of satisfactory completion of a course of training
- Provide evidence of successful completion of an NDTSS examination/s
- Provide documentary evidence that the required experience has been gained under supervision
- Provide documentary evidence of vision satisfying the requirements of NDTSS.

1.7.7 Certificate holder's responsibilities

Certificate holders shall:

- Abide by a code of ethics published by the certification committee
- Undergo an annual test of visual acuity in accordance with 7.4 a), and submit the results of tests to the employer
- Notify the certification committee and the employer in the event that the conditions for validity of certification are not fulfilled.

2 LEVELS OF QUALIFICATION

2.1 LEVEL 1

An individual certified to SGNDT Level 1 has demonstrated competence to carry out NDT according to written instructions and under the supervision of Level 2 or Level 3 personnel. Within the scope of the competence defined on the NDTSS certificate, Level 1 personnel may be authorised by the employer to perform the following in accordance with NDT instructions:

- Set up NDT equipment
- Perform the tests
- Record and classify the results of the tests according to written criteria
- Report the results.

NDTSS certified Level 1 personnel shall neither be responsible for the choice of test method or technique to be used, nor for the interpretation of test results.

2.2 LEVEL 2

An individual certified to SGNDT NDT Level 2 has demonstrated competence to perform NDT according to NDT procedures. Within the scope of the competence defined on the NDTSS certificate, Level 2 personnel may be authorised by the employer to:

- Select the NDT technique for the testing method to be used
- Define the limitations of application of the testing method
- Translate NDT codes, standards, specifications, and procedures into NDT instructions adapted to the actual working conditions
- Set up and verify equipment settings
- Perform and supervise tests
- Interpret and evaluate results according to applicable standards, codes, specifications or procedures
- Carry out and supervise all tasks at or below Level 2
- Provide guidance for personnel at or below Level 2
- Report the results of NDT.

2.3 LEVEL 3

An individual certified to SGNDT NDT Level 3 has demonstrated competence to perform and direct NDT operations for which he is certified. SGNDT NDT Level 3 personnel have demonstrated:

- The competence to evaluate and interpret results in terms of existing standards, codes, and specifications
- Sufficient practical knowledge of applicable materials, fabrication, process, and product technology to select NDT methods, establish NDT techniques, and assist in establishing acceptance criteria where none are otherwise available
- A general familiarity with other NDT methods.

Within the scope of the competence defined on the NDTSS certificate, SGNDT NDT Level 3 personnel may be authorised to:

- Assume full responsibility for a test facility or examination centre and staff
- Establish, review for editorial and technical correctness, and validate NDT instructions and procedures
- Interpret standards, codes, specifications, and procedures

- Designate the particular test methods, procedures, and NDT instructions to be used
- Carry out and supervise all tasks at all levels
- Provide guidance for NDT personnel at all levels.

QUALIFICATION AND CERTIFICATION

2.4 NDT CERTIFICATIONS CURRENTLY AVAILABLE

Visual/Optical Testing (VT)

Level	Sector	Technique/Endorsements	Designator
1	Welds, Casting, Forgings, Industrial (s, a, r)	Direct	VT1PS / VTIS
2	Welds, Casting, Forgings, Industrial (s, a, r)	Direct, Indirect	VT2PS / VTIS
3	Welds, Casting, Forgings, Industrial (s, a, r)		VT3PS/VT3IS

Penetrant Testing (PT)

Level	Sector	Technique/Endorsements	Designator
1	Welds, Casting, Forgings, Industrial (s, a, r)	portable	PT1PS/PT1IS
2	Welds, Casting, Forgings, Industrial (s,a, r)	Portable, line system, visible, fluorescent	PT2PS/PT2IS
3	Welds, Casting, Forgings, Industrial (s, a, r)		PT3PS/PT3IS

Magnetic Testing (MT)

Level	Sector	Technique/Endorsements	Designator
1	Welds, Casting, Forgings, Industrial (s, a, r)	portable	MT1PS/MT1IS
2	Welds, Casting, Forgings, Industrial (s, a, r)	Portable, fixed units	MT2PS/MT2IS
3	Welds, Casting, Forgings, Industrial (s, a, r)		MT3PS/MT3IS

Radiography Testing (RT)

Level	Sector	Technique/Endorsements	Designator
1	Welds, Castings, Industrial (s, a, r)	Film	RT1PS/RT1IS
2	Welds, Casting, Industrial (s, a, r)	Gamma, X (Film, CR/DR), Limited-RTFI	RT2PS/RT2IS
3	Welds, Casting, Industrial (s, ,a, r)	Film, CR, DR	RT3PS/RT3IS/RT3-C/D

Eddy Current

Level	Sector	Technique/Endorsements	Designator
1	Welds	Portable	ET1PS
2	Welds, Tubes, Industrial (s, a, r)	Portable, Multichannel, Array	ET2PS/ET2IS
3	Welds, Tubes, Industrial (s, a, r)	Array	ET3PS/ET3IS / ET3A

Thermography

Level	Sector	Technique/Endorsements	Designator
1	Civil, Mechanical, Electrical	Passive	TT1PS
2	Civil, Mechanical, Electrical, Industrial (s, a, r)	Passive /Active	TT2PS/TT2IS/TT2A
3	Civil, Mechanical, Electrical, Industrial (s, a, r)		TT3PS/TT3IS / TT3A

Ultrasonics

Level	Sector	Technique/Endorsements	Designator
1	Welds, Castings, Forging, Industrial (s, a, r)	Plate	UT1PS/UT1GS
2	Welds, Castings, Forging, Industrial (s, a, r)	Plate, Pipe, T, Node, Nozzle (Only for Weld), Limited – UTT, UTL	UT2PS/UT2IS/UT2PA/UT2 TOFD
3	Welds, Castings, Forging, Industrial (s, a, r)		UT3C /UT3F

Phased Array Ultrasonics

Level	Sector	Technique/Endorsements	Designator
2	Weld / Industrial (s, a, r)		PAUT2W/PAUT2IS
3	Weld /Industrial (s, a, r)		PAUT3W/PAUT3IS

Time of Flight Diffraction Ultrasonics

Level	Sector	Technique/Endorsements	Designator
2	Welds		TOFD2W
3	Welds		TOFD3W

Note 1: Candidates wishing to apply for level 3 certification must have appropriate training and experience and would normally be expected to have held level 2 certification, in the specific method, for at least 12 months before being accepted to apply for level 3 certification. P Refers – Pre & Inservice Testing, A - Aerospace

Note 2: NDTSS certification for PAUT and TOFD is only applicable to candidates having successfully completed the training and examinations via AQB's offering this service. Please refer to the NDTSS web site. Additionally, the candidate must already have a UT Level 2 (conventional test) certification to be eligible for PA or TOFD training.

Note 3: NDTSS Certification for Computerised and Digital Radiography (CR/DR) is only applicable to candidates having successfully completed the training and examinations via AQB's offering this service. Please refer to the NDTSS web site for details. Additionally, the candidate must already have a conventional RT Level 2 certification to be eligible for CR/DR training.

2.5 LIMITED NDT QUALIFICATION UNDER ISO 20807

The NDTSS offers certificates for limited qualification under ISO 20807 to persons who perform NDT applications of a limited, repetitive or automated nature in the following applications:

Method	Abbreviations
Tank bottom testing	TBT (incorporating magnetic flux leakage testing)
Ultrasonic corrosion mapping	UTC

2.6 HEAT TREATMENT CERTIFICATION

The NDTSS will offer an in-house qualification for heat treatment of welds in steel using electrical resistance equipment based on the requirements of ISO20807. The minimum theoretical training and required competence has been provided by industry and documented in NDTSS document HT-01. This document identifies the purpose of this scheme, its administration, structure and assessment criteria and is only being offered via NDTSS AQB's. For advice on which AQB's are offering this service please refer to the NDTSS web site.

