ICNDT

The World Organisation for NDT

ICNDT Guide to Qualification and Certification of Personnel for NDT

1 October 2014

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Foreword by Chairman of ICNDT

The competence of those carrying out non-destructive testing is an essential pre-requisite for the achievement of quality and reliability. Qualification and certification of NDT personnel in accordance with international standards, such as the unified ISO 9712 (Non-destructive testing – Qualification and certification of personnel), helps to assure the competence of NDT personnel and thereby assists global business and safety standards.

The ICNDT, with a track record exceeding 50 years in international cooperation in NDT, is dedicated to supporting best practice in the implementation of standards through this Guide. As Chairman, I express thanks to my colleagues in ICNDT, ISO and CEN for their assistance in preparing this document.

Mike Farley
Chairman, ICNDT

Foreword by Chairmen of ISO TC135 and CEN TC138

Since the effectiveness of any application of non-destructive testing depends upon the capabilities of the persons who perform or who are responsible for the test, a procedure was developed to provide a means for evaluating and documenting the competence of personnel whose duties require the appropriate theoretical and practical knowledge of the non-destructive tests that they perform, specify, supervise, monitor or evaluate. An added incentive stems from the worldwide comparability of a wide range of industrial applications requiring common non-destructive testing approaches.

It is recognised that the efforts of ICNDT have made a valuable contribution to the implementation of the numerous schemes for qualification and certification of NDT personnel. An extensive application of this Guide within industry will improve reliability of industrial products and safety of the worldwide community.

Hajime Hatano
ISO TC135 Chairman

Patrick Fallouey
CEN TC138 Chairman

Foreword by Chairman of the PGP and Editorial Committee

The original Guide, 'ICNDT Recommended Guidelines for Qualification and Certification of NDT Personnel according to ISO 9712', was published in June 2004 at the 16th WCNDT in Montreal, based on a first draft produced by Mr G Nardoni. The first update was approved for publication at the 17th WCNDT in Shanghai. The next version was published to coincide with the 18th WCNDT in Durban and the agreements in ISO and CEN to unify ISO 9712 and EN 473 in a new standard ISO 9712, published in 2012. This version (2014) reflects updates in ISO 17024 and the developments in ICNDT to create an international Multilateral Recognition Agreement and to document how different certification bodies are implementing ISO 9712:2012.

ICNDT will update this document periodically and will provide the latest version online via its website (www.icndt.org). Users are strongly advised to check that they have the latest version of this document and the referenced standards. Comments and suggestions are welcome and should be sent to the ICNDT secretariat.

Douglas Marshall
Chairman PGP and Editorial Committee

1. Background

The prime purpose of this Guide, which has been prepared under the auspices of the International Committee for Non-Destructive Testing (ICNDT), is to promote best practice in the qualification and certification of NDT personnel according to the international standard ISO 9712[1]*.

The competence of NDT personnel is a key element in achieving reliability in non-destructive testing (NDT) and is vital to ensure the quality and safety of products and installations. The ICNDT Guide is of importance to all tiers in the management of NDT operations: regulators, inspection bodies, certification bodies, industry, NDT service companies and supervisors of NDT personnel.

The ICNDT has promoted worldwide dissemination of NDT technologies and the harmonisation of personnel certification schemes for more than 50 years. The decision by ICNDT to promote the adoption of ISO 9712 as a basic standard for third-party qualification and certification of NDT personnel arises from the need to achieve a more consistent standard of basic knowledge and practical competence. Such standardisation becomes ever more important as the globalisation of trade increases.

Third-party qualification and certification is widely recognised as conferring a number of advantages:

- It complies with an internationally-agreed ISO standard that is increasingly being adopted worldwide;
- It utilises an internationally-developed training syllabus;
- Examinations (theory and practical) are provided directly by certification bodies or through authorised qualifying bodies and authorised examination centres under the control of certification bodies (many of which are linked to national NDT societies);
- It provides a harmonised standard for training, qualification and certification of NDT personnel and can be used as the base level for more specific employer-based or third-party certification relevant to particular products or installations.

The central role of ISO 9712 among standards for third-party certification, the historical development of NDT personnel certification and ICNDT's role is explained within this Guide in Appendices 1 and 2, and a list of ICNDT members at the time of writing is given in Appendix 3.

The correct use of third-party qualification and certification of NDT personnel is dependent on the employers' recognition of responsibility for NDT personnel. This is important in terms of good quality management practices (outlined in ISO 9001[2] at clause 6.2 – Human Resources), product liability, meeting the requirements for accreditation and meeting the requirements of product standards and codes, such as the ASME Boiler and Pressure Vessel Code (see Appendix 4) and the European Pressure Equipment Directive[3] (97/23/EC – see Appendix 5). An explanation of the employer's responsibilities is provided in Chapter 3.

In each of the regions where ICNDT has members (Africa, the Americas, Europe, the Middle East and the Asia-Pacific region), ISO 9712 has been adopted as a basis for third-party certification schemes. For example, Brazil and Argentina have accredited certification schemes that comply with ISO 9712 and Canada also has a certification scheme based on the standard. In the USA, the American Society for Nondestructive Testing (ASNT) introduced ANSI/ASNT standard CP 106[4], which is closely aligned with ISO 9712:2005 and is currently working towards a version based on ISO 9712:2012. Many other countries in Latin America: Uruguay, Peru, Bolivia, Colombia and Venezuela, are developing national schemes based on ISO 9712. In Africa, South Africa has an accredited ISO 9712 based certification system and Tunisia is introducing a similar system. In Europe, a large number of countries have schemes which comply with ISO 9712. A listing of certification schemes and their current status is provided in Appendix 6.

The ICNDT is endeavouring to promote international recognition of third-party certification schemes through a global Multilateral Recognition Agreement (MRA) and details are given in Appendix 7. In many countries around the world, certification bodies that provide ISO 9712 certification have gained accreditation or approval by government agencies or accreditation bodies to ISO 17024[5] in both voluntary and regulatory sectors. This is discussed in Chapter 4.

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* *The reference numbers given in square brackets refer to the documents listed in Chapter 5, Bibliography.*

Details of other approaches to NDT personnel certification are covered by EN 4179[4] (for aerospace certification) and SNT TC 1A[7] (for in-company certification). In certain circumstances it may be necessary or desirable, for economic or safety reasons, to qualify NDT personnel for specified limited applications and standards covering this are described in Appendix 8.

2. Recommendations on qualification and certification

Recommendations to users of central third-party certification

When central third-party certification is appropriate, it is recommended that regulators and industry define the levels of competency of NDT personnel who are certified in accordance with ISO 9712[11] by a certification body accredited to ISO/IEC 17024[15].

Regulators, users and auditors of NDT operations should recognise the importance of employers of NDT personnel properly fulfilling their responsibilities to authorise personnel to work after first confirming that their employees are adequately trained, experienced and qualified.

Recommendations to certification bodies

Certification bodies are urged to provide certification to ISO 9712 in order to maximise the value of their certification. In anticipation of future harmonisation, their training syllabuses should encompass the requirements of ISO/TR 25107[18].

National NDT societies seeking to establish national certification schemes are recommended to consider seeking cooperation with an existing personnel certification body (PCB) as an alternative or complementary approach. This does not preclude setting up a local PCB.

NDT societies or PCBs that are operating outside their own home country are encouraged to cooperate closely with the national NDT society where they wish to operate. In practice, this should be achieved by means of a signed agreement between the parties. When there is a disagreement, the matter should be referred to ICNDT for mediation.

Guidance for developing countries seeking to establish national certification schemes is provided in Appendix 9.

Recommendations to national standards bodies

In adopting the international standard ISO 9712, the ISO member body is strongly urged to apply it without deviation from the original text in order to ensure that it acts as a harmonising influence. Significant deviations, although permitted under ISO Guide 21[19], could result in a refusal to recognise or accept NDT personnel certification.

3. Responsibilities of the employer

An employer of NDT personnel carries important responsibilities for the overall quality of NDT operations. These should be reflected in the employer's quality procedure for NDT (which may be known as the written practice*). The employer retains these responsibilities whether he uses third-party certification, in-company certification, or a combination of both.

This section of the ICNDT Guide clarifies the employer's responsibilities and gives guidance on how the employer should fulfil these responsibilities. In this context, the employer (or responsible agency) is defined as 'The organisation for which the candidate works on a regular basis'. If the individual is self-employed, he shall assume all responsibilities specified for the employer or responsible agency.

It is a central tenet of the standard that the employer has overall responsibility for the results of NDT operations and is fully responsible for the authorisation of his staff to work. In practice, this must include checking that the NDT tasks to be carried out are within the scope of the individual's certification (sector, method and level) and, if they are not, organising additional company job-specific training and/or examinations – see Figure 1.

