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**GLOBAL REVIEW OF QUALIFICATION AND CERTIFICATION OF
PERSONNEL FOR NDT & CONDITION MONITORING**

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ABSTRACT

Published and draft international and regional standards - and some significant national standards - covering the certification of competence of NDT and Condition Monitoring personnel are already in use at national, regional or international level.

Each of the standards referenced below aims to satisfy the needs of geo-political regions for independent third party or interested second party certification of NDT personnel (at least one, ISO 11484, addresses both 2nd and 3rd party systems) in general or specific industry sectors.

This paper provides an overview of the status of national, regional and international standards related to qualification and certification of personnel engaged in non-destructive testing, condition monitoring, diagnostics and material evaluation;

- § discusses problems and solutions concerning implementation of certain standards, particularly in respect of sectors covered by European regulations, and
- § presents the current situation regarding global arrangements for mutual recognition and acceptance of personnel certification, including those activities of various supra-national bodies, such as ICNDT and EFNDT, to foster harmonization of qualification and certification.

STANDARDISATION

There are now a number of published international and regional standards - and some significant national standards that are used world-wide (see “references”) - covering the certification of competence of personnel. Each of the standards referenced below aims to satisfy the needs of geo-political regions for independent third party or interested second party certification of personnel engaged in inspection and testing (at least one, ISO 11484, addresses both 2nd and 3rd party systems) in general or specific industry sectors. The following is a summary of relevant personnel qualification and certification standards:

ISO 9712 (Non-Destructive Testing - Qualification and Certification of Personnel) was originally developed at the request of the ICNDT by ISO Technical Committee 135 Sub Committee 7 (ISO/TC135/SC7), and was issued in 1991 in order to provide an international standard, which would have the effect of harmonizing the certification of NDT personnel throughout the world. ISO 9712 was the first international standard specifying independent (central) certification. The second edition of the standard was published early in 2000, and a third edition was published in April 2005.

EN 473 (Qualification and certification of NDT personnel - General Principles) was developed by a CEN Technical Committee (CEN/TC138) specifically for the European Union in order to provide a more stringent set of requirements than ISO 9712 (which allowed, in its first edition, up to fifteen years for countries adopting the standard to implement all of its provisions). The second edition of this standard was published in October 2000. EN473 is a ‘*harmonized standard*’ in the context of the European Pressure Equipment Directive (97/23/EC), and is therefore enshrined within the law of the EU. EN 473:2000 is presently under review, and is likely to be published as a third edition in 2007 Or 2008.

ISO 11484:1994 (Steel tubes for pressure purposes - qualification and certification of

non-destructive testing (NDT) personnel) was developed specifically to provide for the needs of the manufacturers of steel tubes where testing is usually carried out using automated systems which, once set up, require minimal NDT skills to operate. It was not considered appropriate, by the ISO member representatives of the industry concerned, to apply the provisions of ISO 9712 to levels 1 and 2 personnel in this industry, but ISO 11484 does cater for both 2nd and 3rd party certification.

ISO 20807: 2003 (Qualification of personnel for limited application of non-destructive testing). Limited NDT is defined within this standard as “the implementation of a test method for a particular application requiring specific training and experience, i.e., an application which is limited, repetitive or automated”. Annex A of the standard serves to provide examples of syllabi for the training and examination of personnel seeking qualification to this International Standard.

EN 10256:2000 (Non-destructive testing of steel tubes - qualification and competence of level 1 and 2 non-destructive testing personnel) was developed by the European Committee for Iron and Steel Standardization (ECISS) for similar reasons to those that led to the development of the international standard ISO 10256; the industry utilizes a high proportion of automated testing and it was considered that the application of EN 473 would lead to over qualification of operators.

EN 4179:2005 (Aerospace series - qualification and approval of personnel for non-destructive testing). The original standard was developed by the Association of European Aerospace Manufacturers (AECMA) to suit the particular needs of their industry, which were not felt to be adequately served by EN 473. This industry sector uses a range of sometimes very esoteric NDT techniques, often automated and computerised, which it was considered would be beyond the scope of independent certification examinations. Added to this, there was a need to harmonise the certification of personnel employed in the European aerospace industry with the requirements of MIL-STD-410 (now AIA-

NAS-410) since this standard is often specified in contractual arrangements with US manufacturers. EN4179 and NAS410 are at this time partially merged into one specification, which is published as European standard EN 4179:2005. Work on a further revision, which will completely merge the European and North American standards, is ongoing, and is expected to be completed within 2 years.

