

2005-07-15

Via E-mail

Dear Patricia,

The CGSB Committee on Non-destructive Testing and Certification of Personnel met in Calgary on April 12, 2005 and voted to have a formal ballot on adopting, without modifications, ISO 9712:2005 as the new National Standard of Canada.

However, ISO 9712:2005 has changed requirements for training and experience and allows the certification body latitude in these areas. Several CGSB Committee members stated that they wanted to know just what degree of 'latitude' would be applied by NRCan in the implementation of the Canadian adoption of ISO 9712:2005 - the 'rules of implementation'. They wanted to have this information before they vote on adopting, without modifications, ISO 9712:2005 as the new National Standard of Canada.

I have attached 15 rules of implementation that were forged in later discussion and communication with NRCan Level 3 examiners, the members of the NDT Advisory Committee to MTL (50% Level 3s) and several training organizations such as CINDE, SAIT, NAIT, etc. These are the rules they suggest and NRCan is prepared to implement these rules.

I suggest that it would be useful to distribute these 'rules of implementation' to the members of the CGSB NDT Personnel Committee before or with the voting ballot.

Thank you for your patience,

Respectfully,

Dr. Richard V. Murphy

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NRCan Implementation of ISO 9712:2005

June 21, 2005 – R.V. Murphy

Setting the 'Latitude' in Training/Experience

The CGSB Committee on Non-destructive Testing and Certification of Personnel met in Calgary on April 12, 2005 and voted to have a formal ballot on adopting, without modifications, ISO 9712:2005 as the new National Standard of Canada. However, ISO 9712:2005 has changed requirements for training and experience and allows the certification body latitude in these areas. ISO 9712:2005 states in the Introduction, "Where latitude is provided in the criteria within this International Standard, the certification body has the final decision in determining specific requirements." So, several CGSB Committee members wanted to know just what degree of 'latitude' would be applied by NRCan in the implementation of the Canadian adoption of ISO 9712:2005 - the 'rules of implementation'. Obviously, this could affect the members' vote for or against an adoption without modifications.

The NDT Advisory Committee met on April 13, 2005, the day after the CGSB Committee meeting, and reviewed the new training and experience provisions of ISO 9712:2005. The Committee reviewed written suggestions from five NRCan Level 3 technical staff (April 01-04, 2005) and discussed the issues from many different points of view (industry and training organizations). The NDT Advisory Committee recommended that the 'latitude' be fixed and that the 'rules of implementation' be published on the NRCan web site. After the meeting, the Advisory Committee and several training organizations reviewed the proposed rules, made adjustments, added new rules for foreign training/experience/certification and agreed to the 15 rules of implementation that are presented below.

The following is the list of 15 rules* for NRCan implementation of a Canadian adoption of ISO 9712:2005.

* A detailed explanation of how most of these rules were established is presented after the list of rules.

1. NRCan will set up a procedure for NRCan accreditation of training organizations, the training courses and the trainers (course instructors).
2. NRCan will publish on the Certifying Agency web site a list of all NRCan accredited training organizations, training courses and trainers (course instructors).
3. On an ongoing basis, NRCan will provide to the accredited training organizations the average pass rate of their candidates.
4. NRCan will require that training certificates issued to candidates by the accredited training organization state:
 - The method, level, and duration of the course.
 - That the course duration complies with the requirements of CAN/CGSB-48.9712-2005.
 - That the course and course examination followed the IAEA Techdoc 628 and NRCan curricula.
 - That the candidate was in full time attendance for ____ hours.
 - The grade ($\geq 70\%$) obtained by the candidate on the course test.
 - The name of the course trainer (instructor)
5. Prerequisite Math Skills and Materials/Process Knowledge
 - a. NRCan accredited training organizations will be responsible for producing a math-skill test. An applicant for training must pass ($\geq 70\%$) the math test before being allowed to attend training courses in materials and processes or in the NDT methods. The grade obtained on the math-skill test will be provided by the accredited training organization to NRCan.
 - b. NRCan accredited training organizations will be responsible for preparing and delivering a 40-hour course (that includes a test) in materials and processes. Applicants must pass ($\geq 70\%$) the materials and processes test before being allowed to attend training courses in the NDT methods. The grade obtained on the materials and processes test will be provided by the accredited training organization to NRCan.
 - c. If an applicant can provide, to the NRCan accredited training organization, evidence of sufficient prior training in materials and processes, the training organization may omit the 40-hour course requirement if the applicant can demonstrate competence by passing ($\geq 70\%$) the materials and processes test. The grade obtained on the materials and processes test will be provided by the accredited training organization to NRCan.