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* *See, for example, SNT-TC-1A[7] published by ASNT.*

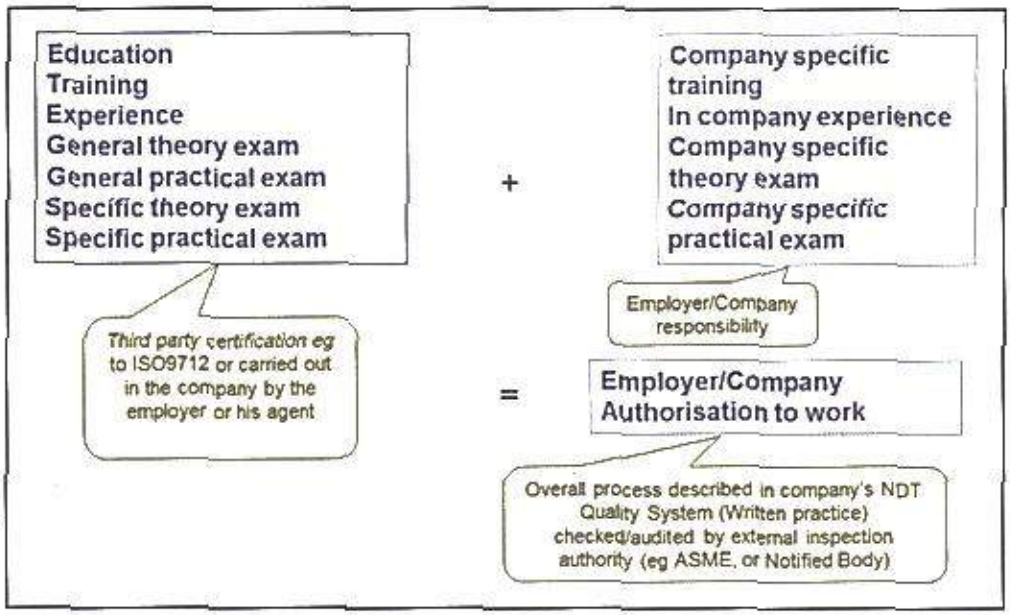

Figure 1. Elements of personnel certification

The employer is responsible for introducing candidates to the certification body and for documenting the candidate's education and prior experience. (If the candidate is unemployed or self-employed, the declaration of education, training and experience shall be attested to by at least one independent party.)

The employer must ensure annually that employees meet the visual acuity requirements of the certification body and must keep records of work experience that will be needed to demonstrate continuity of satisfactory work activity without significant interruption. This is important both for his own quality assurance and to support renewal/recertification.

To fulfil these responsibilities, the employer should prepare and implement a quality procedure (or written practice) covering at *least the above responsibilities and maintain adequate records.*

The quality procedure, which shall additionally cover the correct administration and control of NDT personnel in order to meet the quality requirements of the company, its customers and relevant international or national regulations, will include reference to:

- Applicable codes and standards;
- General responsibilities of Levels 1, 2 and 3;
- Certification required (sector, method, level);
- Persons designated by the employer to be responsible for issuing the authorisation to operate;
- Control of in-house training and examination supplementary to that carried out during the ISO 9712 qualification and certification process. This will include job-specific training for tasks outside the scope of the individual's certification and updating with respect to new equipment or techniques;
- Responsibility for maintenance of records. The employer must maintain records for each of his NDT personnel including:
  - training;
  - education;
  - work experience;
  - vision test results;
  - certification examination results.

The results may be recorded using a suitable checklist – see, for example, Figure 2.

COMPANY NAME:			
OPERATOR'S NAME:			
SCOPE OF CERTIFICATION (sector, method, level):			
Requirement	**Evidence**	**In File**	**Accepted**
Valid test certificate for near vision acuity:			
Valid certificate of unimpaired colour vision:			
Work experience (in months according to level):			
Training hours (in hours according to level):			
Successful completion of qualification examination:			
Issued ISO 9712 certification:			
Job-specific training:			
Product/materials			
NDT equipment/systems			
NDT instructions/procedures			
Safety			
Responsible Level 3 Acceptance			
Signature:			
Name:			
Position:			
Date:			

Figure 2. Employer checklist leading to authorisation to work

If all of the above are acceptable, and the employer is satisfied that the above-named employee can be authorised to carry out work for this company in respect of the method and level indicated, the authorisation to work is signed for the employer by the Company Authorised Person – see, for example, Figure 3.

COMPANY NAME:						
This authorisation is issued to:						
who has demonstrated having successfully met the requirements of the Company Quality Procedure (COMPANY X – DOCUMENT REF) in respect of education, training, work experience and examination and is authorised to perform NDT as follows:						
Method	Technique	Level	Date of ISO 9712 certification	Due date of renewal or recertification	Signature of authorised company representative	Date

Figure 3. Authorisation to perform non-destructive testing

4. Requirements for NDT personnel certification bodies

Specific requirements for NDT personnel certification bodies

ISO 9712:2012[1] is the latest internationally-recognised and widely-accepted standard for qualification and third-party certification of NDT personnel, replacing ISO 9712:2005 and EN 473.

An important clause in ISO 9712 facilitates transition from the earlier standards to the new one. Certification achieved under either EN473 or ISO 9712:2005 is considered to comply with the 2012 standard until the next renewal or recertification is due. Certification to the new standard is considered compliant with the old standards when these are specified.

General requirements for personnel certification bodies (PCB)

Clause 5.2.1 of ISO 9712:2012 requires that the certification body shall fulfil the requirements of ISO/IEC 17024[9]. A PCB in compliance with ISO/IEC 17024 will be impartial in its decisions on certification and will ensure that assessments leading to certification are fair, valid and reliable.

Quality management system (QMS)

ISO/IEC 17024 requires a QMS 'that is capable of supporting and demonstrating the consistent achievement of the requirements of this international standard' (Clause 10.1 of ISO/IEC 17024:2012). The standard states that an ISO 9001-compliant management system would fulfil the requirement.

Accreditation

Accreditation is third-party attestation related to a conformity assessment body conveying a formal demonstration of its competence to carry out specific conformity assessment tasks. Accreditation is performed by an accreditation body which is an authoritative body. Requirements for accreditation bodies are detailed in ISO/IEC 17011:2004[10].

The accreditation process is intended to increase the confidence of users of certification in the status of a certification body. Accreditation reduces the risk for users of certification by ensuring that accredited certification bodies and appropriate bodies conducting outsourced work, for example qualification bodies, examination centres etc, are competent to carry out the work they undertake within their scope of accreditation.

Accreditation of personnel certification bodies is performed according to ISO/IEC 17024. The latest edition of ISO/IEC 17024 was published in July 2012. Major changes in the standard are the following:

- new terms were added;
- section for personnel became more detailed;
- section for management of impartiality became more detailed;
- a new section with more information about the structure of the certification body in relation to training was added;
- more detail added for records and information requirements;
- more detailed description of certification schemes;
- more detail provided for the certification process requirements;
- new sections were added for appeals, complaints and management systems requirements;
- a 'principles' section added in Annex A.

There is an international grouping of accreditation bodies known as the International Accreditation Forum (IAF), and there is also a European equivalent known as European co-operation for Accreditation (EA). Accreditation bodies that are members of the IAF and EA are required to operate at the highest standard and to require that the conformity assessment bodies they accredit comply with appropriate international standards, such as ISO 9712, which in turn requires conformance to ISO/IEC 17024.

The Certification Executive Committee of the European Federation for NDT (EFNDT) has prepared specific guidance

to accreditation bodies assessing NDT personnel certification bodies for compliance with ISO/IEC 17024:2003. The EFNDT guidance was published as a CEN Technical Report CEN/TR 16332. Although some of the standards referred to in this document are now out of date, it still provides useful guidance on the interpretation of ISO/IEC 17024 for application to the certification of NDT personnel. At the time of writing, there is an intention to revise the document.

The EA has a Multilateral Agreement (MLA), which is operated in compliance with the general requirements for peer assessment of conformity assessment bodies and accreditation bodies set out in ISO/IEC 17040[11], covering recognition of accreditations of personnel certification bodies in Europe. At the time of writing, the IAF does not have an MLA covering the operations of its members offering accreditation to ISO/IEC 17024, though it is expected to implement such an MLA in the near future.

Accreditations granted by signatories to the EA MLA facilitate the development of Multilateral Recognition Agreements (MRA) amongst groups of PCBs operating certification of persons for specific activities such as NDT, which in turn should allow accredited conformity assessment certificates, for example for ISO 9712, gained in one part of the world to be recognised elsewhere in the world.

Against this background, the ICNDT has created its own Multilateral Recognition Agreement with criteria and processes that take advantage of and complement accreditation (see Appendix 7).

5. Bibliography

This section lists all documents referred to in the main text and the appendices. It provides a list of the latest editions (at the time of writing) of standards dealing with or impacting upon the qualification and certification of personnel engaged in NDT.