2.7 CERTIFICATION REQUIREMENTS

The basic requirements for NDT certification, as specified in ISO 9712 and ISO 20807 are:-

a) Satisfactory vision.

b) Adequate training.

c) Adequate experience.

d) Satisfactory performance in written and practical examinations.

Note: Examination candidates whose first language is not English, or is medically diagnosed with dyslexia are eligible to pre-apply to the examination body for a 15 minutes' extension in examination time. Application for extension must be provided on application for examination.

For persons meeting the requirements of (a), (b), and (d) above, but lacking experience, the Committee offers Trainee status

Additionally, applicants must provide a passport size and quality photograph with applications for initial, renewal and recertification. The photograph can be provided electronically via e-mail to the office provided it is in jpeg form with high resolution.

VISION REQUIREMENTS

For all levels of certification, the applicant is required to produce documented evidence from an optometrist, or other competent person, of compliance with ISO9712 and ISO 20807 namely:

▪ Prior to certification, and annually thereafter, near vision acuity shall be verified to be in accordance with the requirements of ISO 18490 or shall permit reading a minimum of Jaeger number 1 or Times Roman N4.5 or equivalent letters at not less than 30 cm with one or both eyes, either corrected or uncorrected.

▪ Prior to certification, recertification or renewal, the candidate/certificate holder shall demonstrate that a colour vision test has been administered within the previous 5 calendar years.

▪ It is required that colour vision and/or grey scale perception be sufficient for the individual to be able to distinguish and differentiate between the colours or shades of grey used in the NDT methods/techniques concerned as specified by the employer.

- The colour vision test shall either confirm that the individual has acceptable colour vision without restriction or shall state any limitation(s) on colour perception.
- Where any limitation in colour perception exists, the employer shall confirm whether or not this condition results in any limitation(s) to method or application specific techniques.
- The Ishihara 24 plate test is an example of a suitable colour vision test.

Alternative vision test methods, no less stringent than the above, may be acceptable to the NDTSS provided a formal written test procedure is submitted with the application.

Near vision acuity testing, colour vision and/or grey scale perception verification(s) shall be administered by a licensed physician, nurse, ophthalmologist or optometrist; or by another trained professional who is approved and documented by Level 3 personnel acting on behalf of the employer.

Note: Company in-house vision test certificates will be accepted by NDTSS once the company test procedure has been provided to the CB for review and approval. This procedure must identify the company officer(s) responsible for the vision testing scheme and all in-house certificates must be signed by a responsible officer.

Subsequent to certification, visual acuity shall be tested annually. The responsibility for this rests with the certified person and/or employer.

2.8 NDT TRAINING

The applicant shall have successfully completed an approved program of training in the relevant NDT Method and Product/Industry Sector in accordance with the requirements of ISO 9712 or ISO 20807, and/or complying with the published national training modules for the particular NDT method and product/industry sector. The applicant is required to produce validated evidence of training completing the required training and reaching an acceptable level of comprehension of the training.

The training requirements for the relevant methods and levels of certification are given in ISO 9712 or ISO 20807 and are summarised in section 3.8 to 3.11.

The Committee may recognise training by public and private training providers who train in accordance with approved national NDT training modules or NDTSS approved training module descriptors (syllabi as listed in this guide) that comply with the training syllabi and training hours specified in ISO 9712 ISO 20807.

The NDTSS also recognises that formal training courses provided by technical colleges and AQB's in some capital cities are not always accessible to many candidates. The NDTSS will accept company "in house" training provided the training scheme is fully documented and submitted to the CB for review and acceptance. In such cases the company is expected to have appropriate equipment available for training purposes and to provide information on study time/hours, course notes used, syllabus followed, textbooks used and other relevant information. The company must also provide an examination at the completion of the training to demonstrate the candidate has achieved an acceptable level of comprehension (70% or greater pass mark would be considered acceptable). The company will provide each candidate who has successfully completed the training an in-house certificate of training signed by the officer responsible for the training scheme

Note: Due to the degree of complexity with the phased array and time of flight tip diffraction methods for ultrasonic testing, the NDTSS certification committee will only accept training certificates from AQB's as valid evidence of meeting the required standard and minimum content for training in these methods.

The possible reductions in training duration are as described hereafter, provided that, when several reductions are applicable, the total reduction does not exceed 50 % of the training duration. Any reduction requires acceptance by the NDTSS.

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;

▪ 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 by up to 50 %.

Note: The college or university study must be relevant to the NDT method (chemistry, mathematics or physics) and/or to the product or industry sector (chemistry, metallurgy, engineering, etc.).

2.9 INDUSTRIAL NDT EXPERIENCE

2.9.1 Level 1 and Level 2

The applicant is required to have had a period of experience relevant to the certification sought in addition to any experience gained during training courses, such as practical training time. The applicant is required to produce evidence of experience and to complete the "Record of NDT Experience" on the application form. The experience requirements for the relevant methods and levels of certification are given in ISO 9712 or ISO 20807 and are summarised in section 3.8 to 3.11.

2.9.2 Level 3

Level 3 responsibilities require knowledge beyond the technical scope of any specific NDT method. This broad knowledge may be acquired through a variety of combinations of education, training and experience. The table below details minimum experience for candidates who have successfully completed a technical school or at least two years of engineering or science study at an accredited college or university. If this is not the case, the duration has to be multiplied by a factor of 2.

2.9.3 Possible reductions

The possible reductions in duration of experience are as described hereafter, provided that, when several reductions are applicable, the total reduction does not exceed 50 % of the experience duration. Any reduction shall require acceptance by the NDTSS.

Experience reduction due to Qualification/Education

For Level 2 certification, work experience consists of time as a Level 1 & Level 2.No reduction in the period of experience based on educational attainment shall be allowed for Level 1 & Level 2. The level and quality of education possessed by the candidate should be considered for Level 3

Experience reduction due to scope of work, complementary and simultaneous experience.

- 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.
- 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.
- 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.
- A certified Level 1, 2 or 3 adding an additional method may be permitted a reduction of required experience of 25 % for that additional method.
- A certified Level 1, 2 or 3 individual changing sectors, adding another sector or technique for the same NDT method shall be required to gain additional experience of at least 25 % of the experience required in above table; and this shall never be less than 15 days in duration.

When the scope of certification sought is limited in application (i.e., thickness measurement or automated testing), experience duration may be reduced by up to 50 % but shall not be less than 15 days.

Up to 50 % of the industrial experience time may be achieved by a structured experience program (SEP). One day of attendance at the SEP may be equivalent to a maximum of five days industrial experience. The SEP shall include all typical tasks of the level, method and sector concerned. The additional intent is to gain specific product and technique knowledge. The SEP shall be approved in advance by the certification body and shall be available for audit by the certification body.

In addition to the above requirement for experience hours, candidates seeking Radiographic Testing, they shall hold a local regulatory certificate and approved to operate X-rays or Gamm Radiography equipment. RT Level 2 or Level 3 certification will be required to show evidence of having satisfactory experience in Radiographic Interpretation.