ISO/IEC 17024 (General requirements for bodies operating certification systems of persons) was published in 2003, and International Accreditation Forum (IAF) guidance on the implementation by certification and accreditation bodies of ISO/IEC 17024 was published as G24 in 2004. The standard replaces EN 45013 (1989 General criteria for certification bodies operating certification of personnel), which has been formally withdrawn. The requirements of the new standard are far more appropriate than those of the superseded EN 45013, which was originally based upon EN 45012 (General criteria for certification bodies operating *certification of quality systems*). All accredited certification bodies are now fully applying ISO/IEC 17024, and it is expected that this will become a major contributor to harmonization of qualification and certification of NDT personnel.

STANDARDS DEVELOPMENT

ISO/TC135/SC7/WG7 has been formed to develop an international standard covering qualification of NDT personnel through performance based assessment of competence. This project follows numerous round robin trials that have demonstrated a deficiency in the current approach to qualification and certification of NDT personnel.

ISO/TC135/SC7/WG8 has been formed to develop specifications for discontinuities in examination specimens. This follows on from a Technical report issued by CEN (prTS 15053 - Recommendations for discontinuity types in test specimens for examination) that covers the same scope. The resulting ISO document is intended to be a Technical Specification which, unlike a Technical Report, contains mandatory compliance criteria, and may be elevated to a standard.

prEN 473 : 2006 – NOTABLE CONTENT AND FEATURES

The process of reviewing and revising EN 473 to a third edition is in progress and, at the time of submission of this paper, prEN 473 : 2000 Revision, finalized during the CEN/TC 138 meeting held on 2006-07-03/04, has been submitted to CEN/CMC for authorization to circulate for a 5 months enquiry. CEN/TC138 is undertaking this work with a view to submitting the resulting standard to ISO for adoption under the Vienna Agreement as an international standard.

Normative references include:

1. [EN ISO/IEC 17024 : 2003](#), Conformity assessment – General requirements for bodies operating certification of persons.
2. [CEN/TR 14748](#) : 2004, non- destructive testing – methodology for qualification of non destructive tests
3. [CEN/TS 15053](#) : 2006, Non-destructive testing – Recommendations for discontinuities-types in test specimens for examination
4. [CEN/TR 00138123](#) : 2006, 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.
5. [CEN ISO/TR 25107](#) : 2006, Non destructive testing – Guidelines for NDT training syllabuses.
6. [CEN ISO/TR 25108](#) : 2006, Non destructive testing – Guidelines for NDT personnel training organisations.

Ref. [1] is now the internationally specified standard for personnel certification bodies, and is universally applied in accreditation systems operated by International Accreditation Forum (IAF) members.

Ref. [2] has been developed from the European Network for Inspection Qualification (ENIQ) version – which was specific to nuclear applications – to provide a more general methodology. The scope of the prEN 473 states: “The system described in this European Standard can also apply to other NDT methods provided a comprehensive scheme of certification exists and the method

is covered by European, international or national, standards (see CEN/TR 14748 Table 1)”. This TR details how to go about qualifying personnel, procedures and equipment for critical applications of NDT, and the systems described within are in effect applying performance demonstration protocols (see previous ISO/TC137/SC7/WG7 work item). As a Technical Report (TR), this document provides guidelines and, even though it is a normative reference within prEN 473, the fact that it provides guidance allows some latitude. It is understood that this TR is referenced so that, in the event that a certification body uses the principles of EN 473 to qualify and certify personnel for the application of a non-standard method/technique, or for a new inspection technology, there is guidance on how to qualify the equipment and procedure prior to qualifying the personnel.

Ref. [3] was developed under both CEN and ISO to provide a specification for discontinuities-types in test specimens, thus providing a further means of harmonizing the qualification process.

Ref. [4] is included in recognition of the fact that the European Pressure Equipment Directive (97-23-EC) failed to provide detailed guidance on how Notified Bodies would go about ‘approving’ NDT personnel to carry out NDT of permanent joints (welds) in pressure equipment. The methodology contained within the referenced document recognises that assessment of personnel can take place within the workplace, and that approvals can be issued by a NB on the strength of EN 473/ISO 9712 certificates of competence issued by other certification bodies. This system has been widely applied by, for example, the British Institute of NDT, which has arrangements with Canada and Australia under which NDT personnel holding certification issued by NRCAN and AINDT are ‘approved’ by BINDT – a Notified Body.