1. ISO 9712:2012 Non-destructive testing – Qualification and certification of NDT personnel
2. ISO 9001:2008 Quality management
3. 97/23/EC Pressure Equipment Directive (PED) – overview online at http://bit.ly/1mdqBRH
4. ANSI/ASNT CP-106-2008 Non-destructive testing – Qualification and certification of personnel
5. ISO/IEC 17024:2012 Conformity assessment – General requirements for bodies operating certification of persons
6. BS EN 4179:2009 Aerospace series. Qualification and approval of personnel for non-destructive testing
7. SNT-TC-1A (2011) ASNT Recommended Practice for Personnel Qualification and Certification in Non-destructive Testing
8. ISO/TR 25107:2006 Non-destructive testing – Guidelines for NDT training syllabuses
9. ISO/IEC Guide 21-1:2005 Regional or national adoption of international standards and other international deliverables — Part 1: Adoption of international standards
10. ISO/IEC 17011:2012 Conformity assessment – General requirements for accreditation bodies accrediting conformity assessment bodies
11. ISO/IEC 17040: 2005 Conformity assessment – General requirements for peer assessment of conformity assessment bodies and accreditation bodies
12. ISO 20807:2004 Non-destructive testing – Qualification of personnel for limited application of non-destructive testing
13. ISO TS 11774:2011 Non-destructive testing – Performance-based qualification
14. ACCP ASNT Central Certification Program – Frequently Asked Questions online at http://bit.ly/1rdnTng
15. ANSI/ASNT CP-189-2011 ASNT Standard for Qualification and Certification of Nondestructive Testing Personnel
16. CEN/TR 15589:2014 Non-destructive testing – Code of practice for the approval of NDT personnel by recognised third-party organisations under the provisions of Directive 97/23/EC

It should be noted that the above list is not exhaustive. The status of the referenced documents should be ascertained by reference to the issuing organisation before use.

APPENDICES

Appendix 1: The role of ICNDT and its regional groups in the harmonisation of qualification and certification

Introduction

This appendix highlights the role of the ICNDT members and the regional groups of ICNDT with respect to qualification and certification of NDT personnel and summarises the 50 years of dedication by ICNDT to this field. It also references the documents produced on qualification and certification of NDT personnel, the very effective liaison with ISO TC135 on the harmonisation of standards, and provides some details concerning on-going work.

Foundation of ICNDT

The first World Conference on NDT was held in 1955 by a group of European countries, USA, Japan, China, India and the USSR. Its main objective was to gather scientists and technologists from all over the world in order that they could pool together their common experiences in promoting the development of the application of NDT.

ICNDT, as an international organisation, was formed on 15 March 1960, just prior to the 3rd World Conference on Non-Destructive Testing, which was held in Tokyo, Japan, from 16-21 March 1960.

ICNDT is a non-profit association devoted to the development of the science and practice of non-destructive testing in conjunction with existing NDT societies and recognised regional groupings of NDT societies.

ICNDT has recently broadened its horizons and has set itself a number of important objectives:

- To be the international organisation that acts as the prime focus on non-destructive testing for the benefit of the involved community and the public in general;
- To promote international collaboration in all matters relating to NDT;
- To encourage the foundation, growth, development and cooperation of national and regional societies;
- To assign the place and organisation of the World NDT Conference to an appropriate NDT society or group of societies, at intervals of four years;
- To establish with continental groupings of NDT societies initiatives for implementing ICNDT policy;
- To encourage the formulation of international standards on non-destructive testing in collaboration with the International Organization for Standardization (ISO) and other standards bodies;
- To establish an ICNDT Multilateral Recognition Agreement (MRA) of NDT personnel certification and the development of a process for the ICNDT assessment and approval of NDT personnel certification bodies.

World Conferences on NDT (WCNDT)

The NDT World Conference organised by ICNDT was the first concrete expression of the desire to cooperate in the dissemination of NDT. The 1st World Conference was held in Brussels in 1955 as a tribute to Gevaert, the producer of X-ray film, which sponsored international meetings in Antwerp.

A list of all World Conferences, including planned venues up to 2020, is given at the end of this appendix.

Besides the need to establish, improve and disseminate NDT techniques, the need for harmonisation of qualification and certification of NDT personnel has grown through the years, with this topic becoming the focus of many ICNDT meetings and an important topic of discussion during the world conferences. Those world conferences that resulted in significant advances in the field of qualification and certification of NDT personnel were:

- **Montreal, 1967 – Qualification and certification of NDT personnel**

  In 1967, during the 5th World Conference on NDT held in Montreal, ICNDT adopted the following resolutions:

  "The Committee agrees that the appropriate time has arrived for the establishment of an 'International Recommendation on the Qualification of NDT Personnel' prepared by a task group of ICNDT."

  "All delegates are requested to promote, through their national standardisation organisations, the importance of establishing an ISO Technical Committee to deal with NDT."

- **Hanover 1970 – Discussions at World Conference**

  The 1967 discussions had a strong impact on ICNDT. Three years later, at the 6th World Conference in Hanover in 1970, the first contributions on the qualification and certification of NDT personnel were given by France, Germany, Japan, the United Kingdom and the USA. At that meeting the following statement on personnel certification was made:

  "Representatives of each country will submit statements on the qualification system prevailing in their country. These topics should form a topic for discussion at a specific session. In the meantime, statements of the present position will be communicated to ICNDT members."

- **Warsaw 1973 – Formation of Task Group**

  In Warsaw in 1973, ICNDT, during its 10th meeting, appointed a Task Group for the preparation of guidelines dealing with the qualification and certification of NDT personnel.

- **Cannes 1976 – ICNDT WH 76 – Liaison with ISO**

  The first document of the ICNDT Task Group on qualification and certification of NDT personnel was presented at the round table discussion in Cannes in 1976, during the 8th World Conference. The document was a comparison of all the existing schemes among the members of ICNDT. This was the first step towards a more complete series of guidelines on the qualification and certification of NDT personnel. Recommendations were made to make ISO knowledgeable on the importance of a working group on NDT. It was agreed at this ICNDT meeting to forward the document to ISO TC135.

- **Melbourne 1979 – Initiation of ICNDT document on minimum technical requirements for qualification and certification of NDT personnel**

  In 1979 in Melbourne, during the 9th World Conference on NDT, a further step forward on the topic of the qualification and certification of NDT personnel was made. Based on the Cannes document and the information available, the following statements were made:

  "Two types of certification schemes are present in the world: independent body certification and employer-based certification. Mutual recognition of NDT certificates may be possible and the working group shall try to facilitate this."

  "Three levels of qualification are generally applied by the majority of the country members."

  In the same meeting it was decided to prepare a document on the minimum technical requirements for each level of qualification relative to the different methods of NDT (RT, UT, PT, MT, ET and LT).

- **Moscow 1982 – Review of draft document WH-85**

  After extensive work, in which all the main countries of the world were involved, the minimum technical requirements for qualification and certification of NDT personnel were presented in Moscow at the 15th ICNDT meeting. It received general consensus with minor changes made in order to give more completeness in the document.

- **Las Vegas 1985 – Final approval of WH-85**

  In 1985 in Las Vegas, during the 11th World Conference, the document received final approval for publication as an ICNDT document:

  ICNDT WH-85, 'The Complete Recommendations on International Harmonisation of Training, Qualification and Certification of NDT Personnel' (November 1985).

  The document was sent to ISO TC135 and was used as a reference in the preparation of the ISO 9712 standard on the qualification and certification of NDT personnel, which was published in 1992.

- **New Delhi 1996 – ISO 9712 standard**

  The 24th ICNDT meeting highlighted the work carried out by ISO TC135 in editing the ISO 9712 standard and its extensive application in the member countries. It was noted that the implementation of ISO 9000 would encourage certification in accordance with ISO 9712.

- **Copenhagen 1998 – ICNDT seminar on ISO 9712**

  In 1998 in Copenhagen, during the 25th ICNDT meeting, it was decided to create a common framework, which would comply with ISO 9712. In addition, it was proposed to prepare a guidance document for the application of ISO 9712. Following these proposals it was decided at the ICNDT PGP meeting in China (Shantou) to organise the first ICNDT seminar on ISO 9712 certification during the world conference in Rome.

- **Rome 2000 – Updating ICNDT WH-85**

  During the 27th ICNDT meeting in Rome, a complete revision of the document ICNDT WH-85 relative to minimum technical requirements was handed directly to the ISO TC135 chairman. Many interesting items relative to global mutual recognition of NDT schemes emerged from the ISO 9712 seminar.

- **Brisbane 2001 – ICNDT Recommended Guidelines for Qualification and Certification of NDT Personnel according to ISO 9712**

  During the PGP meeting held in Brisbane, recognising that an increasing number of schemes are aligned to ISO 9712 (including EN 473, ACCP, etc), it was proposed to draft ICNDT Guidelines for Qualification and Certification of NDT Personnel based on ISO 9712.

- **Montreal 2004 – ICNDT Recommended Guidelines for Qualification and Certification of NDT Personnel according to ISO 9712**

  The first edition approved by the ICNDT Editorial Committee was published and circulated to delegates at the 16th WCNDT.

- **Shanghai 2008 – Update of Guide including ICNDT recommendations and ICNDT workshop on harmonisation of EN 473 and ISO 9712**

  A new edition of the Guide incorporating important recommendations from ICNDT was approved for publication. A workshop was held with participation from ISO TC135 and CEN TC138 to explore the differences between the standards EN 473 and ISO 9712. It was concluded that the differences were not significant and it was announced that the two committees would work together to achieve a single harmonised standard. ICNDT was invited to become a formal liaison member of TC135.

- **Durban 2012 – Update of Guide in anticipation of ISO 9712:2012**

  An updated version of the Guide was issued, recognising that the process to combine ISO 9712 and EN 473 into a single global standard was well underway. The ICNDT General Assembly gave conditional approval to the introduction of an ICNDT Multilateral Recognition Agreement (ICNDT MRA) and an ICNDT assessment scheme for PCBs (ICNDT PCBA). The first ICNDT Certification Executive Committee was nominated.

