Success Story of SGNDT Certification Scheme in full compliance with ISO 9712:2012

S K Babu

Non-Destructive Testing Society, Singapore

Abstract

Non-Destructive testing plays a vital role in Singapore for various industries. To cope up with the future demands for non-destructive testing personnel and cater to the local industry needs for qualified and certified NDT operators, Non Destructive Testing Society (Singapore)-re launched the SGNDT Certification Scheme. NDTSS has started planning and preparing personnel certification since 2007, with a greater effort from the core members and with further support from AINDT, the scheme becomes a reality in 2017. The certification aims to provide a greater confidence to the clients and end users who utilize the NDT test results provided by the certified operators in compared with other certification schemes. NDE certification in Singapore varies from industries & currently relies on the in-house certification scheme based on SNT-TC-1A where organizations find it difficult to standardize the skill and reliability of operators. NDE Certification system varies globally from countries to countries. A proper certification system is required to produce successful NDT Practitioners to suit the local industry and shall include competency criteria. This paper outlines the development of Singapore NDT Certification Scheme (SGNDT), the operations, levels of qualification, the method of operation & control measures. The Training & Certification committee, Quality Management system within the certification scheme and the current system practiced in Singapore has discussed in this paper. The paper also highlights the importance of third party certification scheme the paper will also detail the creation of new scheme specific to industry based on the growing needs here in Singapore. The paper will explain the recognition of other potential qualification records to certify NDT Personnel in Singapore.

Keywords: personnel training and certification, ISO 9712:2012, SGNDT, NDT Personnel Certification, NDTSS

1 Introduction

The NDT certification scheme in Singapore, as practised in most of the countries over the world based on SNT-TC-1A, the well know ASNT recommended practices. NDT Test houses or Laboratories accredited by Singapore Accreditation Council (SAC) under the SINGLAS, ISO / IEC 17025 scheme would require a minimum of in house certified personnel to conduct Non Destructive test, however for approving the test reports, the signatories expected to have PCN / CSWIP / ACCP / AINDT Level 2 as a minimum. In recent years, many of the oil & gas companies and offshore industries expect NDT personnel qualified and certified by third party certification scheme such as PCN of BINDT or ISO 9712:2012 scheme.

The quality level of in house certified personnel varies from organization to organization; hence, most of the major contractors hire third party agencies to cross check the work done by in house inspectors. A growing trend of unsatisfactory performance of in house qualified operators tends to question the
integrity of in-house certification system. There were also growing trend of third party certified
operators from questionable Authorized Qualifying body also lost confidence with training &
certification bodes. The need for qualified and certified NDT personnel in the construction, ship
building, offshore, Oil & gas and petrochemical industry is expected to grow in the coming years and
the importance of independent certification scheme is also expected to grow proportionately. The
publication of EN ISO 9712 provide a chance to relaunch the certification scheme managed by
NDTSS to provide standardization in the qualification and certification of Non Destructive Testing
Personnel. The executive committee of Non Destructive Testing Society (Singapore), NDTSS decided
to gain accreditation by SAC to ISO/IEC 17024. This paper aims to outline the system adopted by
NDTSS to launch its SGNDT personnel certification scheme.

2 Quality System of NDTSS for SGNDT Scheme
The quality system requirements of ISO/IEC17024:2012 is implement within the training and
certification scheme of Non-Destructive Testing Society (Singapore)-NDTSS. To symbolize
Singapore, the merlion is used as the symbol of certification. An approval from National Heritage board
was obtain for the use of national symbol for the certification scheme. The logo shown below in figure1

Figure 1: SGNDT Certification Logo

The Quality System consist of a Quality Manual, Scheme Manual, quality procedures, specific
instructions, quality forms & operational forms which is depicted by the below Figure 2

Figure 2: Quality System hierarchy
The purpose of the quality manual is to provide guidance to staff whose activities can affect quality. It provides an overall view of the quality system within the society for certification of persons. The Quality Manual is intend to be a training document for all staff in Personnel Certification Committee. The Manual is a basis for auditing to check on current practice and to ensure the maintenance of all procedures. The President of the NDTSS shall be responsible for ensuring the implementation and maintenance of this Quality System. The President shall report to the NDTSS Executive board on all matters of review and improvements to the Quality System.

3 Organization & Responsibility

The NDTSS Executive committee holds the ultimate responsibility for “All Society Activities”. Wherein the quality manual, is the mechanism by which, authority for the “Certification Activity” are placed with the NDTSS Certification Committee. The members from the Advisory Committee who are independent and not be the member of the executive committee manage the Impartiality of the certification.

The President of NDTSS or Chairman of Certification committee possess authority related to certification matters & shall be responsible for decisions related to certification, including granting, maintaining & recertifying. The scope of certification shall be expanded or reduced based on the resources of the certification NDTSS. The authority for certification, suspension or withdrawing the certification shall lie with the chair of certification committee or president of NDTSS. Chair of certification possess the decision on reduction & suspension of certification. The reduction of certification would be applicable when certificated person not meet the requirements of recertification to the initial scope of certification, when a certified person exhibit unethical behavior and proven cheating or violating code of ethics his certification would be suspended and he would not be allowed to take NDTSS examination for a period of one year. Figure 3 describes the overall organization chart of NDTSS and the certification body organization chart is depicted in figure 4.

3.1 Requirements of Examiner

Examiners shall meet the requirements of the scheme based upon applicable competence standards and other relevant documents. The selections and process shall ensure that examiners assigned to an examination or part of an examination at least

a) are familiar with the relevant certification scheme,

b) have a thorough knowledge of the relevant examination methods and examination documents,
c) Have appropriate competence in the field to be examined,
d) are fluent both in writing and orally in the language of examination, and are free from any interest so that they can make impartial and non-discriminatory judgements (assessments).