2.10 MINIMUM NDT TRAINING & EXPERIENCE – ISO 9712:2021

NDT Method	Level 1		Level 2		Level 3	
	Training (days)	Total Experience (days)	Training (days)	Total Experience (days) Direct Access	Training (days)	Total Experience (days) (Higher Education/Grammar School)
Eddy Current Testing (ET)	5	45	6	180	6	270/450
Magnetic Testing (MT)	3	15	2	60	4	180/240
Penetrant Testing (PT)	3	15	2	60	3	180/240
Radiographic Testing (RT-F)	5	45	10	180	5	270/450
Computerised/Digital Radiography (RT-D/RT-CT)	5	+15	5	+45	5	+70/150
Ultrasonic Testing (UT)	8	45	10	180	5	270/450
Phased Array (PAUT)	5	+15	5	+45	5	+70/150
TOFD	5	+15	5	+45	5	+70/150
Visual Testing (VT)	3	15	2	60	3	180/240
Thermographic Testing (TT)	5	45	6	180	5	270/450
One day duration is at least seven hours, which can be achieved on a single day or by accumulating hours. The maximum allowable hours in any one day is 12 hours. Experience in days is achieved by dividing the total accumulated hours by 7. Candidate for Level 3 (direct access) who doesn't have valid ISO 9712 Level 2 should have double the experience and approved only for higher education. If the experience record is issued in months, 20 workdays per month will be recognized.						

Note 1: Direct Access to Level 2 or Level 3 would require total training days including of Level 1, Level 2 as applicable.

Note 2: Experience at level 2 & 3 includes the number of days at Level 2 and Level 1.

Note 4: A prerequisite for Ultrasonic Testing Phased Array or Ultrasonic Testing TOFD Level 2 is Ultrasonic Testing level 2 (ISO9712). A prerequisite for Ultrasonic Testing Phased Array or Ultrasonic Testing TOFD Level 3 is Ultrasonic Testing level 3 (ISO9712).

Note 4: Training hour for Digital/CT is based on existing Film certification. Direct access is acceptable provided training hour shall follow 9712:2021 requirements.

2.11 MINIMUM TRAINING & EXPERIENCE FOR LIMITED APPLICATION –ISO 20807

NDT Application	Training	Experience
Ultrasonic corrosion mapping	40 hours	160 hours
Tank Bottom Testing (TBT)	40 hours	160 hours

2.12 PRE-REQUISITES FOR LIMITED APPLICATION QUALIFICATIONS TO ISO 20807

2.12.1 Tank Bottom Testing (TBT)

The applicant must have current AS3998/ISO9712 certification for ultrasonic testing level 2 or have AS4635/ISO20807 ultrasonic corrosion mapping certification.

This requirement is to ensure the operator of TBT equipment is also capable of proving up MFL indications produced from the test.

2.13 MINIMUM TRAINING & EXPERIENCE – HEAT TREATMENT – NDTSS HT-01

NDT Application	Training	Experience
Heat Treatment of Welds in Steel Using Electrical Resistance Equipment	40 hours	160 hours

Note: Applicants must provide a certificate of training from an AQB and a declaration from their employer attesting to the minimum experience required, to be considered for certification.

2.14 TRAINEE

An applicant who lacks the minimum experience requirement but has received the relevant training and has demonstrated competence by a pass in the prescribed examinations, may request to be granted “Trainee” status and have certification deferred. Once the NDTSS has received evidence from the applicant of additional experience and the minimum number of hours

has been satisfied, trainee status will be upgraded to full certification with an expiry date 5 years from the date they completed the practical examination.

Note: It is the responsibility of a trainee to inform the NDTSS of experience gained whilst holding that status.

Trainee status is valid for five (5) years from the date of success in the practical examination. Applicants who require more than two (2) years to accumulate the required experience hours will have to demonstrate to the applications committee they have not had a significant interruption, i.e. a period of twelve (12) months or more where they have not used that method, otherwise a re-sit of the practical will be required. If after five (5) years the trainee has not finalised their certification, the application will lapse, and they must apply for certification as a new applicant.

2.15 NDT MODULE DESCRIPTORS

Module Descriptors (syllabi) for NDT examinations are available on request from the NDTSS Certification Committee Secretariat.

2.16 ARRANGEMENTS FOR NDT EXAMINATIONS

Only applicants who have met the specified minimum requirements for approved training are eligible to sit examinations.

NDTSS presently conducts examinations at Approved Examination Centres (refer to the NDTSS website for list of AECs). Examination dates and examination closing dates are available from the NDTSS Certification Administrator (Certification@ndtss.org.sg).

Note: Examinations for Ultrasonic Testing – PA, TOFD, CR, DR, Radiographic Testing, Eddy Current and Heat Treatment of Welds in Steel Using Electrical Resistance Equipment can only be done via an AQB. Persons wishing to acquire either of these certifications should refer to the NDTSS web site or contact the relevant AQB office for advice on AQB's offering this service.

Practical examinations are normally held in conjunction with the written examinations but may (due to availability of test pieces and test equipment) require special arrangements. Applicants for Radiographic Testing should note that they are now required to produce one or more radiographs as part of the practical examination. Furthermore, applicants for Radiographic Testing may be required by NEA to held R1 or L5/L6 or local regulatory approval to operate Gamma projectors or X-ray devices associated with the organization and a personal radiation monitoring device at the examination centre.

Persons certificated to Level 2 or Level 3 in ultrasonic testing (UT) may obtain endorsements to the certification for complex geometries of T joints, nozzle joints and node joints. Persons seeking these endorsements must make application using the Application for Endorsement form and pass a practical examination (including a work instruction) for UT of the applicable geometry. The Application for Endorsement form is available from the NDTSS web site or by contacting the Certification Administrator.

In the case of a certificated level 2 or Level 3 person achieving nozzle or node endorsement, the candidate's certificate is validated to match the initial expiry date.

Note: Radiographic practical examination candidates may need to arrange a suitable AEC facility or their employer's premises using their equipment, to undertake the practical test. This may be necessary due to regulatory and/or OH&S issues affecting the AEC site.

Exams for Fixed equipment for MT or Line system for PT could be conducted at employers' facility. Calibration records of such equipment shall be kept with candidate record.

2.17 UNSCHEDULED EXAMINATIONS

Unscheduled examinations can be arranged for groups of applicants subject to a minimum charge dependent on costs to provide the service. It should be noted that the NDTSS, sometime in the future, intends to only offer examinations through AQBs. Ample notice will be provided to potential candidates before this process is implemented. The conditions for these examinations are available on request from the Certification Administrator.

2.18 RE-SIT EXAMINATIONS

A candidate who fails to obtain the pass grade for any examination part, may seek re-examination up to two times in the failed part(s), provided that the re-examination takes place not sooner than one month, unless further training acceptable to the certification committee is satisfactorily completed, nor later than two years after the original examination. Applicants who fail the second re-sit examination shall be required to sit all examinations as for a new candidate.

Applicants who fail examinations should download an application to Resit form from the NDTSS web site. This form must be completed and returned with the appropriate payment before the applicant can resit the failed examination(s). Payment comprises the appropriate Examination fee(s) as detailed in section 4. For resits taken at NDTSS examination centres, resit applications must be received prior to the examination date.

2.19 CERTIFICATION AND PERIOD OF VALIDITY

Successful applicants receive a certificate and an identification card.

Issue 1 Certifications are valid from the date of issue and up to five years from the date of successful completion of the practical exam.

Issue 2 Certifications are valid from the date of issue and up to five years from the date of successful renewal.

Recertification will be required after 10 years from the date the practical examination was successfully completed. To avoid penalising candidates who re-certify prior to expiry of their certificate, the recertification shall have a validity of five (5) years from expiry of current certification, up to a maximum of 6 months.