The role of NDT societies

In most countries, the major catalyst for establishing a certification scheme is the national NDT society. The society provides a focus for information on NDT technologies, training and certification and, through the ICNDT, a link to the international NDT community. More than 70 countries have established NDT societies that are members of ICNDT (see Appendix 3) and ICNDT continues to assist the formation of new societies.

The role of ICNDT regional groups

The regional groups within ICNDT have a primary role in the promotion of NDT and in providing information on how to set up an NDT society. Regional groups also have a strong focus on the recognition and harmonisation of NDT personnel certification schemes within that region and alignment of these certification schemes to ISO 17024.

Four regional groups are active:

- African Federation of NDT;
- Asia-Pacific Federation – www.apfndt.org;
- European Federation for NDT – www.efndt.org;
- Pan-American Committee;

Each regional group has their own constitution which, in terms of both strategy and policy, is complementary to that of ICNDT. Regional conferences play an important role in the development and promotion of NDT.

IAEA/ICNDT cooperation

In order to promote NDT in developing countries, the International Atomic Energy Agency (IAEA) and ICNDT have forged a strong relationship based on mutual cooperation. In particular, ICNDT experts participate in many IAEA projects that involve the training, qualification and certification of NDT personnel.

ICNDT achieves legal status in 2008

ICNDT was formally registered as a legal non-profit international association in Vienna in 2008, in accordance with the Austrian Corporations Act. An up-to-date list and contact addresses are given on the ICNDT website at www.icndt.org

ICNDT website

Information on all ICNDT activities is provided on the ICNDT website (www.icndt.org). This site serves to improve and strengthen links between NDT societies and regional groups. ICNDT also publishes a regular journal.

World Conferences on NDT (promoted by ICNDT)

Conference No	*Year*	*City*	*Country*
1st WCNDT	1955	Brussels	Belgium
2nd WCNDT	1957	Chicago	USA
3rd WCNDT	1960	Tokyo	Japan
4th WCNDT	1963	London	Great Britain
5th WCNDT	1967	Montreal	Canada
6th WCNDT	1970	Hanover	Germany
7th WCNDT	1973	Warsaw	Poland
8th WCNDT	1976	Cannes	France
9th WCNDT	1979	Melbourne	Australia
10th WCNDT	1982	Moscow	Russia
11th WCNDT	1985	Las Vegas	USA
12th WCNDT	1989	Amsterdam	The Netherlands
13th WCNDT	1992	Sao Paulo	Brazil
14th WCNDT	1996	New Delhi	India
15th WCNDT	2000	Rome	Italy
16th WCNDT	2004	Montreal	Canada
17th WCNDT	2008	Shanghai	China
18th WCNDT	*2012*	*Durban*	*South Africa*
19th WCNDT	2016	Munich	Germany
20th WCNDT	2020	Seoul	South Korea

Appendix 2: Qualification and certification of NDT personnel in accordance with ISO 9712:2012

Two 'major' third-party certification systems coexisted for several years: EN 473 and ISO 9712. Following several initiatives from industry and ICNDT, the two certification committees in charge of these standards (ISO TC135 and CEN TC138) decided, in 2009, to launch a harmonisation process intending to produce a unique ISO standard. This process has involved more than 20 countries and has succeeded in producing ISO 9712:2012[1], which was published in the third quarter of 2012 and which replaces EN 473.

The standard covers the qualification and certification of NDT personnel in one or more of ten NDT methods: acoustic emission testing, eddy current testing, infrared thermographic testing, leak testing (hydraulic pressure tests excluded), magnetic testing, penetrant testing, radiographic testing, strain testing, ultrasonic testing and visual testing (direct unaided visual tests and visual tests carried out during the application of another NDT method are excluded).

The responsibilities of the certification body, its authorised qualifying bodies (where used) and examination centres are defined, and the role of the employer is clarified. Three levels of qualification are defined (Levels 1, 2 and 3). Qualification is 'specific' to a defined industrial or product sector(s).

Eligibility for certification is specified, covering vision requirements for all levels, minimum training requirements and the required duration of industrial experience.

Qualification examinations are defined – comprising both written and practical parts – for each level, with minimum numbers of questions and, for Levels 1 and 2, test specimens specified.

Rules are specified governing administration of certification, including the conditions for renewal and recertification.

The main changes from the previous EN and ISO standards are:

- clarification of the roles of the certification body, the authorised qualifying bodies (where used) and examination centre;
- modification of the required training hours (with a rewrite of the relevant clause);
- ISO/TR 25107[8] Training Guidelines referenced as a basis for certification bodies to define their training syllabuses (other documents demonstrated as equivalent may be used);
- a rewrite of the clause about required experience (for more clarity);
- introduction of 'digital certificates/e-assessment';
- for Level 3 recertification, deletion (compared to ISO 9712) of a precise requirement for demonstration of practical skill (practical test), replaced by demonstrated evidence of this skill (to be accepted by the certification body).

The new standard has been implemented widely (see Appendix 6). ICNDT has carried out an exercise to document how different PCBs have implemented the standard where options are allowed. This comparison is presented in Appendix 11.

Appendix 3: ICNDT membership directory

The following list shows all ICNDT members at the time of writing, with their ICNDT membership status (Full or Associate). For an up-to-date list of ICNDT member societies and contact details, go to: http://www.icndt.org/Directory.asp

Country	Society	Membership status
Algeria	Centre de Recherche Scientifique et Technique en Soudage en Controle/Federation (CSC/FALEND)	Associate member
Argentina	Asociación Argentina de Ensayos No Destructivos y Estructurales (AAENDE)	Full member
Australia	Australian Institute for NDT (AINDT)	Full member
Austria	Austrian Society for NDT (ÖGfZP)	Full member
Bangladesh	Bangladesh Society for NDT (BSNDT)	Full member
Belarus	Belarusian Association for NDT and Technical Diagnostic (BANDT)	Full member
Belgium	Belgian Association for NDT (BANT)	Full member
Bosnia & Herzegovina	Bosnian and Herzegovinan Society for NDT	Associate member
Brazil	Associação Brasileira de Ensaios Não Destrutivos e Inspeção (ABENDI)	Full member
Bulgaria	Bulgarian Association for Non-Destructive Testing (BGSNDT)	Full member
Canada	Canadian Institute for NDE (CINDE)	Full member
China, People's Republic of	Chinese Society for Non-Destructive Testing (ChSNDT)	Full member
Colombia	Asociación Colombiana de Soldadura y Ensayos No Destructivos (ACOSEND)	Full member
Costa Rica	National Committee for NDT	Associate member
Croatia	Croatian Society for Non-Destructive Testing (CrSNDT)	Full member
Czech Republic	Czech Society for Non-Destructive Testing (CNDT)	Full member
Denmark	Danish Society for NDT	Full member
Ecuador	Escuela Politecnica del Litoral (ESPOL)	Associate member
Egypt	Egyptian Society for Industrial Inspection	Associate member
Finland	Finnish NDT Society	Full member
France	French NDT Organisation (COFREND)	Full member
Germany	German Society for Non-Destructive Testing (DGZfP)	Full member
Greece	Hellenic Society of Non-Destructive Testing (HSNT)	Full member
Hungary	Hungarian Association for Non-Destructive Testing (MAROVISZ)	Full member
India	Indian Society for Non-Destructive Testing (ISNT)	Full member
Indonesia	Asosiasi Uji Tak Rusak Indonesia (AUTRI)	Full member
Iran	Iranian Institute of Welding and Non-Destructive Testing (IWNT)	Associate member (awaiting ratification)
Israel	Israeli National Society for Non-Destructive Testing (ISRANDT)	Full member
Italy	Italian Society for NDT (AIPnD)	Full member
Japan	Japanese Society for Non-Destructive Inspection (JSNDI)	Full member
Kazakhstan	Non-Destructive Testing and Technical Diagnostic Association, Republic of Kazakhstan	Full member
Kenya	Non-Destructive Testing Society of Kenya (NDTK)	Full member
Korea, South	Korean Society for Non-Destructive Testing (KSNT)	Full member
Latvia	Latvian NDT Society	Full member
Lebanon	Industrial Research Institute (IRI)	Full member
Lithuania	Lithuanian Society for NDT and Technical Diagnostics (LNBD)	Full member
Malaysia	Malaysian Society of NDT (MSNT)	Full member
Mexico	Instituto Mexicano De Ensayos No Destructivos A.C. (IMENDE)	Full member
Moldova	National Society on NDT and Technical Diagnostics (AN NTD)	Full member