6. There will be no reductions in training for higher education.
7. NRCan will perform a more detailed assessment of candidates' claimed industrial experience at all levels of certification. Candidates will report experience using a new three-part NRCan form that requires information on their industrial experience as a trainee, as a Level 1 and as a Level 2.

Trainee Experience: A check-sheet listing basic equipment used and types of inspections performed. A candidate for Level 1 certification must report his method experience as a trainee.

Level 1 Experience: A detailed listing of equipment used, reporting of experience by dated inspections performed. Experience must meet minimums for Level 2, Table 2 note f (work as Level 1). A candidate for Level 2 must report his method experience both as a trainee and as a Level 1.

Level 2 Experience: A comprehensive listing of equipment used, detailed reporting of experience by dated inspections performed. Experience must meet minimums for Level 3, Table 2 note g (work as Level 2). A candidate for Level 3 must report his method experience as a trainee, as a Level 1 and as a Level 2.

8. Attestations of experience are required at all Levels.
 - **Supervisor:** On the revised application form, each level of reported experience (trainee, Level 1 and Level 2) must be attested to in writing by the employee's supervisor at the time the candidate gained the claimed experience.
 - **Sponsor:** A sponsor (CGSB certified Level 2 or 3) must co-sign the attestation of the various levels of experience.
 - **25% Verification:** NRCan will verify the claimed experience of 25% of applicants.
 - **Invigilator comments:** The claimed experience will be weighed against invigilator comments on the practical examination.
 - **Questionable experience:** If the experience claimed is questionable, NRCan will verify the claimed experience with the trainer (course instructor).
9. There will be no reduction in experience based upon the 'quality of experience'.
10. The practical-workshop time that will be accepted as equivalent industrial experience will be limited to:
 - 2 days maximum for the surface methods (MT, PT, ST, VT), equivalent to ~3 weeks experience.
 - 5 days maximum for the volumetric methods (AT, ET, IT, LT, RT, UT), equivalent to ~7 weeks experience.
11. There will be no reduction in experience for 'quality of education'.
12. In general, there will be no experience reduction/increase for experience gained in another sector of the same method. In the case of endorsements to existing-method certifications, the certification body may establish additional training and experience requirements.
13. There will be no experience reduction for simultaneous experience in different methods.
14. Foreign candidates
 - a. Training: A foreign candidate, claiming previous training, will be directed to an accredited training organization of his choice, where he must pass the training organization's tests for:
 - i) Basic Math
 - ii) Materials & processes, and
 - iii) NDT method(s).NRCan will accept as proof of adequate prior training, a certificate issued by the accredited training organization stating that the candidate had passed these tests (I, ii, iii).
Note: The candidate does not have to take the training courses - just the tests. The candidate gets one try at the tests. In the event that the candidate cannot pass the tests, the candidate must take the necessary training course(s) appropriate to pass each of the tests.

NRCan will treat both national and foreign candidates the same way. All must produce a certificate from an NRCan accredited training organization stating the candidate has passed the training organizations test for basic math, the test for materials and processes and all tests pertaining the NDT methods/levels in which he/she seeks certification.

- b. Experience: A foreign candidate, claiming previous experience, will be required to meet the same requirements as at items 7 and 8. In cases where the experience is questionable and/or difficult to verify (previous supervisors reside in a foreign country, sponsor not available), NRCan will assess the submitted claims of experience under item 7 and consider the comments of the accredited trainers and invigilators of the practical examinations.
- c. Certification: NRCan will assess the submitted claims of certification of a foreign candidate. His certifications may be acceptable proof of prior training and experience and NRCan may allow him to proceed to full or partial examination. On the other hand, the foreign candidate may be required to demonstrate training and experience as per item 14 a.) and b.).

15. Transition rules

The current rules under CAN/CGSB-48.9712-2000 are clear. The new rules to apply under a Canadian adoption of ISO 9712:2005 are clear. What about during the transition from the old to the new Standard?

- a. We apply the old (and these transitional rules) for training and experience up to two years from date of original application for multiple methods - subject to c. below.
- b. As soon as the CGSB Committee approves ISO 9712:2005 for adoption as the new Canadian Standard, we apply the new rules.
- c. A candidate for certification will be considered "in process of certification" only if he has already successfully completed at least one examination in the method(s) and level(s) in which he sought certification.