Example: A candidate's certification expires in January 2017. The candidate re-certifies in September 2016. The validity of the certificate will be dated from the initial expiry date of January 2017.

One passport photograph is required to be supplied by the applicant for entry to examinations and for use on the identification cards and for NDTSS records.

2.20 RENEWAL OF CERTIFICATION

Prior to the completion of the period of 5-year validity following certification and recertification, certification shall be renewed by the certification body for a new period of validity on production of:

a) documentary evidence of a satisfactory near vision acuity examination taken within the preceding 12 months; and

b) documentary evidence of a satisfactory colour vision and/or grey scale perception examination taken within the preceding 60 months; and

c) verifiable documentary evidence of continued satisfactory work activity without significant interruption in the method and sector for which certificate renewal is sought.

and either:

d) successful completion of a practical examination element in accordance with except that it shall consist of a minimum of 1 examination specimens required per sector **or**

e) successfully meeting the requirements of the structured credit system as given in Table C1.

If the criterion c) for renewal is not met, the individual shall complete the practical examination elements.

Where a candidate elects to use the structured credit system, they shall provide evidence to the certification body to demonstrate achievement of a minimum of 100 points in the 5 year renewal period based on the requirements of Table.

For candidates seeking renewal of Level 1 certificates, a minimum of 75 of the 100 points is required for any combination of activities listed in part A of Table C1.

For candidates seeking renewal of Level 2 or 3 certificates, a minimum of 50 of the 100 points is required for any combination of activities listed in part A of Table C1.

Where a candidate is seeking renewal for more than one certificate, points granted for a specific activity can be applied to the total points required for each certificate for those activities not specific to a particular method (e.g., “Current individual membership in NDT or NDT related society”). However, candidates shall meet the total number of points required (i.e., 100 points) for each certificate for which renewal is being sought.

Application for renewal may be submitted up to 6 months prior to the expiry date of the current certification. Expiry date of the renewed certificate will be 5 years from the expiry date of the initial certification period.

Should the renewal process be completed after the expiry date of the existing certificate; the certificate shall be issued on the date that the renewal formalities were completed. The expiry

date will still be 10 Years from the date of the initial successful practical exam. This late renewal will leave the candidate with a period of non-certification between expiry and renewal.

2.21 RECERTIFICATION

Applications for recertification may be conducted up to 6 months prior to the expiry date of the current certification. Expiry date of the recertified certificate will be 5 years from the expiry date of the renewal certification period. That is 15 Years from the date of the initial successful practical exam.
Should the recertification formalities be completed after the expiry date of the existing certificate; the recertification certificate shall be issued on the date that the recertification formalities were completed. (This would effectively be the date all required information and moneys were received at the NDTSS office. Uploading and approval if after this date, will not impact on the issue date of the certificate.) The expiry date will then be 5 Years from the date of the successful recertification practical exam. This will leave the candidate with a period of non-certification between expiry and recertification.

Prior to the expiry of the second 5-year period (i.e. 10 years from successful practical examination), persons are required to recertify for a further period of five years.

Having met the visual acuity requirements taken within the preceding 12 months

For ISO 9712 NDT level 1 and 2 and ISO 20807 Limited NDT Certifications:

Recertification will be achieved by completing a practical examination (which includes a written test procedure) in accordance with the relevant standard with a pass mark of 70%.

For heat treatment to NDTSS HT-01 recertification will be achieved by completing a practical examination (which includes the competencies covered by HT-01) with a pass mark of 80%.

2.21.1 ISO 9712 NDT Level 3 recertification:

- Level 3 certificate holders seeking recertification shall provide a confirmation issued by the employer of continued satisfactory work activity without significant interruption in the method and sector for which recertification is sought and

a) satisfy the Level 3 requirements of a written examination as detailed below: or

b) meet the requirements for a structured credit system, as given in Table C1.

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

In both cases (written examination or credit system), the individual shall either provide appropriate documented evidence, acceptable to NDTSS, of their continued practical competence in the method or pass a Level 2 practical examination, as specified in practical level 2 requirements, except for the drafting of NDT instructions.

Where a certificate holder elects to use the structured credit system, they shall provide evidence to the certification body to demonstrate achievement of a minimum of 100 points in the 5 year recertification period based on the requirements of Table C1

For certificate holders seeking recertification of Level 3 certification:

— a minimum of 50 and a maximum of 70 of the 100 points is required for any combination of activities listed in item A of Table C1 and

— a minimum of 30 and a maximum of 50 of the 100 points is required for any combination of activities listed in item B of Table C1.

Where a certificate holder elects to take the written examination or does not meet the structured credit system requirements, they shall successfully complete an examination that includes:

- Satisfactory complete a theory examination with minimum of 20 multiple-choice 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
- Satisfactory complete a theory examination with minimum of 10 multiple-choice questions on the requirements of the certification body's certification scheme.

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, unless otherwise extended by the certification body

In the event of failure in the two allowable re-examinations, the certificate shall be withdrawn.

In order to reinstate certification, a candidate shall:

— complete further training, acceptable to the certification body; and

— retake all main method examination items as required for initial certification.

The date of expiration of the reinstated certificate shall be no more than 5 years from the date of expiration of the original certificate.

A candidate who applies for and does not meet the requirements of the credit system shall be recertified by examination. 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.

STRUCTURED CREDIT SYSTEM FOR LEVEL 2/ LEVEL 3 RENEWAL & RECERTIFICATION

Table C.1 — Structured credit system for renewal Level 1, 2 and 3 and for Level 3 recertification [a]

		Level 1			Level 2			Level 3		
Item	Activity	Points granted per activity	Maximum number of points per year of activity	Maximum number of points over 5 years of activity	Points granted per activity	Maximum number of points per year of activity	Maximum number of points over 5 years of activity	Points granted per activity	Maximum number of points per year of activity	Maximum number of points over 5 years of activity
	Part A									
1	Performance of NDT Activities [a]	2 / day	25	95	2 / day	25	95	2 / day	25	95
2	Completion of theoretical training in the method	1 / day	5	15	1 / day	5	15	1 / day	5	15
3	Completion of practical training in the method	2 / day	10	25	2 / day	10	25	2 / day	10	25
4	Delivery of practical or theoretical training in NDT in the method considered	N/A	N/A	N/A	1 / day	15	75	1 / day	15	75
5	Participation in research activities in NDT field or for engineering of NDT (see Annex E)	1 / week	15	60	1 / week	15	60	1 / week	15	60
	Part B									
6	Participation to a technical seminar/paper in the field of the method or technique	1 / day	2	10	1 / day	2	10	1 / day	2	10
7	Presenting a technical seminar/ paper in the field of the method or technique	1 / presentation	3	15	1 / presentation	3	15	1 / presentation	3	15
8	Current individual membership in NDT or NDT related society	1 / membership	2	5	1 / membership	2	5	1 / membership	2	5
9	Technical oversight and mentoring of NDT personnel/ trainee in the relevant method	N/A	N/A	N/A	2 / mentee	10	30	2 / mentee	10	40
10	Participation or convenorship in standardization and technical committees	N/A	N/A	N/A	1 / committee	3	15	1 / committee	4	20

NOTE Where the term "year(s)" is noted in this table, this is specified as a certification year and not as a calendar year.

[a] See C.2 for specific details of this activity.

		Level 1			Level 2			Level 3		
Item	Activity	Points granted per activity	Maximum number of points per year of activity	Maximum number of points over 5 years of activity	Points granted per activity	Maximum number of points per year of activity	Maximum number of points over 5 years of activity	Points granted per activity	Maximum number of points per year of activity	Maximum number of points over 5 years of activity
11	Performing a technical NDT role within a certification body	N/A	N/A	N/A	2 / activity	10	30	2 / activity	10	40

NOTE Where the term "year(s)" is noted in this table, this is specified as a certification year and not as a calendar year.