Country	Society	Membership status
Mongolia	Mongolian Society for NDT (MSNDT)	Associate member
Netherlands	Nederlandse Vereniging voor Kwaliteitstoezicht, Inspectie en Niet-destructieve Techniek (KINT)	Full member
New Zealand	New Zealand Non-Destructive Testing Association Inc (NZNDTA)	Full member
Nigeria	Nigerian Society for NDT	Full member
Norway	Norwegian NDT Society (NSNDT)	Full member
Pakistan	Pakistan Society for NDT (PASNT)	Full member
Philippines	Philippine Society for Non-Destructive Testing Inc (PSNDT)	Full member
Poland	Polish Society for NDT and Technical Diagnostics (PTBNIDT / SIMP)	Full member
Portugal	Associacao de Laboratorios Acreditados de Portugal (RELACRE)	Full member
Romania	Romanian Association of NDT (ARoENd)	Full member
Russian Federation	Russian Society for NDT and Technical Diagnostics (RSNTTD)	Full member
Serbia	Serbian Society for NDT (SDIBR)	Full member
Singapore	Non-Destructive Testing Society (Singapore) (NDTSS)	Full member
Slovakia	Slovak Society for Non-Destructive Testing (SSNDT)	Full member
Slovenia	Slovenian Society for Non-Destructive Testing (SSNDT)	Full member
South Africa	Southern African Institute for NDT (SAINT)	Full member
Spain	Spanish Association for NDT (AEND)	Full member
Sri Lanka	Society for Non-Destructive Testing, Sri Lanka (SNDT)	Full member
Sudan	Sudanese Society for Non-Destructive Testing (SSNDT)	Full member
Sweden	Föreningen för Oförstörande Provning (FOP)	Full member
Switzerland	Schweizerische Gesellschaft für Zerstörungsfreie Prüfung (SGZP / SSNT)	Full member
Taiwan	Non-Destructive Testing Society of China-Taipei (SNTCT)	Full member
Thailand	Thai Society for NDT (TSNT)	Full member
Tunisia	Tunisian Committee for NDT c/o CETIME (COTEND)	Full member
Turkey	The Turkish Society for Non-Destructive Testing (TURK NDT)	Full member
Ukraine	Ukrainian Society for NDT (USNDT)	Full member
United Kingdom	The British Institute of Non-Destructive Testing (BINDT)	Full member
United States of America	The American Society for Nondestructive Testing (ASNT)	Full member
Uruguay	Asociaciòn Uruguaya de Ensayos No Destructivos (AENDUR)	Full member
Uzbekistan	Uzbekistan Society for Non-Destructive Testing (UzSNDT)	Full member
Venezuela	Associacion Venezolana de Ensayos No Destructivos (ASOVEND)	Full member
Vietnam	Vietnam Association for NDT (VANDT)	Associate member

Appendix 4: ASME position on recognition and acceptance of central certification programmes

The ASME Boiler and Pressure Vessel Code includes specific requirements for NDT and for the qualification or certification of NDT personnel in appropriate sections. This code is used all around the world, including in regions such as Europe, where compliance with other regulations, for example the Pressure Equipment Directive, is facilitated by the use of third-party certification and in countries where third-party certification is mandatory.

In 2003, following presentations from EFNDT and the European Boilermakers' Association, each seeking to avoid unnecessary double certification, to take advantage of the benefits of third-party certification and to facilitate meeting the requirements of the PED, ASME advised a revision to the ASME Boiler and Pressure Vessel Code Section V, Article 1. An amended paragraph T120 was approved and published in the 2003 Addenda. The option was also included in Code Sections I and VIII, Divisions 1, 2 and 3. The current wording of Section 1 in the 2013 edition of the Code, para PW-50.1 is reproduced in Figure 4.

PW-50 QUALIFICATION OF NONDESTRUCTIVE EXAMINATION PERSONNEL

PW-50.1 The Manufacturer shall be responsible for assuring that nondestructive examination (NDE) personnel have been qualified and certified in accordance with their employer's written practice prior to performing or evaluating radiographic or ultrasonic examinations required by this Section. SNT-TC-1A[29] or CP-189 shall be used as a guideline for employers to establish their written practice. National or international Central Certification Programs, such as the ASNT Central Certification Program (ACCP), may be used to fulfill the examination and demonstration requirements of the employer's written practice. Provisions for training, experience, qualification, and certification of NDE personnel shall be described in the Manufacturer's quality control system (see PG-105.4).

PW-50.2 NDE personnel shall be qualified by examination. Qualification of NDE Level III personnel certified prior to the 2004 Edition of Section I may be based on demonstrated ability, achievement, education, and experience. Such qualification shall be specifically addressed in the written practice. When NDE personnel have been certified in accordance with a written practice based on an edition of SNT-TC-1A or CP-189 earlier than that referenced in A-360, their certification shall be valid until their next scheduled recertification.

PW-50.3 Recertification shall be in accordance with the employer's written practice based on the edition of SNT-TC-1A or CP-189 referenced in A-360. Recertification may be based on evidence of continued satisfactory performance or by reexamination(s) deemed necessary by the employer.

Figure 4. ASME Section 1, 2013 edition

Although there is no reference to specific central certification programmes other than ACCP[14], these amendments allow the use of national or international central certification programmes, such as those complying with ISO 9712,

to fulfil the examination requirements of the employer's written practice, which must be in accordance with SNT-TC-1A[7] or ANSI/ASNT CP-189[13].

In Code Case N-788 'Third-Party NDE Certification Organizations, Section XI, Division 1', approved 9 April 2010, Section XI defined the requirements for third-party certification organisations, which may be used *in lieu* of employer-based certification of Level 2 and 3 NDE personnel. Specific requirements (on QA to USA standards and training) were defined over and above those implicit in ISO 9712 certification. However, the 2014 edition does not reference ISO 9712 and is quite specific about the written practice, which must be prepared in accordance with ANSI/ASNT CP-189.

Following work by a group known as the ASME NDE Exploratory Group, Section V of the code has been modified to reference ISO 9712:2012-based programmes. The wording of the relevant part of ASME Section V 2013 edition is reproduced in Figure 5.

(e) For those documents that directly reference this Article for the qualification of NDE personnel, the qualification shall be in accordance with their employer's written practice which must be in accordance with one of the following documents:

(1) SNT-TC-1A,[3] Personnel Qualification and Certification in Nondestructive Testing; or

(2) ANSI/ASNT CP-189,[3] ASNT Standard for Qualification and Certification of Nondestructive Testing Personnel

(f) National or international central certification programs, such as the ASNT Central Certification Program (ACCP) or ISO 9712:2012-based programs, may be alternatively used to fulfill the training, experience, and examination requirements of the documents listed in (e) as specified in the employer's written practice.

(g) When the referencing Code Section does not specify qualifications or does not reference directly Article 1 of this Section, qualification may simply involve a personnel demonstration to show that the personnel performing the nondestructive examinations are competent to do so in accordance with the Manufacturer's established procedures.

(h) The user of this Article is responsible for the qualification and certification of NDE Personnel in accordance with the requirements of this Article. The Code User's[4] Quality Program shall stipulate how this is to be accomplished. Qualifications in accordance with a prior edition of SNT-TC-1A, or CP-189 are valid until recertification. Recertification or new certification shall be in accordance with the edition of SNT-TC-1A or CP-189 specified in Footnote. [3]

(i) Limited certification of nondestructive examination *personnel who do not perform all of the operations of a* nondestructive method that consists of more than one operation, or who perform nondestructive examinations of limited scope, may be based on fewer hours of training and experience than recommended in SNT-TC-1A or

Figure 5. Article 1 Para T-120 of ASME Section V

It is hoped that the application sections of the Code will dispense with their own requirements for personnel qualification and certification and reference Section V instead.

It is notable that ICNDT's recommendations in this Guide are consistent with the key principles of ASME code requirements:

- an employer's written practice is required;
- NDT personnel shall be qualified by examination;
- the employer retains responsibility.

Employers working to ASME codes who choose to follow this option now prepare a written practice (based on the recommendations of SNT-TC-1A/CP189), which references certification in accordance with third-party/central schemes that comply with ISO 9712. A reference to CP-106[15] would also meet the specified requirement.

Employers must specify the additional training and examinations that are necessary to provide a bridge between the scheme's training and examinations and the specific ASME NDT procedures and/or specific employer's needs (for example for the application of TOFD or phased arrays).

Appendix 5: Non-destructive testing under the European Pressure Equipment Directive (97/23/EC)

Introduction

The Pressure Equipment Directive – 97/23/EC[13] – was formally adopted by the European Parliament and Council on 29 May 1997 and was published in the Official Journal of the European Communities, No L181, on 9 July (ISBN 011 916 0927). It came into force on 29 November 1999 and compliance with its requirements has been mandatory since 29 May 2002.

The purpose of the directive is to harmonise national laws regarding the design, manufacture and conformity assessment of pressure equipment and assemblies (vessels, storage containers, heat exchangers, shell and water tube boilers, industrial pipework, safety devices and pressure accessories), subject to an internal pressure greater than 0.5 bar above atmospheric.

Equipment is categorised within four levels (I to IV) according to the degree of hazard: category III and IV equipment will require conformity assessment by 'notified bodies' and 'recognised third-party organisations'.

Non-destructive testing

For pressure equipment, non-destructive tests of permanent joints must be carried out by 'suitably qualified personnel'. For pressure equipment in categories III and IV, NDT personnel must be approved by a 'recognised third-party organisation' (RTPO) recognised by a member state pursuant to Article 13.

ISO 9712 has been adopted without any change in Europe as EN ISO 9712 and the relationship between the Directive and ISO 9712 can only be in the context of the EN version of the standard, *ie* EN ISO 9712. This means that any use of the standard ISO 9712 for assessing compliance to the requirements of the EU Directive shall be done by reference to EN ISO 9712.

An informative Annex ZA is included in EN ISO 9712, which states: 'This European standard has been prepared under a mandate given to CEN by the European Commission and the European Free Trade Association to provide a means of conforming to essential requirements of the new approach directive (97/23/EC) (PED)'.