Ref. [5] provides detailed NDT training syllabuses, with recommended classroom training times. However, the sum of these times would result in a *significant* increase over and above the times presently stipulated in EN 473 : 2000 and ISO 9712 : 2005, so

there has been some discussion about reducing these within the standard (see later comment).

Ref. [6] provides detailed guidelines for NDT personnel training organisations, including management, quality systems, student induction, facilities, equipment, specimens, technical library, staff qualifications and training, and training records. The draft standards states: “*If the training is realized by a training organisation, it is recommended that the NDT personnel training organisations follow the guidelines given in CEN ISO/TR 25108*”. Some certification bodies, such as BINDT, have already put in place systems for assessing and accrediting training organisations against the criteria contained within this TR.

Training durations

prEN 473 is more prescriptive in that it *requires* that the CB cascade down to the candidate a requirement to have completed training (prior to certification – not examination) which is in accordance with TR 25107 (a TR provides *guidance*).

The *minimum* hours of training required by ISO 9712 and prEN 473 are significantly different, as can be seen from the table below.

NDT Method	L1 hrs 9712 (473)	L2 hrs 9712 (473)	L3 hrs 9712 (473)
AT	40 (40)	104 (80)	150 (120)
ET	40 (40)	104 (80)	150 (120)
MT	16 (16)	40 (40)	60 (72)
PT	16 (16)	40 (40)	60 (64)
RT	40 (72)	120 (152)	160 (224)
UT	40 (72)	120 (152)	160 (224)
VT	16 (16)	40 (40)	64 (104)

In this table, the requirements of ISO 9712:2005 and prEN 473 have been presented in the same format, i.e., the total required hours for each level are shown, and they do not need to be added. This allows direct comparison.

This represents the first instance of potential difficulty (or impossibility) in complying simultaneously with both standards.

Industrial NDT experience

The prEN 473 states: “A minimum period of experience prior to examination shall be defined by certification body (a fraction of x% of the total requirement of the tables 3 or 4 as appropriate) In the event that a part of the experience is sought following successful examination, the results of the examination shall remain valid for only one year”.

As can be seen, prEN 473 introduces the concept of a minimum period of experience before examination to be defined by the certification body (see below). *But note that the CB may define x = 0% !*

ISO 9712 and prEN 473 requirements for experience at Levels 1 and 2 are more or less identical, but ISO 9712 simplified the presentation of experience requirements and significantly changed the experience required before Level 3 certification. The two standards are quite different in this area.

This represents the second instance of potential difficulty (or impossibility) in complying simultaneously with both standards.

Vision testing

prEN 473 introduces the requirement to detect contrast between shades of grey.

Re-examination (of failed examinations)

There is a significant difference between the two standards with respect to the period allowed between failure and re-examination. ISO 9712 : 2005 allows “A candidate who fails to obtain the pass grade required for certification to be re-examined in any of the examination parts twice, provided that the re-examinations take place not sooner than 30 days after a previous examination and not later than five years after the original examination”. prEN 473 on the other hand allows that “A candidate who fails to obtain the pass grade for any examination part (general, specific or practical), may be re-examined once in the failed part(s), provided that the re-examination takes place not sooner than one month, unless further training acceptable to the certification body

is satisfactorily completed, nor later than twelve months after the original examination”.

Recertification

prEN 473 allows that, “in the case of operators carrying out repetitive testing in sectors dealing with mass production, the following procedure* may be used instead of a conventional recertification examination administered by the CB; this alternative route will only allow recertification with a limited scope as defined by the certification body in an approved certification scheme.

* [the candidate shall] “*Successfully demonstrate, during an audit conducted in the work place by the Certification Body with the employer’s written consent, continued competence in the work performed. The audit shall be carried out by an examiner authorised and appointed by the Certification Body and shall comprise the witnessing of the satisfactory implementation by the certificate holder of a range of tasks covering the scope of the certificate. The examiner shall produce a fully documented report with recommendations regarding limitation of the scope of certification. The extent and scope of the recertification shall be determined by the Certification Body based on this report”.*

Some key differences highlighted above are sufficient to make simultaneous compliance with both ISO 9712 : 2005 and prEN 473 actually or nearly impossible.