[a] See C.2 for specific details of this activity.

Persons who are in their first 5 years after successful completion of the practical exam or after re-certification are issued with an Issue 1 certificate.

Persons who are on their second 5 years after initial certification or recertification are issued with an Issue 2 certificate. Further renewals and recertification are available at 5- and 10-year intervals under the same conditions as the initial renewal and recertification.

Persons, who hold a node / nozzle endorsement for ultrasonic testing level 2 welds, will be required to examine a nozzle / node test piece only.

2.21.2 Lapsed Qualifications/Certifications

All effort will be made by NDTSS to give adequate fore warning that a certificate is due to expire. **The onus of maintaining certification belongs to the person identified on the certificate**, who should begin renewal or recertification procedures at a suitable time before expiry.

Note: The authority to operate is given by the employer, and if a certificate expires then the employer may disallow continued employment. If an operator continues to work with an invalid certificate without informing his employer or client, then all responsibility remains with the operator.

If renewal is applied for after expiry and up to 12 months from this date, then a late renewal fee shall apply. If the operator fails to renew after 12 months, then the certificate shall lapse and can only be regained by meeting the requirements for initial certification examination.

If recertification is applied for after expiry and up to 12 months from this date, then a late renewal fee shall apply. If recertification is applied for more than 12 months after expiry (i.e. lapsed), then it can only be regained by applying for certification as an initial certification examination.

Note: Renewal or recertification issued after expiry but before lapsing will commence from the date of approval only, resulting in a certification period that is less than, but not exceeding the 5- or 10-year total allowed by the standard.

2.22 CHANGING FROM ISO9712 AEROSPACE TO ENGINEERING SECTORS

Persons wishing to gain certification in an engineering sector (Welds, Castings, Wrought or Pre & Inservice Inspection) and who hold ISO9712 certification for the Aerospace sector from other certification body must complete the following examinations:

- the relevant Practical Examination
- the relevant Specific Examinations.

Please note that industry experience requirements must also be met.

2.23 GENERAL EXAMINATION ONLY (AEROSPACE)

Persons seeking aerospace Registration under EN4179 or other standards who wish to sit for one or more NDTSS L2 or L3 Examinations without applying for certification, may do so by:-

- Completing a “Application for Additional Examination(s)” form, available from the NDTSS Certification Administrator or from the Society’s web site.
- Paying the appropriate examination fee plus an administration fee. Information on these fees is published in the NDTSS’s SCHEDULE OF FEES - NDT. Applicants should ensure they have a current version of the Schedule of Fees.
- Enclosing one passport photograph for identification purposes at the examination.

Applicants should note that completing the main method examination successfully does not

qualify them for any form of NDTSS Certification. No certificate will be issued to these applicants. However, these persons will be granted exemption from the Main Method Examination in any future application for certification in accordance with ISO 9712 or EN4179 managed by NDTSS/NANDTB.

2.24 RECERTIFICATION FROM ISO 9712 WELDS TO INDUSTRIAL

Persons holding existing Level 2 or 3 NDTSS Certification in welds and seeking recertification, the requirement is to recertify to industry and are required to perform the industrial sector practical examinations and industrial sector specific examination.

3 FEES

3.1 APPLICATION FORMS

Application forms, together with notes for guidance, are obtainable from the NDTSS Certification Administrator, or can be downloaded from the Society's web site – www.NDTSS.org/cb forms.

It should be noted that all applications must be accompanied by all relevant information and the application and examination fees as listed in the SCHEDULE OF FEES-NDT (latest edition).

Note: Incomplete applications will not be processed.

3.2 APPLICATION FEES

An application for certification fee is payable with **every** application to offset administration costs, certificate and I.D. card production.

Current application fees are published in the NDTSS "SCHEDULE OF FEES – NDT" and are available from the NDTSS website www.NDTSS.org.sg which could be downloaded from the link https://ndtss.org.sg/wp-content/uploads/2017/01/Certification-Fees-2019.pdf.

Applicants should ensure that they have the latest up-to-date schedule of fees for the current year before submitting their Application.

An application is valid for a period of two years. After that time, the application will be considered to have lapsed. Extensions to the two-year validity period may be considered in special circumstances.

3.3 EXAMINATION FEES

An examination fee is payable for every examination to offset preparation, marking, test piece freight and exam supervision costs.

Current examination fees are published in the SCHEDULE OF FEES – NDT. Applicants should ensure that they have the latest up-to-date schedule for the current year before submitting their application.

3.4 RENEWAL / RECERTIFICATION FEES

Current renewal and recertification fees are published in the SCHEDULE OF FEES-NDT. Applicants should ensure that they have the latest up-to-date schedule for the current year before submitting their application for renewal or recertification.

Note 1: For renewal of certification, the renewal fee only is payable. An "*Application for Renewal*" form must be completed.

Note 2: For recertification, i.e. on expiry of an issue 2 certificate, the recertification including the practical examination fees are payable. The "*Application for Re-certification*" form must be completed.

Note 3: If practical examinations are completed through an AQB then only the recertification fee (without practical examination) is payable to NDTSS.

Note 4: Level 3 recertification can be achieved by either undertaking a practical and written examination, or through a credit point system which includes a practical examination, in accordance with ISO9712 annex C.

3.5 NON-ATTENDANCE AT EXAMINATIONS

Applicants applying for an examination may request, in writing, a deferral of the examination up to 30 days before the examination date.

Where no deferral is requested and the applicant fails to sit the examination as planned, that part or the entire examination fee shall be forfeited, as detailed in Clause 3.8 and the application will lapse.

3.6 CODE OF ETHICS

All applicants for NDT examinations are required to agree to be bound by the NDTSS Code of Ethics and Regulations for Use of Certificates and Logos/Marks a copy of which is provided with the Committee's *Application for Certification Forms.* The Code of Ethics is found on www.ndtss.org

3.7 REPLACEMENT CERTIFICATES AND ID CARDS FEES

Persons requiring replacement of lost Certificates or I.D. cards should make application to the Certification Administrator using the *Application for Replacement Certificate/ID Card* that is available on the NDTSS web site. Fees for the issue of replacement Certificates and I.D. Cards are published in the Schedule of Fees-NDT.

3.8 REFUND POLICY

In addition to the above fee structure, NDTSS has a refund policy for cancellations and deferrals:

3.8.1 Cancellation

Application Fee: for initial certification, renewal or recertification **Non-refundable**

Application for Examination Fees: Cancelled prior to 2 weeks before the examination date **50% refundable**

Application for Examination Fees: Cancelled less than 2 weeks before the examination date **Non-refundable**

3.8.2 Notified Deferral

Application for Examination Fees: Notified prior to 30 days before the examination date **Credited to next exam date.**

Note: If the applicant fails to notify deferral, clause 4.8.1 applies

4 NDT EXAMINATIONS

4.1 REQUIREMENTS FOR ISO 9712 - LEVEL 1

Examination requirements for Level 1 certification comprise:

- General Examination
- Specific Examination
- Practical Examination

4.1.1 General Examination Level 1

This examination tests the applicant's knowledge of the theory and general applications of the NDT method. This paper consists of multiple-choice questions to be answered on the examination paper.