Once this European standard is cited in the Official Journal of the European Communities under that directive and has been implemented as a national standard in at least one member state, compliance with the clauses of this standard given in Table ZA.1 of Annex ZA confers, within the limits of the scope of this European standard, a presumption of conformity with the corresponding essential requirements of that directive and associated EFTA regulations. Table ZA.1 shows the relationship between EN ISO 9712 and Directive 97/23/EC by reference to specific clauses of the standard.

Certificates of competence in compliance with EN ISO 9712:2012 issued by a recognised third-party organisation (RTPO) and covering the testing of permanent joints (in effect, welds) are presumed to satisfy the requirements of the directive because EN ISO 9712 is a harmonised standard. But there are alternative acceptable methods of fulfilling the requirements of the directive, as detailed in CEN/TR 15589[16] (Non-destructive testing – Code of Practice for the approval of NDT personnel by recognised third-party organisations under the provisions of Directive 97/23/EC).

Appendix 6: Certification schemes compliant with ISO 9712

The Table on the following pages summarises information from NDT societies on personnel certification bodies offering ISO 9712 certification, as known at the time of writing. The Table will be updated as further information becomes available and the latest version can be found on the ICNDT website at http://bit.ly/1n2Ml3i

The following notes expand references in the Table, shown in square brackets thus [1].

1. Accreditation and ICNDT Registration: Inclusion on 'ICNDT MRA 2' in this column shows that the certification body is registered under Schedule 2 of the ICNDT Multilateral Recognition Agreement – see Appendix 7.
2. (Australian Institute) ISO 9712 since 1992
3. (British Institute) Also an RTPO for PED
4. (Bulgarian Society) ISO 9712 and ISO 20807 from 2006, ISO 18436-2 commencement from 2008, EN 4179 from 2008 (General)
5. (TUV Rheinland Bulgaria Ltd) VCMD out of accreditation
6. (Croatian Society) Accredited from 09/2004
7. (Czech Republic) Czech Society for NDT is not a certification body in Czech Republic, but participates in the work and is a member of its certification body – Association for Personnel Certification (APC)
8. (COFREND) Also RTPO for PED
9. (German Society) Also RTPO for PED
10. (Indian Society) ISO 9001 Quality Manual, ISNT recognised as NSO of ASNT. Also collaborates with other certification bodies
11. (Japanese Society) ISO 9712 from 2003
12. (Norwegian and Swedish Societies) Certification not done by the Society – claes.eriksson@ndttraining.se
13. (Russian Society) Additionally in Russia have several independent NDT personnel certification bodies that annually issue up to 10,000 certificates on different methods
14. (Singapore Society) NDTSS revamped the certification and expected to gain accreditation from SAC
15. (South African Institute) The Institute does not operate a certification system (this is provided for South Africa by the Southern African Institute of Welding). The South African Institute of NDT is represented on the SAQCC system scheme committee.
16. (Southern African Institute of Welding) ISO 9712 from 2003
17. (Vietnam Association) ISO 9712 from 2006

Certification body	Scheme	Management system	Certification standard(s)	Accreditation and ICNDT registration [1]	Methods covered	No of certifications		Commencement of certification
						People	Method	
American Society for Nondestructive Testing, Inc (ASNT)	ASNT NDT Level III	ISO 17024	Recommended Practice SNT-TC-1A	ANSI	MT, PT, RT, UT, VT, ET, AE, LM, LT, NR, IR	6533	18,539	03/1977
	ASNT NDT Level II	ISO 17024	Recommended Practice SNT-TC-1A	In process by ANSI	MT, PT, RT, UT, VT	48	69	10/10/2013
	ACCP Level II	ISO 17024	ANSI/ASNT CP-106 (US adoption of ISO 9712:2005)	ANSI	MT, PT, RT, UT, VT	1800	2132	1997
	ACCP Level III	ISO 17024	ANSI/ASNT CP-106 (US adoption of ISO 9712:2005)	ANSI	MT, PT, RT, UT, VT	972	2828	1997
	IRRSP	ISO 17024	10 CFR 34 Appendix A SSRCR Part E	ANSI	Radiation Safety Certification	3222	3241	1998
Australian Institute for NDT	AINDT	ISO 17024	ISO 9712, ISO 20807, PED	JAS-ANZ ICNDT MRA 2	UT, RT, MT, PT, ET, TT	1971	3620	2006[2]
Austrian Society for NDT	ÖGfZP	ISO 17024	ISO 9712, PED	BmiFWuA	UT, RT, MT, PT, VT, ET, LT, IR	3040	7151	06/1993
Belgian Association for NDT		ISO 17024	EN 473	COFRAC	UT, RT, ET, MT, PT			
Brazilian Society for NDT	SNQC	ISO 17024	ISO 9712	INMETRO	UT, PT, MT, VT, RT, AT	17,384	27,000	03/93
British Institute of NDT	PCN[3]	ISO 17024 ISO 17021	ISO 9712, ISO 18436, ISO 20807, ISO 10256, ISO 11484, EN 4179	UKAS ICNDT MRA 2	AE, ET, IRT, LM, MT, PT, RT, UT, VA, VT, PA, TOFD, CRI	17,571	36,764	1985
Bulgarian Society for NDT	BG S NDT	ISO 17024	EN 473, ISO 9712, ISO 18436-2, EN 4179, ISO 20807	BAS[4]	ET, LT, MT, PT, RT, UT, VT, TT, AE, VCMD	390	1069	04/10/2001
Personnel Certification Body with TÜV Rheinland Bulgaria Ltd	TUV RB	ISO 17024	BDS EN ISO 9712, ISO 18436[5]	BAS	RT, PT, MT, UT, ET, VT, VCMD[5]	280	1104	2002
Canadian Institute for NDE	CINDE	ISO 17024	ISO 9712, ISO 20807		PT, MT, ET, UT, RT	5400	12,420	1960 (Junior/Senior) 1979 (Three Levels)
Chinese Society for NDT	ChSNDT	ISO 17024	ISO 9712, EN 473	CMFS	MT, PT, UT, RT	24,552	37,208	01/07
Croation Society for NDT	CrSNDT	ISO 17024	ISO 9712, PED	HAA[6]	UT, RT, MT, PT, VT, ET	645	1181 valid	1964
Association for Personnel Certification APC (Czech Republic)[7]	Std 101 APC Std 201 APC Std 301 APC	ISO 17024	ISO 9712, ISO 11484	CAI	UT, RT, MT, PT, VT, ET, LT, VTP, UTT, ETT, ZMJ, ZMS, NZS, TT, AI (AT from 2010)		9495	1999

Certification body	Scheme	Management system	Certification standard(s)	Accreditation and ICNDT registration [1]	Methods covered	No of certifications		Commencement of certification
						People	Method	
Inspecta Sertifiointi Oy, Finland	Nordtest	ISO 17024	ISO 9712, PED, ISO 18436.2	FINAS ICNDT MRA 2	ET, LT, MT, PT, RT, UT, VT, VMO, TLA	902 +49 (CM)	2347 +49 (CM)	1978
COFREND [8]		ISO 17024	ISO 9712, EN 4179	COFRAC	UT, RT, MT, PT, VT, ET, TLT, AT, IT, ST	13,508	23,514	1978
German Society for NDT	DPZ [9]	ISO 17024	ISO 9712	DakkS	AT, ET, LT, MT, PT, RT (incl RI, DRT, TT, UT (incl TOFD, PA), VT	13,114	40,698	1988
Hellenic Society of NDT	HSNT	ISO 17024	ISO 9712	ESYD	MT, PT, UT, RT, RI, VT	76	124	2005
Indian Society for NDT	ISNT	ISO 17024 [12]	IS 13805, ISO 9712	No	RT, PT, MT, UT, ET, IR, VT, NRT, AE		>25,000	
Israeli National Society for NDT	ISRANDT	ISO 17024	ISO 9712	Yes	RT, UT, PT, MT, ET	25	4	2001
Italian Society for NDT								
The Japanese Society for NDI	JSNDI	ISO 17024	JIS Z 2305 (ISO 9712 MOD) [11]	No	ET, MT, PT, RT, SM, UT	47,574	88,336	1968
The Korean Society for NDT	KPCN	ISO 17024	ISO 9712:2012	In progress KAB	RT, UT, MT, PT, VT, ET	0	0	2013
Norwegian NDT Society	[12]							
Portugal	Relacre	ISO 17024	ISO 9712:2012	IPAC ICNDT MRA2				
The Russian Society for NDI	RSNTTD Voluntary Scheme [13]	ISO 17024	ISO 9712		MT, ET, PT, UT, RT, VT, AT, IT, Thermal Testing, Vibration Analysis	>300	588	2003
Research-training centre "Testing and Diagnostics" (Russia)		ISO 17024	ISO 9712:2012, PED	UKAS ICNDT MRA 2	RT, PT, MT, UT, ET, VT, AE	5326	7128	1994
NDT Society (Singapore)	SGNDT	ISO 17024	ISO 9712:2012	NO [14]	RT, UT, MT, PT, VT, ET	8	8	2008
South African Institute of NDT	[15]							
Southern African Institute of Welding	SAQCC	ISO 17024	ISO 9712	SANAS [16]	MT, PT, RT, UT, ET, VT	2152	3639	2003

Certification body	Scheme	Management system	Certification standard(s)	Accreditation and ICNDT registration [1]	Methods covered	No of certifications		Commencement of certification
						People	Method	
Swedish Society for NDT	[2]							
Spain – AEND	CERTIAEND	ISO 17024	ISO 9712	ENAC	VT, PT, MT, ET, UT, RT, LT	3524	7059	1997
Ukraine	UkrSRINDT	ISO 17024	ISO 9712:2012	Nat accred Agency of Ukraine ICNDT MRA2				
Vietnam Association for NDT	VANDT	ISO 17024	ISO 9712[3]	No	VT, PT, UT, RT	450	180	2008

Appendix 7: ICNDT Multilateral Recognition Agreement, PCB assessment scheme and examination question bank

During the NDT week in Croatia, 7-11 October 2013 at the Certification 2013 Conference, three key initiatives to aid harmonisation and recognition of personnel certification globally were launched. These are:

- The ICNDT Multilateral Recognition Agreement (MRA);
- The ICNDT personnel certification body conformity assessment (PCBA); and
- The ICNDT examination question bank (EQB).