CONDITION MONITORING PERSONNEL CERTIFICATION

ISO/TC 108/SC5 is developing a suite of standards covering the qualification and certification of personnel engaged in Condition Monitoring. Mainly concerned with monitoring machinery, the standard also embraces Infrared Thermography, and this also deals with civil engineering and electrical/electronic systems. ISO 18436 has a number of parts (some of which are already published, with others in various stages of drafting):

- Part 1: General requirements
- Part 2: Vibration Analysis (published)

- Part 3: Accreditation of Certification Bodies (published)
- Part 4: Lubrication Management and Analysis
- Part 5: Thermography
- Part 6: Diagnostics and Prognostics
- Part 7: Condition Monitoring Specialists

The British Institute of NDT has, through the PCN Scheme, implemented condition monitoring personnel certification at three levels for each of the Vibration Analysis, Lubrication Management and Analysis, Acoustic Emission and Infrared Thermography (in civil engineering, electrical engineering and machinery applications).

NDT TRAINING

CEN/TC138 ad-hoc group 4 and ISO/TC135 WG2, both under the convenership of the CEN/TC138 Chairman, have drafted the following Technical Reports:

CEN ISO/TR 25108 : 2006, Non-destructive testing – Guidelines for NDT personnel training organisations.

This Technical Report provides guidance for training organizations in terms of Management, QMS, student induction and assessment, facilities, NDT equipment, technical library, training staff and records to be maintained. This is a useful publication, and is highly recommended for use by those certification bodies that assess and approve training organizations preparing candidates for ISO 9712 qualification examinations.

CEN ISO/TR 25107 : 2006, Non destructive testing – Guidelines for NDT training syllabuses.

This Technical Report provides recommendations for detailed training syllabuses at three levels covering RT, UT, ET, MT, PT, LT, AT and VT.

These documents are the product of 2 years work in ISO/TC135 and CEN/TC138 working groups to promote harmonization of the minimum training requirements of the different existing certification schemes. The content of this first edition has been based on the experience of the participating experts and

comments of the end-user industries. The time allotment for the different topics takes into account the latest developments in each method and consequently the total duration can be sometime greater than the minimum duration required by ISO 9712 and EN 473.

Also noteworthy is the fact that these two specifications are normative references in CD prEN473 : 2006, but that ISO 9712:2005 *does not* make reference to CEN ISO/TR 25107 : 2006. The ISO standard refers to IAEA-TECDOC-628/Rev.1:2002, *Training Guidelines in Non-destructive Testing Techniques*, published by INIS Clearinghouse, International Atomic Energy Agency.

ICNDT

The International Committee on NDT is today seeking to establish for itself a wider and more meaningful role in the international NDT community, and it has recently set up the *ICNDT NDT Qualification and Certification Committee* with the following objectives:

- (i) To provide a focal point for ICNDT's activities in Qualification and Certification of NDT, working in co-operation with the Regional NDT Committees;
- (ii) To promote international harmonisation in compliance with International Standards (including nomination of ICNDT representation on ISO Committees);
- (iii) To promote mutual recognition of Certification.
- (iv) To organise information of NDT Qualification and Certification on the ICNDT Website.
- (v) To oversee the preparation of documents/guidelines etc. (e.g. ICNDT Recommended Guidelines on NDT Qualification and Certification according to ISO 9712) for publication on the ICNDT Website.

The Committee Chairman is nominated by the ICNDT Executive Committee, and the members will be invited by the ICNDT

Executive Committee, chosen to ensure a geographical spread of interested parties.

Meetings will be held as required, supplemented by e-mail correspondence.

EFNDT

The European Federation for NDT (EFNDT) was formed in 1999 from the members of the previous European Council for NDT (ECNDT).

The purpose of the Federation is to promote all aspects of non-destructive testing including the technology, research, development application, training and information in all countries within the geographical area of Europe, according to the UN definitions and to initiate any actions likely to improve its quality and reliability.