UT/RT/ET/: 40 questions minimum

MT/PT/VT: 40 questions minimum

Duration: 80 minutes maximum

Pass Mark: 70%

4.1.2 Specific Examination Level 1

This examination tests the applicant's knowledge of the Industrial Sector and the application of the NDT method to the specific field of non-destructive testing (product sector). The paper consists of multiple choice and/or short answer questions to be answered on the examination paper.

UT/RT/ET/MT/PT/VT: 20 questions minimum

Duration: 40 minutes maximum

Pass Mark: 70%

4.1.3 Practical Examination Level 1

This examination requires the practical application of the NDT method to the Industry Sector for which application is made. The Practical Examination may include any or all (but is not limited to) of the following requirements:

- Detailed description and illustration of the equipment set-up and/or test procedure and test

parameters for a particular application.

▪ The recognition and identification of discontinuities as shown by the test, and which includes general knowledge of the mechanism giving rise to the discontinuities.

▪ Accurate reporting concerning geometry, location and sizing revealed by the test procedure.

Duration:

UT/RT/: 2 hours per specimen maximum

MT/PT/VT/ET: 2 hours per specimen maximum

RTFI / IR: 15minutes per radiograph or thermogram

A minimum pass mark of 70% is required in each sample.

Applicants who fail to report discontinuities nominated for mandatory detection will not be granted a pass in the practical examination.

4.2 REQUIREMENTS FOR ISO 9712 - LEVEL 2

Examination requirements for Level 2 certification comprise:

- General Examination
- Specific Examination
- Practical Examination

4.2.1 General Examination Level 2

This examination tests the applicant's knowledge of the theory and general applications of the particular NDT method. This paper consists of multiple choice and/or short answer questions to be answered on the examination paper. There is no general examination for PAUT & TOFD examination.

UT/RT/ET/MT/PT/VT/TT: 40 questions minimum

Duration: 80 minutes maximum

Pass Mark: 70%

4.2.2 Specific Examination Level 2

This examination tests the applicant's knowledge of the Industrial Sector and the application of the NDT method to the specific field of non-destructive testing (product sector or Industrial sector). The paper consists of multiple-choice questions to be answered on the examination paper. Examination references such as standards, specifications, table(s) would be provided for reference to answer applicable specific questions

UT/RT/ET/MT/PT/VT/TT: 20 questions minimum for product sector and 30 questions for industrial sector

Duration: 60 minutes for Product sector and 90 minutes for Industrial sector

Pass Mark: 70%

4.2.3 Practical Examination (Practical Task & Instructional Element) Level 2

This examination requires the practical application of the NDT method to the Industry Sector for which application is made. The Practical Examination may include any or all (but is not limited to) of the following requirements:

- Detailed description and illustration of the equipment set-up and/or test procedure and test parameters for a particular application.
- Interpretation of radiographs, where applicable.
- The recognition and identification of discontinuities as shown by the test, and which includes general knowledge of the mechanism giving rise to the discontinuities.
- Accurate reporting concerning geometry, location and sizing revealed by the test procedure.
- Writing of an instruction in the NDT method and product/industry sector for a Level 1 operator, this will be graded separately from conducting the test.

The minimum pass mark for the practical element & Instruction element is 70% in each sample tested, image interpreted and work instruction.

Duration:

UT/RT/ET/: 3 hours maximum per specimen including report writing

MT/PT/VT: 2 hours maximum per specimen including report writing

Instruction writing – 1 hour, Equipment Calibration & set up-1 hour (Maximum 2 hours for preparation)

RTFI – 15 minutes per radiograph (maximum of 2.5 hours for interpretation)

Practical examinations are broken into sections.

Example: Radiography practical exam consists of 3 sections.

a) Inspection and reporting of minimum 2 samples
b) Development of Work Instruction
c) Interpretation of 10 Radiographs

A minimum pass mark of 70% is required in each sample and section.

Applicants who fail to report discontinuities nominated for mandatory detection will not be granted a pass in the practical examination.

Applicants who fail to comply with specific code compliance areas will not be granted a pass in the practical examination. Examples include failure to comply with:

- Geometric Un-sharpness (RT)
- Minimum reporting requirements (all methods)

- Scanning techniques and coverage (UT)

A person failing practical examination of a particular section need only re-sit examination of that failed section.

Example: For radiography, where a candidate might achieve 75% in Sample1, 60% In samples 2, 80% in work instruction and 75% In interpretation. The overall result is a FAIL. With the candidate require to re-sit the samples section (inspection and reporting of all samples)

4.2.4 Advanced Techniques

The specific requirements for level 2 practical examination for the nominated advanced techniques are as follows:

4.2.4.1 Phased Array (PAUT) – Industrial Sector

Exam Samples: 1 off corroded sample or rolled plate sample, 2 off welds

Encoded Phased Array Collection Corrosion

- Assembly and calibration of Ultrasonic Phased Array equipment. (1 hours)

NOTE. The student will be required to carry out a full calibration without the use of previously saved setup files. If this part of the examination is satisfactory the candidate may proceed to the remainder, if not the examination will be discontinued.

- **Inspection of corrosion sample or rolled plate sample.**

The student will analyse the data on the instrument or on external device (laptop), and provide a report displaying the results in an indicated format and showing the location and size of discontinuities present in the sample. The report shall contain information such as defect no, characterization, size and position from known datum's. The report shall also contain, phased array images of all data collected and each discontinuity.
(Maximum 2 hour)

Encoded Phased Array Collection Welds

- Assembly and calibration of Ultrasonic Phased Array equipment. (2 hours)

NOTE. The student will be required to carry out a full calibration without the use of previously saved setup files. If this part of the examination is satisfactory the candidate may proceed to the remainder, if not the examination will be discontinued.

- **Inspection of two off samples as selected by the examiner, comprising a combination of Plate, Pipe or Tee.**

The student will analyse the data on the instrument or on external device (laptop), and provide a report displaying the results in an indicated format and showing the location and size of discontinuities present in the sample. The report shall contain information such as defect no, characterization, size and position from known datum. The report shall also contain, phased array images of all data collected and each discontinuity.
(Maximum 2 hour each specimen.)

The minimum pass mark for the practical part is 70% overall, and 70% for each sample tested. (Failure to detect and report a reportable discontinuity in any one sample will result in failure of this examination part).

4.2.4.2 TOFD

▪ Calibrate, test, collect, store and analyse test data for two linear weld samples selected by the Examiner. Time allowed: 1 hr for calibration and 2 hrs per specimen including data interpretation.

▪ Interpret and report on the recorded weld scan data files representative of a range of TOFD examinations. Display the results in an indicated format, showing the location and size of flaws present in the weld.

▪ Prepare a detailed NDT instruction suitable for level 1 certificate holders to follow for testing of one linear butt weld sample to a provided code, standard or specification. Time allowed: one hour.

4.2.4.3 Computed Radiography / Digital Radiography (CR/DR)

▪ The radiographic testing of 2 specimens, selected by the examiner as appropriate to the certification sought in accordance with instructions provided. (Maximum time: 2 hours per specimen)

▪ Preparation of a detailed NDT Instruction to a provided code, specification or standard for one specimen. (Maximum time available 1 hour)

▪ Viewing, interpreting and reporting on a total of 10 images representative of the categories of certification sought. (Maximum Time 2.5 Hour)

4.2.5 Examination Exemptions –ISO 9712 - Level 1 and 2

Exemption from the Level 1 and 2 General Examination is available to:

▪ Applicants who have passed an equivalent examination in the relevant method, either conducted by NDTSS or other ISO9712 recognised certification committee,

▪ Applicants who have passed the General Examination in a particular NDT method as part of a qualification for the particular product sector and are seeking certification in the same method in another product sector.