These developments were included in the ICNDT Strategic Plan and have been completed by the Certification Executive Committee and the ICNDT Executive, with the strong support of the CEC secretariat.

The ICNDT Multilateral Recognition Agreement (MRA)

Under the MRA ICNDT members sign the agreement and agree to commit to the pursuance of the objectives of the MRA:

- promote the recognition and acceptance of the certification issued by PCBs registered under the MRA;
- assist other interested parties by giving a clear overview of the NDT personnel certification activities in its own country;
- provide other parties with non-confidential information on the certification scheme(s) operated by PCB registered under this Agreement;
- consult with and seek membership of the scheme and technical committees of NDT PCBs in its own country and
- indemnify ICNDT against liability for the party's use or misuse of this MRA.

Details are in the ICNDT Operating Procedure OP19. The ICNDT MRA builds directly on successful experience in EFNDT with a similar agreement since 1994 and the Board of EFNDT has recommended that its member societies should now participate in the ICNDT MRA. This will bring wider recognition of the certification provided by PCBs than is provided under the EFNDT MRA. At the time of writing, thirty ICNDT member societies* from Europe, Asia Pacific and Pan-America have signed the agreement. The list of current signatories is published on the ICNDT website (MRA Schedule 1).

The first PCB to apply for recognition (Ukraine: The Ukrainian Scientific Research Institute for NDT (UkrSRINDT)) was registered by ICNDT and several other registrations have been processed: including RELACRE (Portugal), RTC "Testing and Diagnostics" (Russia), Urząd Dozoru Technicznego Jednostka Certyfikująca Osoby (Poland), Inspecta Sertifiointi Oy (Finland), BINDT PCN (UK) and AINDT (Australia). The current list of registered certification bodies is published on the ICNDT website (MRA Schedule 2).

Other related initiatives on certification

ICNDT is continuing with other complementary actions to further strengthen the proper use of third-party certification and ISO 9712:

- Update of this ICNDT Guide – which explains how third-party certification to ISO 9712 can be properly embedded in a company system/written practice;
- Actions led by WG1 to document and compare how different PCBs are implementing the new ISO 9712 as a step towards better understanding and promotion of best practice.

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*Australia, Austria, Brazil, Bulgaria, Canada, China, Croatia, Czech Republic, Finland, France, Germany, India, Israel, Italy, Japan, Malaysia, Netherlands, Poland, Portugal, Romania, Russia, Serbia, Singapore, South Africa (SAINT & SAIW), South Korea, Spain, Switzerland, Ukraine and UK.

The ICNDT personnel certification body conformity assessment (PCBA)

The PCBA offers a route to conformity assessment *versus* ISO 17024 and ISO 9712 likely to be of value where accreditation is difficult or does not meet the requirements of the MRA. Details are given in ICNDT Operating Procedure OP20.

The ICNDT examination question bank (EQB)

The ICNDT examination question bank will be an important platform for harmonisation. It is available in English and Spanish with improved management software. There are 7000+ selected questions at three levels (*L1, L2, and L3*) in seven methods complying with ISO/TR 25107[18] (plus radiation safety and TOFD). The questions are classified by industrial sector and can be combined for multi-sector examinations.

What are the benefits?

- Enable national bodies to share effort in generating suitable questions and so reduce the burden on each body;
- Help harmonise standards by ensuring national bodies around the world are using a similar quality of questions;
- Enable the generation of a higher quality of examination paper by increasing the number of questions from which those used on a particular paper can be selected;
- Help to make examinations more rigorous by enabling participating bodies to ensure that their papers more evenly cover the required bodies of knowledge for a particular subject;
- Satisfy the EN ISO IEC requirement for fairness, validity and reliability in qualification examinations.

Who has access to the question bank?

- Personnel certification bodies nominated by an ICNDT *member;*
- Who have signed or commit to sign the ICNDT Multilateral Recognition Agreement; and
- Have agreed to meet the requirement for security of the data in the Examination Question Bank.

What methods and sectors are covered?

- Radiation safety: General;
- Materials Science: Multi-sector;
- Time of Flight Diffraction: Welds;
- Visual Testing: In-Service Inspection, General;
- Magnetic Particle Testing: In-Service Inspection, General;
- Penetrant Testing: In-Service Inspection, General
- Eddy Current Testing: Aerospace, General, In-Service Inspection, Tubes, Welds, Wrought products;
- Radiographic Testing: Aerospace, Castings, General, In-Service Inspection, Welds;
- Ultrasonic Testing: Aerospace, Castings, General, In-Service Inspection, Welds, Wrought products.

What is the application capable of?

- Generating question papers manually or automatically;
- Selection options for sector, method, level and difficulty;
- Each paper has a unique reference and is permanently archived;
- Input form for adding further questions;
- Data outputs for statistical analysis.

Appendix 8: Qualification of NDT personnel in accordance with ISO 20807 and ISO TS 11774

Introduction

ISO 9712 establishes the general requirements for the qualification and certification of personnel for a wide range of competencies defined by the application of NDT methods to products, such as castings, forgings and welded constructions used in specified industry sectors.

In certain circumstances it may be necessary or desirable, for economic or safety reasons, to qualify NDT personnel for specified limited applications, and the two documents referred to in this Appendix provide a framework for such qualification activities.

ISO 20807 (Non-destructive testing – Qualification of personnel for limited applications of non-destructive testing)

International standard ISO 20807[12] establishes a system for the qualification of personnel who perform NDT applications of a limited, repetitive or automated nature, such as:

- eddy current and electromagnetic sorting of materials;
- eddy current and electromagnetic testing of tubular products during manufacture;
- normal beam ultrasonic testing of plate materials during manufacture;
- ultrasonic thickness measurement.

As a provision outside the scope of ISO 9712 requirements, limited NDT is the practice of a test method for a particular application requiring specific training and experience, *ie* an application that is limited, repetitive or automated. Annex A to ISO 20807 serves to provide examples of syllabuses for the training and examination of personnel seeking qualification to this international standard.

The methodology set out in ISO 20807 may be applied to the qualification of personnel for any limited application of NDT. However, it is not intended that qualification for limited applications be substituted for qualification and certification under ISO 9712, which includes provision for a reduction in the duration of training and experience required for eligibility in limited applications.

ISO TS 11774 (Non-destructive testing – Performance-based qualification)

The technical specification ISO TS 11774[13] has the scope to provide a method for qualification of non-destructive testing personnel, procedures and equipment for specific NDT conducted in accordance with documented procedures to achieve a required level of performance.

Implementation will require cooperation between applicable industry sector committees (ISCs) and qualification bodies to assure that specific performance expectations are addressed.

The qualification methodology described is based upon the candidate's ability to demonstrate capability in detecting and sizing critical discontinuities equivalent to those to be detected and sized in the performance-based qualification programme as established by the ISC.

Second-party (employer-based) qualification and approval (for example in accordance with ANSI/ASNT CP-189[10]), or qualification and third-party certification (for example in accordance with ISO 9712), followed by on-the-job training, may not provide the required degree of confidence for safety-critical inspections and this technical specification provides criteria to assist in preparing an individual for performance-based qualification examinations.

Qualification to this ISO TS is limited to specific applications, using the specific documented procedure in the performance-based qualification programme.

Process

The NDT procedure shall first be qualified and the personnel qualification is valid only when the essential parameters are applied and controlled as defined within the procedure. The procedure qualification shall demonstrate the capability to resolve mandatory detectable discontinuities under representative conditions.

The candidates shall provide evidence of current valid NDT Level 2 or 3 certification in the method for which he or she is to be qualified. For NDT Level 2 personnel, the certification may be from a nationally recognised employer-based programme or a certification body accepted by the ICS. For NDT Level 3 personnel, the certification shall be from a certification body.

Candidates for qualification shall have sufficient training and specific practical experience to ensure they are capable of performing non-destructive tests using the qualified NDT procedure. The experience may be obtained with the use of virtual training systems, or by examining representative specimens, with relevant and non-relevant discontinuities that may be located in a laboratory, or analysing recorded data from automatic, digital or analogue systems.