Figure 3: Overall Organization Chart of the Society

Figure 4: Organization chart of Certification Scheme
4 Management Policy

The management policy extracted from the quality manual are explained below “NDTSS shall comply with all legal and contractual requirements relating to its activities as a minimum standard”

- NDTSS shall provide certification services to meet the industry needs to the latest standard
- NDTSS shall ensure that it has sufficient staff and appropriate resources (including essential equipment) to carry out its activities with due regard for quality; and that staff are sufficiently trained, experienced, qualified and competent to carry out their duties effectively, efficiently and in compliance with this policy and the quality system.
- NDTSS expects all members and subagents to be responsible for the quality of their work at all times.
- In order to provide a competent quality service to clients, the following principles must be maintained:
  - Confidentiality - as required by law; requested by clients and approved by operational standards (e.g. ISO9712).
  - Transparency - disclosure of all conflicts and potential conflicts of interest - program must be available for assessment by the accreditation body or member of public.
  - Third party - Certification assessments are not subject to influence - persons different from those who carried out the assessment (examination) take certification decisions.

5 Operation of Schemes

The Singapore NDT Certification Scheme (SGNDT) is developed by the Certification Committee of NDTSS for the certification of competence of non-destructive testing personnel, which satisfies the requirements of the international standards ISO 9712: 2012. The scheme fully comply with the standard in terms of training, qualification examination, and experience and certification process.

Australian Institute of NDT supports the Scheme manual in order to have mutual recognition of certification & to have global access for NDTSS examined person, however personnel appearing for both the scheme shall take the AINDT paper for theory examination.

The current available examination is Visual Testing, Magnetic Particle Testing, Dye Penetrant Testing, Ultrasonic Testing (Manual, PAUT, and TOFD), Radiographic Testing (Manual, CR, and DR) and
Eddy Current testing in compliance with the standard. Three levels of certification are developed; the examination also covers individual product sectors such as weld, casting, forging & Industrial sector (Pre & In-service Inspection, Manufacturing, Railway Maintenance & Aerospace).

The EN4179 is an employer based scheme, NDTSS provides approval for outside agency services and conducts exam through audited facilities. The certification becomes invalid once the certificate holder changes his / her employer.

5.1 Training

The applicant for certification 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 as applicable, 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 Board 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) that comply with the training syllabi and training hours specified in ISO 9712 or ISO 20807.

NDTSS also recognises that formal training courses provided by technical colleges and AQB’s of other certification bodies. NDTSS also 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.

5.2 Industrial Experience

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 listed in ISO 9712 or ISO 20807 or EN 4179 as applicable.
5.2.1 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.

5.3 Examinations

NDTSS conducts periodic examinations as scheduled in the website. The closing date in general for the NDTSS examinations is six (6) weeks prior to the examination week. These examinations are at Approved Examination Centres & at NDTSS HQ facility. Examination dates and examination closing dates are available from the NDTSS Certification Administrator, and on the Societies web site. Examinations for Ultrasonic Testing – PA, TOFD, CR, DR, Radiographic Testing, and Eddy Current can only be done via an authorized exam centres. The passing criteria is as defined in ISO 9712:2012

Practical examinations are normally held in conjunction with the written examinations but may require special arrangements due to availability of test pieces and test equipment. 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 are require by NEA to held R1 or L5/L6 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. Nozzle endorsement is a prerequisite for node endorsement. 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. For all product sector examination or specific geometry examination candidate should test at least two specimen. For Industrial sector examination candidate would provide with 3 specimens for practical examination. Candidates can choose a mixed endorsement by doing one specimen in each category. For example a candidate prefer to have plate & pipe endorsement, he/she shall be attempting one plate and one pipe exam. Failure of one sample would be resulting in not certified for both categories.

5.3.1 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.

5.3.2 Examiner & Examination Exemptions

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 2021. For Infrared & Vibration Testing ASNT Level 3 satisfies the requirement of an examiner. The below are some exemptions for examinations

- 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.

5.4 Scheme maintenance

The scheme committee will meet at least once a year to review the progress of examinations and to review additional resources required to improve for the betterment of the scheme. The review includes certificate holders, pass / fail rate, performance of examination banks, performance of examiners, and development of working group.

6 Decision of Certification

The decision on certification of a candidate shall be made solely by the NDTSS on the basis of the information gathered during the certification process. Those who make the certification decision shall not have participated in the examination or training of the candidate.

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.

7 Recognition of International Qualification

NDTSS will recognize all AINDT certifications for the applicable sector without any additional examinations. The NDTSS is signatory to a Multilateral Recognition Agreement within the ICNDT. Persons with certification from an ICNDT signatory certification scheme will be able to recertified to the SGNDT ISO9712 certification from NDTSS provided the evidence of examinations were held in the country or origin of certification body or examinations held in Singapore are submitted. 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 remain 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. Applicants wishing to transfer to the NDTSS certification scheme, who held 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 & with the evidence of examination held in 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 committee where the examination is held away from the host country). Failure to pass practical examination shall follow the requirements of initial examination. At the discretion of the NDTSS Certification Board, applicants may be subject to a personal interview to cover issues not clear from the written application.

8 Conclusion

This paper concludes the development of the new certification scheme launched by NDTSS. The paper would provide a guideline to support similar societies aiming for an independent certification scheme, the paper also briefed the method of international recognition and its operations. Improvements to the system will be made once all the test methods are been used for certification. Currently the industry has welcomed the move, the accreditation of the SGNDT scheme to ISO 17024 is another important step NDTSS has achieved for international recognition.

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References

The following are the references referred by the author in preparing this paper