▪ If applicant passes the phased array UT level 2 then success at the practical weld examination can be used as evidence for re-certification of the UT level 2 (welds) qualification. The clock is re-set based on when the phased array practical examination was sat.

Applicants holding overseas certifications may also be eligible for exemptions. (Ref Overseas Qualifications Section 6.0)

4.3 REQUIREMENTS FOR ISO 9712 - LEVEL 3

All candidates for Level 3 certification in any NDT method shall have successfully completed (with a grade of ≥70 %) the practical examination for Level 2 in the relevant sector and method, except for the drafting of NDT instructions for Level 1. A candidate who is Level 2 in the same NDT method and product sector or who has successfully passed a Level 2 practical examination for the NDT method in an industrial sector is exempt from passing again the Level 2 practical examination. This exemption is only valid for the product sectors covered by the industrial sector concerned and, in any other circumstances; the relevant sector is the sector in which the candidate seeks Level 3 certification.

4.3.1 Basic Examination Level 3

This written examination shall assess the candidate's knowledge of the basic subjects using at least the number of multiple-choice questions shown below.

Part	Subject	Number of questions
A	Technical knowledge in materials science and process technology.	25
B	Knowledge of the certification committee's qualification and certification system based on this International Standard. This may be an open book examination.	10
C	General knowledge of at least four methods as required for Level 2 and chosen by the candidate from the methods given in Clause 1. These four methods shall include at least one volumetric method (UT or RT).	15 for each test method (total 60)

It is recommended that the basic examination be passed first and remain valid, provided that the first main method examination is passed within five years after passing the basic examination. A candidate holding a valid ISO9712 Level 3 certificate is exempt from the need to retake the basic examination.

Papers will consist of multiple choice and/or short answer questions to be answered on the examination paper.

Duration: 50 minutes for Part A, 30 minutes for Part B, 2 hrs for Part C

Pass Mark: 70% in each of the above three (3) parts

4.3.2 Main Method Examination Level 3

This examination will test the applicant's in-depth knowledge of the theory and general applications of the particular NDT method in the product/industry sector.

The applicant will also be required to draft one or more NDT test procedures in the relevant product/industry sector.

Part	Subject	Number of questions
D	Level 3 knowledge relating to the test method applied.	30
E	Application of the NDT method in the sector concerned, including the applicable codes, standards, specifications and procedures. This may be an open book examination in relation to codes, standards, specifications and procedures.	20
F	Drafting of one or more NDT procedures in the relevant sector. The applicable codes, standards, specifications and other procedures shall be available to the candidate. For a candidate who has already drafted a NDT procedure in a successfully passed Level 3 examination, the certification committee may replace the drafting of a procedure with the critical analysis of an existing NDT procedure covering the relevant method and sector, and containing errors and/or omissions.	—

The paper will consist of 30 multiple choice questions covering the test method and 20 multiple choice questions in the industry sector plus one or more NDT procedure writing exercises.

Duration: Part D 1 Hour maximum, Part E 1 Hour maximum, Part F 5 hours maximum.

Pass Mark: 70% in **EACH** of the above three (3) parts

4.3.3 Practical Examination Level 3

Applicants at level 3 must have satisfactorily completed the ISO 9712 level 2 practical examination within the previous 10 years in the NDT method and industry sector for which he/she is seeking level 3 certification.

A person failing practical examination of a particular section need only re-sit examination of that failed section.

Note: All applicants granted level 3 certification must re-sit the practical examination at the completion of 10 years from the previous practical examination. For example, if a candidate with a level 2 certificate in year 3 of issue 2, i.e. in year 8 from the last practical examination, applies for level 3 and is successful then he/she must re-sit a practical examination after another 2 years. In this case the level 3 certificate provided will be at issue 2 with a 2 year expiry date. This rule is to ensure candidates upgrading to level 3 cannot potentially practice for 19 years without re-sitting a practical examination.

4.3.4 Examination Exemptions –ISO 9712 - Level 3

A certified level 3 individual changing sectors, or adding another sector in the same NDT method, need not retake the basic examination or the level 3 knowledge relating to the test method of the main-method examination.

Applicants seeking Level 3 certification in more than one NDT method are exempted the Basic Examination provided it has been satisfactorily passed at the first Level 3 Application, and provided that the first Main Method Examination is passed within five (5) years of passing the

Basic Examination.

4.3.5 Limited NDT Qualification - Requirements for ISO 20807

Examinations under ISO 20807 comprise two examinations:

- A General Examination covering the particular NDT method and application of that method in the particular application.
- A practical examination to assess competence.

4.3.6 Heat Treatment of Welds in Steel Using Electrical Resistance Equipment – NDTSS HT-01

- A General Examination of 2 hours duration consisting of multi choice and short answer questions.
- A practical examination of 4 hours duration on electrical weld heat treatment set-up and instrument recording.

4.3.7 Candidate Requirements for examinations

At the examination, the candidate shall have in his possession valid proof of identification and an official notification of the examination, which shall be shown to the examiner or invigilator upon demand.

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

Candidates shall not be permitted to bring into the examination area personal items, unless specifically authorised to do so by the examiner.

5 INTERNATIONAL QUALIFICATIONS

This Section deals with policy and actions by the NDTSS to process applications from persons applying for ISO 9712 certification, or ISO 20807 qualification, who hold NDT certifications not granted by NDTSS.

NDTSS will recognize all AINDT certifications for the applicable sector without any additional examinations.

The NDTSS is signatory to a Multilateral Recognition Agreement with the ICNDT. Persons with certification from an ICNDT signatory certification scheme will be able to be recertified to the SGNDT ISO9712 certification from NDTSS provided the evidence of examinations were held in the origin country of the certification body (E.g PCN from UK or DGzfp from Germany) or examinations held in Singapore or where NDTSS authorized exam centre is available. The NDTSS reserves the right to require persons seeking certification in Singapore to undertake additional examinations (e.g., Suspended Examination centres).

The validity of the ISO9712 certification granted on transfer from an NDTSS recognised Certification scheme will be the same as the expiry date of the current overseas certification. For example, the ISO9712 certification granted for a BINDT PCN certification obtained by taking examination held in UK or from an approved examination centre in Singapore expiring in, say,

October 2020 would also expire in October 2020. At that time the ISO9712 certification is subject to the procedure for 'Renewal or 'Recertification', depending upon whether the international certification is an Issue 1 or Issue 2.

5.1 APPRAISAL OF QUALIFICATIONS AND EXPERIENCE

Applications for a particular method should be accompanied by:

- Certified copies of ISO9712 certificates and other documentation on training and examinations, required.
- Resume of work experience.

As a guide to applicants with international qualifications who are seeking recognition of the qualifications, the NDTSS will only consider these qualifications where the qualification scheme, under which they were issued, complies with the requirements of ISO 9712 from a Certifying Body endorsed as complying with ISO 17024 & be part of ICNDT/EFNDT MRA Schedule. In addition to the usual application form, applicants in such instances are expected to provide certified documentary evidence (in English) showing compliance with these standards to enable the NDTSS to make the necessary evaluation.

Applicants wishing to transfer to the NDTSS certification scheme, who hold overseas qualifications recognised by NDTSS which are issued within non-English-speaking countries, must be accompanied by evidence of an IELTS Band Score of 6.0.