The discontinuities in the specimens that the candidates shall report may be actual or simulated and shall range in size from the minimum detectable using a qualified procedure to not more than the maximum size specified.

The qualification body shall be responsible for the administration and grading of examinations and shall appoint the NDT qualification examiner.

Periodic performance demonstration. The frequency and content of periodic performance demonstration shall be determined by the ISC.

The ISO TS 11774 process is represented in flowchart form in Figure 6.

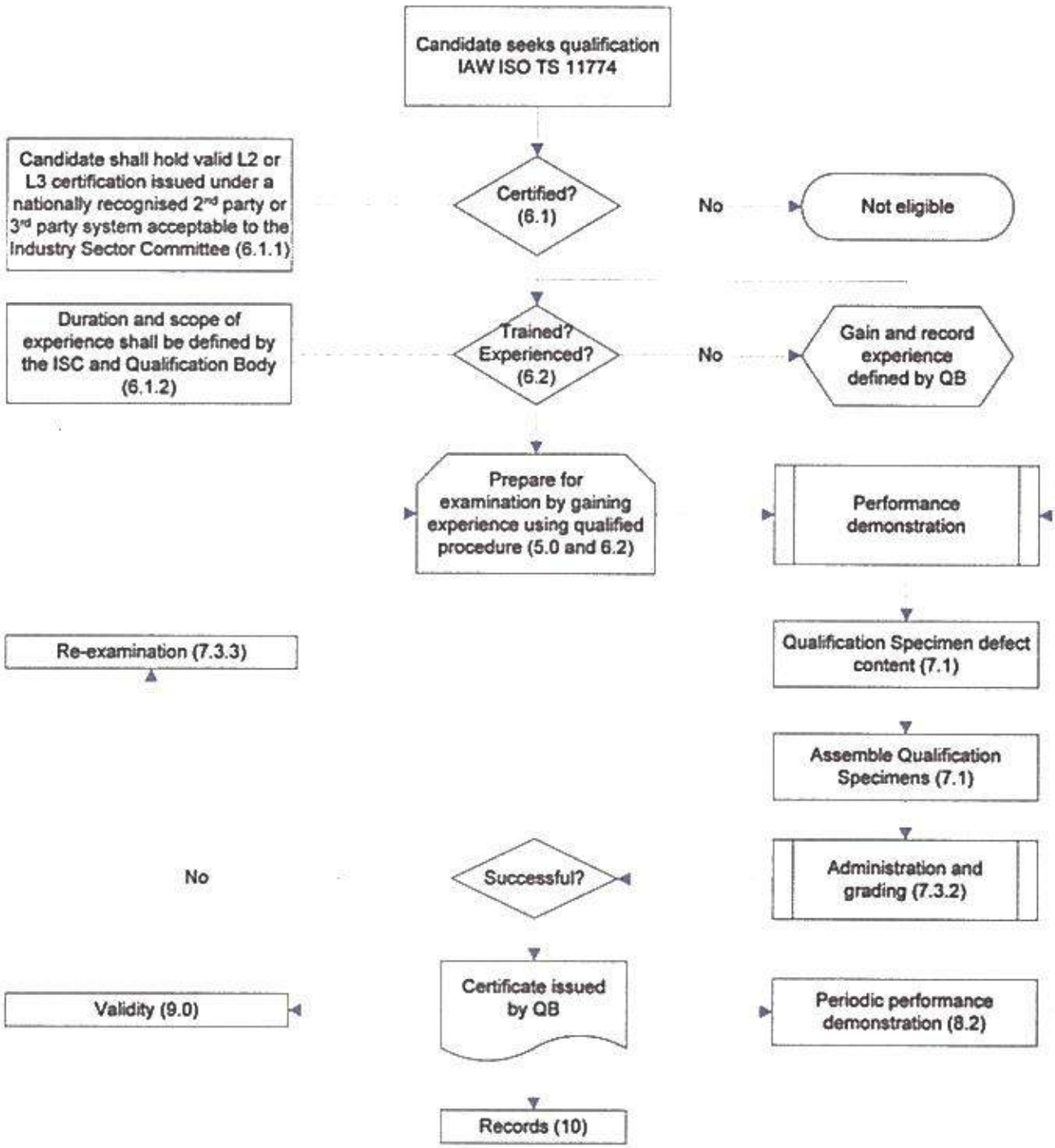

Figure 6. The ISO TS 11774 process

Appendix 9: Guidance for developing countries seeking to establish national certification schemes

Background

This guidance has been developed by ICNDT in response to Action Plan 3, Action A5: "Provide guidance for developing countries seeking to establish national certification schemes – listing merits of co-operation with established CBs".

Preamble

1. It is clearly not practical for every single PCB to offer every category of certification (method, sector, etc).
2. NDT societies in developing countries considering setting up their own certification schemes face a major task and a long period of time before they can offer a full range of certification and further major hurdles in achieving recognition.
3. On the other hand, management of a national PCB is often a route to some authority and influence for an NDT society in its own country.
4. Some qualification and certification organisations offer training and examinations outside their home countries, using several different models:
   - ASNT offers examinations for Level 3 in numerous different countries around the world, through international authorised examination centres (Germany, Egypt, Malaysia and UK) and national sponsoring organisations, which are mainly NDT societies, including ChSNDT, ISNT and KSNT. There are other special examination sponsors in a further seven countries.
   - PCN (the certification body of BINDT) offers PCN examinations through a number of authorised qualification bodies in the UK and abroad. Some of the UK-based AQBs themselves offer examinations abroad (in Greece, Hong Kong, Kazakhstan, Malaysia, Qatar, UAE, USA) and external AQBs have been set up in Australia, China, India, Netherlands and Singapore.
   - Research and Training Centre Moscow, an accredited certification body, offers examinations in Russia and also in India and Ukraine through its AQBs there.

Guidance

National NDT societies seeking to establish national certification schemes are recommended to consider seeking cooperation with an existing certification body as an alternative or complementary approach. This does not preclude setting up a local PCB.

NDT societies and/or PCBs which are operating outside their own home country are encouraged to cooperate closely with the national NDT society where they wish to operate. In practice, this should be achieved by means of a signed agreement between the parties. Possible areas of collaboration are:

- External PCBs should seek to accept local certification and training as an entry level to their examinations
- Agreement on language for examinations
- Recognition of local meetings and activities in points schemes for renewal/recertification.

When there is a disagreement, the matter should be referred to ICNDT for mediation.

Appendix 10: Code of practice for personnel certification bodies

NDT personnel certification bodies (PCBs) seeking ICNDT approval and/or registration under the ICNDT Multilateral Agreement on Recognition of Certification are obliged to sign an undertaking to comply with this Code of Practice. *Inter alia*, they shall:

1. Maintain compliance with the standard(s) and specification(s) detailed on their certificate of accreditation or the ICNDT certificate of conformity, notifying the ICNDT Certification Executive Committee (ICEC) of any change in status, or in the standards with which the certification scheme that they operate to complies;
2. Promote recognition and acceptance in their own country of the certificates of conformance issued by other NDT PCBs registered under the ICNDT MRA;
3. Keep confidential all examination material, including examination questions and specimens, in secure conditions with strictly controlled access only to authorised individuals;
4. Conduct their business in a responsible manner and utilise fair and equitable practices in dealing with clients and candidates;
5. Perform their professional duties with proper regard for the physical environment and the safety, health and well-being of certificate holders and candidates for certification;
6. Protect to the fullest extent possible, consistent with the wellbeing of the public and the provisions of this CoP, any information given to them in confidence by an employer of certificated NDT personnel, candidates and certificate holders, or members of the public;
7. Avoid conflicts of interest with employers of certificated NDT personnel or candidates, but when unavoidable, forthwith disclose the circumstances to the employer or candidate;
8. Not falsify nor permit misrepresentation of their accreditation, ICNDT certificate of conformity or certificate of registration under the ICNDT MRA;
9. Refrain from making unjustified statements or from performing unethical acts that would discredit the NDT profession or the ICNDT;
10. Immediately report to the ICEC any perceived violation(s) of this Code of Practice by any party;
11. Accept the right of the ICNDT, and provide unhindered access to a nominated representative of the ICNDT, to investigate any alleged infringements of this Code of Practice;
12. Indemnify ICNDT against liability for the PCB's use or misuse of the ICNDT MRA and/or PCB CA systems, which are administered as a series of signed agreements under the jurisdiction of Austrian law.

Appendix 11: ICNDT tabulation of PCB's implementation of ISO 9712:2012

ICNDT has invited personnel certification bodies to tabulate clause by clause how they implement ISO 9712 in order that users of certification and other stakeholders may see how the various options and freedoms are interpreted. The information is presented in an Excel spreadsheet with the clauses listed row by row and each PCB having its own column. Cells are coloured yellow to indicate 'complies with the standard', green to indicate 'exceeds the minimum requirements of the standard' and, exceptionally, red for 'does not comply'. Due to the size of the spreadsheet it is not presented here, but it can be accessed on the ICNDT website at http://bit.ly/1k6YUQ1. The document on the website will be modified as more information becomes available.

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Newton Building, St George's Avenue, Northampton NN2 6JB, UK.
Tel: +44 (0)1604 89 3811 | Fax: +44 (0)1604 89 3861 | Email: info@bindt.org | Web: www.bindt.org

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