The EFNDT has established itself as a legal entity, thus creating the opportunity to raise funds from its members and activities in order to undertake various projects for the wider benefit of the NDT community at large (there are already over thirty members of the EFNDT). The EFNDT has two committees concerned with Qualification and Certification of NDT Personnel:

The EFNDT Certification Executive Committee (CEC) has six members: one nominee from each of the three Founding Societies [BINDT, COFREND and DGZfP], and three further members appointed by the EFNDT Board of Directors. All CEC Members are appointed for a period of three years, and are eligible for re-appointment. The CEC is set up to:

- Execute the policy of the EFNDT in the field of certification.
- *Approve* certification bodies against the criteria set out in document EFNDT/P/05-001 (such approval being seen as an alternative to accreditation – where no national accreditation system exists).
- Monitor and direct the CEC Secretariat in processing applications for and awarding licenses for the use of the EFNDT examination question bank.
- Negotiate mutual recognition and acceptance of certification issued by

approved certification bodies, including the management and administration of the EFNDT Multilateral Recognition Agreement (MRA).

The EFNDT Forum on NDT Accreditation, Qualification and Certification (FAQC), which was previously known as the Working Group on Qualification and Certification (referred to as WGC or Working Group 1), has been given new terms of reference in keeping with its new identity. The FAQC is set up to consider and formulate recommendations to the Board of Directors (BoD) on EFNDT policy and objectives the areas of:

- criteria for registration under the EFNDT Multilateral Recognition Agreement (MRA);
- liaison with other regional MRA for NDT personnel certification;
- promoting acceptance of the certificates of competence issued by accredited certification schemes registered under the EFNDT MRA.
- codes, standards and specifications related directly or indirectly to NDT;
- NDT laboratory assessment and accreditation;
- NDT personnel certification body assessment and accreditation;
- Co-operation with European Accreditation of Certification (EAC) and the International Accreditation Forum (IAF) on matters relating to non-destructive testing, including laboratory accreditation and accreditation of NDT personnel certification bodies;
- interpretation of ISO 9001 : 2000 criteria for NDT service vendors;
- qualification of NDT equipment, procedures and NDT personnel;
- Interfacing with established authorities and bodies involved with and having an

interest in equipment and inspection qualification;

- promoting and improving quality and reliability in Non-Destructive Testing generally.

Participation in the FAQC is open to all Full and Associate Member NDT Societies of the EFNDT, and each Member of the EFNDT may nominate one official representative to attend an FAQC meeting. Other NDT Societies and Certification Bodies not in current membership of EFNDT may be invited by the FAQC Chairman to attend meetings with Observer status. The Chairman and Secretary of the FAQC are appointed by the Board of Directors of the EFNDT (for the time being, the Chairman and Secretary are provided by the British Institute of NDT).

ASME

ASME Code requirements for NDT personnel have been revised following recent code case enquiries to reference ASNT ACCP central certification specifically, and to ISO 9712 implicitly. Centrally certificated NDT personnel may now satisfy certain ASME code requirements, provided the employing organization operates a procedure or written practice that covers the employment and authorization of such personnel.

ASME has recently published Section V, [Article 14](#) (qualification of personnel, equipment and NDT procedures). The methodology set out in this Article involves the evaluation of general, technical, and performance-based evidence presented within a documented technical justification, and when required, a blind or non-blind performance demonstration. It also provides good information on statistical analysis concerning Probability of Detection. A very useful document!

THE EUROPEAN PRESSURE EQUIPMENT DIRECTIVE (PED)

Within the Directive, Pressure Equipment is categorised at four levels (I to VI) according to degree of hazard: category III and IV equipment, with potentially the greatest hazard, requires that NDT personnel testing

permanent joints (welds) will require approval by 'notified bodies'. So, what does 'approval' mean? The directive itself does not call for EN 473 certification of NDT personnel, but the following harmonized standards do:

EN 13480: part 5 - Inspection and testing - clause 8.4.3 (Personnel qualifications). Personnel performing tests shall be qualified and certified in accordance with EN 473 for the appropriate testing method (this requirement is repeated in clauses 8.5 to 8.9 which cover NDT methods VT, MT, PT, RT and UT).

EN13445 part 5 - Inspection and testing - clause 6.1.3.5.7 (Qualification of NDT personnel): NDT personnel shall be qualified and certified in accordance with EN 473 except for visual examination and leak testing (for which personnel shall be qualified but not certified).

The NDT personnel approval requirements of the PED have been addressed quite differently at the national levels in Europe, where most (but not all!) Recognized Third Party Organisations (RTPO), the Notified Bodies that are authorised to approve NDT personnel, have been appointed on the basis of compliance with ISO/IEC 17024.