A valid ISO 9712 Level 1 / 2 /3 by a certification body accredited to ISO 17024 & examination held by an AQB/ Examination Centre operating from Singapore for the relevant method and sector may be waived for all examinations in that sector & method & level. Candidates certified other than by AINDT might be required to do practical examination for 1 specimen in each sector at the discretion of Certification committee in order to recognize such certification (e.g., Examination held through an AQB outside Singapore or Certification obtained from a Certification body where the examination is held away from the host country). Failure to pass practical examination shall follow the requirements of initial examination.

5.2 PERSONAL INTERVIEW

At the discretion of the NDTSS Certification Committee, applicants may be subjected to a personal interview to cover issues do not clear from the written application.

6 SPECIAL ARRANGEMENTS

6.1 MULTILATERAL RECOGNITION AGREEMENT WITH ICNDT/EFNDT

The Society is signatory to a Multilateral Recognition Agreement with the ICNDT, for recognition of certification of persons by the signatory certification bodies operating a 3rd party certification programme in accordance with ISO17024 and providing certification to ISO 9712. The NDTSS procedure for recognition of personnel from overseas is defined in the relevant section of this Guide. Details of the agreement are available on the NDTSS Society's web site.

Certified Level 3 from ICNDT MRA Schedule 2 Certification Bodies and ASNT NDT Level 3 with ISO 9712 Level 2 Obtained from MRA Schedule 2 Certification bodies in the method concerned satisfies the requirements to be as a SGNDT Level 3 examiner until December 2025. For Thermal Infrared & Leak Testing ASNT Level 3 satisfies the requirement of an examiner.

AWS –CAWI (Associate) / CSWIP 3.0 visual inspectors will be exempted from practical examinations for Visual Examination – Welded Products (Level 1).

AWS CWI (Welding Inspector) / CSWIP 3.1 Welding Inspectors are exempted for their practical examination for visual Examination– Welded Products (Level 2) except of instruction writing to the given standard

Candidates holding valid ASNT/ACCP Level III are exempted from Part A & Part C of Basic examination

Candidates holding valid ASNT/ACCP Level III in particular method are exempted from Part D Method examination

If any candidate elects to claim an exemption to which he or she is entitled, the mark obtained in the examination, which lead to the issue of certification, under which such exemption is claimed will be used to calculate the composite grade in the examination applied for. Where the actual examination mark cannot be ascertained, a mark of 70% will be used.

7 REDUCTION, SUSPENSION & WITHDRAWAL OF CERTIFICATION

7.1 REDUCTION OF SCOPE OF CERTIFICATION

Holders of NDTSS personnel certification shall renew their certificate every 5 years & recertify every 10 years from the initial certification, If the candidate fail to meet the renewal or recertification requirements in a particular scope or sector, the certificate will be updated with reduce scope which is valid at the time of renewal or recertification. The revised scope will be updated in NDTSS database.

7.2 SUSPENSION OF CERTIFICATION

When a certified person exhibits unethical behaviour or proven cheating or violating NDTSS code of ethics his certification would be suspended until pending investigation.
Failure to resolve the issues that have resulted in the suspension, within 60 days by NDTSS, the certificate shall be withdrawn.
The certified person will be notified on suspension, in the event of suspension of certification, the certified person shall refrain from further use of the certification while it is suspended. NDTSS will post the suspended certificate holder number in the website.

7.3 MISREPRESENTATION OF CERTIFICATION

Applicants who are found to be forging, or otherwise misrepresenting examination results for certification will be referred to the NDTSS's Advisory Committee.

7.4 CERTIFICATION WITHDRAWAL

Should a complaint of a Code of Ethics violation or an abuse of the requirements for use of Certificates, Logos/marks, be notified to NDTSS, and the complaint against the Qualified/Certified person be proven by the NDTSS Discipline Committee, Qualification/Certification may be withdrawn for a period at the discretion of the NDT Certification Committee.

To regain certification, the person shall apply to the NDTSS after expiration of the period of withdrawal, as a new applicant and shall pass all relevant examinations for the NDT Method/Industry Sector.

In the event of withdrawal of certification, the certified person refrains from use of all references to the certified status.

An appeals committee (Advisory Committee) is available if required by the disqualified person.

All complaints & appeal shall be resolved within 60days, If the complaints are not able resolved in 60 days the case shall be notified by the Head of certification committee to Accreditation body.

7.5 NDTSS CODE OF ETHICS

Individuals certified or in the process of being certified must recognise that personal integrity and professional competence are the fundamental principles on which their testing activities are founded. Accordingly, it is a condition of certification that certificate holders shall undertake to:

- comply with this code of ethics,
- comply with the relevant provisions of the applicable certification scheme
- undertake only those non-destructive testing assignments for which they are competent by virtue of their training, experience, qualification and certification.
- only sign documents which they have personal professional knowledge and/or direct supervisory control,
- engage, or advise the engagement of, such specialists as are required to enable testing activities to be properly completed.
- conduct themselves in a responsible manner and utilize fair and equitable business practices in dealing with colleagues, clients and associates.
- at all times, be aware of and comply with the provisions/ requirements of codes, regulations and standards under which they are working,
- immediately report to the Certifying Body any perceived violation(s) of codes, regulations or standards.
- perform their professional duties with proper regard for the physical environment and the safety, health and well-being of the public,

- protect to the fullest extent possible, consistent with the well-being of the public and the provisions of this code of ethics, any information given to them in confidence by an employer, colleague or member of the public,
- avoid conflicts of interest with the employer or client, but when unavoidable, forthwith disclose the circumstances to the employer or client,
- maintain their proficiency by updating their technical knowledge as required to properly practice NDT in the certified methods and levels.
- indicate to the employer or client any adverse consequences which may result from an overruling of their technical judgment by a non-technical authority,
- not falsify, make claims, nor permit misrepresentation of their own or their associate's academic or professional qualifications, training, experience or work responsibilities,
- refrain from unethical acts which would discredit the Certification Scheme or bring the Certifying Body into disrepute, and refrain from making statements that the Certifying Body could consider misleading or unauthorized,
- immediately report to the Certifying Body any perceived violation(s) of this code of ethics,
- immediately report to the Certifying Body any attempt to pressure or force an individual certified to violate this code of ethics,
- inform their employer in the event that their certification is suspended, cancelled or withdrawn.

Failure to comply with the above code of ethics will be dealt with under arrangements for handling complaints and appeals And may necessitate corrective measures such as the termination of the certification process, the suspension of withdrawal of certification, publication of the violation, notification of the employer(s), union(s) and appropriate regulatory authorities and, if appropriate, additional legal action.

Additional items included in other Code(s) of Conduct/Ethics:

- Act at all times to uphold the integrity and dignity of the industry
- Verify the information on their certificates and/or wallet card. If the information is incorrect, it is their responsibility to inform the Certifying Body as soon as possible so that a new, corrected certificate and/or wallet card can be issued
- Not attempt to cheat on certification examinations, attempt to bribe or threaten Certifying Body invigilators or examiners, falsify documents, falsely claim, misrepresent or permit misrepresentation or misuse of their own or their associate's academic or professional qualifications, knowledge, training, experience, work responsibilities or certifications
- Discontinue all claims to certification upon expiry, suspension or withdrawal of certification, and upon request return to the Certifying Body any certificates and/or wallet cards issue by the Certifying Body

- Provide professional advice, express opinions,or make statements in an objective and truthful manner to the best of their ability, and on the basis of adequate knowledge
- Certificate holders shall undergo an annual test of visual acuity and submit the results of tests to the employer

+ Proper signature block (if required and appropriate for better enabling PCB's enforcement & legal considerations)

The entire NDTSS Code of Ethics can be found on the NDTSS website.

https://ndtss.org.sg/wp-content/uploads/2017/01/NDTSS-code-of-ethics.pdf