NDT personnel holding EN 473 certification in relevant sectors (welds, castings, wrought products, forgings, pipes, pre and in-service inspection and metal manufacturing) are automatically '*approved*' under the PED – so long as the certification body that issued the certification has been 'notified' as a RTPO. However, except where EN 473 is invoked within the terms of a harmonized standard (e.g., EN 13480 or 13445), EN 473 certification is *not* mandatory to satisfy the provisions of the PED.

NDT personnel qualified within a 2nd party system, such as SNT-TC-1A, can be '*approved*' by a RTPO under a code of practice proposed by the EFNDT, which was taken up and modified by the EU Conformity Assessment Bodies Forum (CABF) before being passed to CEN TC 138 for publication as CEN/TR 00138123 : 2006, 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.

Annex 1 serves to illustrate the processes for approving NDT personnel under CEN/TR 00138123 : 2006, which has been incorporated as a normative reference in CD/prEN 473 : 2006.

EASA AND EN 4179 (AEROSPACE SECTOR NDT QUALIFICATION)

The European Aviation Safety Agency (EASA) superseded the Joint Aviation Agency in September 2003 and, as the new European civil aviation regulator, is taking over the roles of the respective national aviation safety authorities of European Union member states. EASA publishes two regulations of interest to the NDT fraternity:

§ EASA Part 21 regulation covers the provision of NDT in the civil aviation manufacturing sector, and recognizes the qualification and certification of NDT personnel in both second party, e.g., AIA-NAS-410, and third party arrangements, e.g., EN 473.

§ EASA Part 145 regulation covers the provision of NDT in service and specifies compliance with EN 4179 for the qualification and ‘approval’ of NDT personnel.

Although EN 4179:2000 is specified by EASA part 145, this is almost universally ignored since industry has adopted AECMA standard prEN 4170:2003, which represents a fusion of EN 4179 with NAS-410, prEN 4179 places responsibility for controlling NDT qualification examinations upon National Aerospace NDT Boards. prEN 4179 : 2003 has now been published as EN 4170 : 2005, and a strawman version of a combined ASA-NAS-410 and EN 4179 is already in circulation!

National Aerospace NDT Boards (NANDTB) are presently being widely constituted throughout Europe to address the airworthiness requirements of EASA regulations (especially parts 21 and 145) and EN 4179. NANDTB have the responsibility of controlling all NDT qualification examinations, including those conducted by

the employer and central certification bodies. The status of development of EU member states’ Aerospace NDT Boards (believed correct at 31 May 2006) is shown in the following table:

Footnote

A meeting of representatives of the various National Aerospace NDT Boards was held during the 9th European Conference on NDT on Friday 29th September.

Each Board wishing to participate was requested to nominate not more than two representatives to attend the meeting. Countries which do not presently have a Board established were also invited to attend. One or more representatives from EASA were invited to attend the meeting as observers, though this status was not intended to limit their participation in any way.

The main purpose of the meeting was to discuss whether to formally establish a Forum for NANDTB under the umbrella of the European Federation for NDT with the following aims and objectives in relation to EASA regulations part 145, part 21 and EN 4179:

- provide a forum for discussion of matters of common interest to all NANDTB;
- harmonisation of methodology for the control of aerospace NDT training and EN 4179 qualification examinations provided at the various national levels;
- provide formal representation of the common concerns of the ANDTB members to EASA
- act as an advisory body for new NANDTB implementing applicable regulations and standards,
- agree common specifications for outside agencies providing training and qualification examinations at the various national levels;
- agree and promote a common format for company written practices in conformance with EN 4179
- provide a mechanism for interpretation, adjudication and arbitration in cases of

dispute regarding the implementation of applicable regulations and standards.

The ANDTBF will probably establish arrangements for multilateral recognition between its members, with North American organisations having similar aims, and with any other pertinent body in order to benefit the Aerospace industry and to minimise duplication and multiple audit.

In order to obtain the widest possible representation, the ANDTBF is likely to encourage NANDTB or similar organisations outside of the European Union and Free Trade area to apply for membership or otherwise to seek involvement in its activities.

Topics suggested for discussion at future meetings are:

From Australia:

- There is a need for a guideline document or similar which could be used by NANDTBs when requested to recognise another. It may be workable in Europe to have all the European Boards cooperating within a forum or similar, but for those Boards outside of such an arrangement which seek mutual recognition there needs to be a consistent and realistic approach.

From Scandinavia:

- Grandfathers rights. The Commission Regulation (EC) No 2042/2003 Article 4 §3 give operators already qualified the right to carry out NDT even after the regulation came into force. It would be interesting to know how this has been interpreted amongst the member states. Especially if some time limit is connected

to such a Grandfathers Right e.g. the expiration date of the present certification.

- Economy of NANDTB. It would be of interest to screen the existing NANDTBs with regard to the financial funding of their activities like meetings, administration, home page, audit of training organisations, approvals etc.
- EN4179:2005 Experience requirements. EN4179:2005 Table 2 Note a) indicates a reduction of the requirements for experience. How is this note being interpreted amongst different NANDTBs? Would this e.g. mean that the experience requirement is reduced to 50% when the candidate already has a certification in any other method?
- EASA AMC 145 update. EASA AMC 145.A.30 (f) is today referencing EN:4179:2000 which has been superseded by EN 4179:2005. What are EASAs intentions and timescale regarding updating to reference EN 4179:2005?
- Equivalent certification e.g. EN 473 Aerospace sector. It could be assumed that several of the NANDTBs have had to evaluate other certification schemes for equivalency. It would be interesting to know how the NANDTBs have evaluated e.g. the EN 473 Aerospace sector certification.

BIBLIOGRAPHY

Standards and guidelines covering qualification and certification of non-destructive testing and condition monitoring personnel

AIA-NAS-410	2002 Aerospace Industries Association national Aerospace Standard for qualification and certification of non-destructive testing personnel
ANSI-CP-189	1995 ANSI/ASNT standard for qualification and certification of non-destructive testing personnel
ANSI-CP-189	2006 (DRAFT for comment) standard for qualification and certification of non-destructive testing personnel
EN 10256	2000 (white draft) Non-destructive testing of steel tubes - qualification and competence of level 1 and 2 non-destructive testing personnel
EN 4179	2005 Aerospace series - qualification and approval of personnel for non-destructive testing
EN 45013	1989 General criteria for certification bodies operating certification of personnel (WITHDRAWN)
EN 473	2000 Qualification and certification of NDT personnel - General Principles (2 nd edition)
PrEN 473	2006 Qualification and certification of NDT personnel - General Principles (Draft 3 rd edition)
ISO 11484	1994 Steel tubes for pressure purposes - qualification and certification of non-destructive testing (NDT) personnel
ISO 9712	2005 (3 rd edition) Non-Destructive Testing - Qualification and Certification of Personnel
ISO 18436	Condition monitoring and diagnostics of machines – Accreditation of organisations and training and certification of specialists
ISO 20807	2003 Qualification of personnel for limited application of non-destructive testing
ISO/IEC 17024	General requirements for bodies operating certification systems of persons
SNT-TC-1A	2001 ASNT recommended practice for the qualification and certification of non-destructive testing personnel (Periodically reviewed and republished by the American Society for NDT)
CEN/TR 00138123	2006, 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

Codes and Regulations

97/23/EC	European Pressure Equipment Directive - published in the Official journal of the European Communities No. L181 of 9th July (ISBN 011 916 0927)
ASME Section V	(1998 edition A99) Article 1 : General Requirements, T-140 : Requirements (98 A99), sub paragraph (b) (Requirements for NDE Personnel)
ASME Section VIII	Welded Vessels, UW-51 (98), sub paragraph (a) (2) (Qualification and Certification of NDE Personnel)

Training guidelines for the qualification of non-destructive testing personnel

TECDOC-628 :	1991 Training Guidelines in Non-destructive testing Techniques Published by the International Atomic Energy Agency, Wagrammerstrasse 5, P. O. Box 100, A-1400 Vienna, Austria.
CR ISO TR 25107	Non-destructive testing - Guidelines for NDT training syllabuses
CR ISO TR 25108	Non destructive testing - Guidelines for NDT personnel training organisations
ANSIASNT-CP-105	2006 (DRAFT for comment) Topical outlines for qualification of NDT personnel

ANNEX 1 – ROUTES TO APPROVAL OF NDT PERSONNEL TO SATISFY THE EU PED