Detailed explanation of how the rules were established.

The list of rules for NRCan implementation of a Canadian adoption of ISO 9712:2005 was presented above. This section will be of interest to those persons seeking more details as to why and how these rules came about.

TRAINING REQUIREMENTS – reproduced from ISO 9712:2005

7.3 Training

7.3.1 The candidate for Level 1 and Level 2 certification shall provide documentary evidence, in a form acceptable to the certification body, that training in the method and level for which the certification is sought has been satisfactorily completed, *in accordance with the certification body's requirements*.

7.3.2 Taking into account the scientific and technical potential of candidates for Level 3 certification, preparation for qualification may be done in different ways: by attending training courses, conferences or seminars, studying books, periodicals, and other specialized printed or electronic materials. Regardless of the manner of preparation, the Level 3 candidate shall submit documentary evidence of appropriate training *in a form acceptable to the certification body*.

7.3.3 The minimum duration of training undertaken by the candidate for certification shall be in accordance with Table 1 for the applicable NDT method. See [1] and [2] in the Bibliography for guidance on training-course content.

Table 1 — Minimum Training Requirements

| NDT Method | Level 1 h | Level 2 Total, h (inclusive of Level 1) | Level 3 Total, h (inclusive of Level 2) |
|------------|-----------------------|---|---|
| AT | 40 | 104 | 150 |
| ET | 40 | 104 | 150 |
| TT | 40 | 120 | 160 |
| LT | A - Basic knowledge | 8 | 36 |
| | B - Pressure method | 14 | 66 |
| | C - Tracer gas method | 18 | 78 |
| MT | 16 | 40 | 60 |
| PT | 16 | 40 | 60 |
| RT | 40 | 120 | 160 |
| ST | 16 | 40 | 60 |
| UT | 40 | 120 | 160 |
| VT | 16 | 40 | 64 |

Training hours are based upon candidates possessing basic mathematical skills and prior knowledge of materials and processes. If not the case, additional training *may be required by the certification body*.

Training hours include both practical and theory courses.

Training duration may be reduced by up to 50% when the certification sought is limited in application of the method.

A reduction of up to 50% in the total required number of training hours *may be accepted by the certification body* for candidates who have graduated from technical college or university, or have completed at least two years of engineering or science study at college or university.

TRAINING - RULES OF IMPLEMENTATION – NDT Advisory Committee

1. NRCan Accreditation of Training Organizations, Validation of Training Courses, Accreditation of Course Instructors

In order to satisfy the requirements of 7.3.1 and 7.3.2, NRCan will set up a procedure for the accreditation of training organizations, their training courses and course instructors.

Rational: Training organizations need to be controlled. According to John Moore (SAIT), there are too many 'Fly by Night' or 'XYZ Training will Travel' trainers appearing that are producing candidates who are ill prepared for NRCan examination. While companies may provide specialized training for their employees, the basic CGSB Standard training requirements must be properly handled through audits and accreditation of the training organizations. This approach is promoted and supported by Alison Smit and Doug Marshall (CINDE) and Doug Whitely (trainer for CINDE). NRCan accreditation will provide a level-playing field for the provision of quality training through standardized procedures and processes. Such accreditation must encompass the Quality Triad: the organization, the course and the trainer. The trainer must be certified under the Canadian Standard in the method that he is teaching in accordance with the provisions 6.3.1 h) and j) and 6.4.1 e) and f) of ISO 9712:2005.

6.3 Level 2

6.3.1 An individual certified to Level 2 shall have demonstrated competence to perform non-destructive testing according to established procedures. Within the scope of the competence defined on the certificate, Level 2 personnel may be authorized by the employer to:

- h) carry out and supervise all tasks at or below Level 2,
- i) provide guidance for personnel at or below Level 2,

6.4 Level 3

6.4.1 An individual certified to Level 3 shall have demonstrated competence to perform and direct non-destructive testing operations for which he is certified. Within the scope of the competence defined on the certificate, an individual certified to Level 3 may be authorized by the employer to:

- e) carry out and supervise all tasks at all levels, and
- f) provide guidance for personnel at all levels.

2. NRCan will publish on the Web a list of all accredited training organizations, courses and trainers.

This will permit persons seeking training to find a list of all acceptable training organizations, courses and trainers.

3. NRCan will provide to the accredited training organizations the average pass rate of their candidates.

This feedback will enable and encourage training organizations to improve their training courses and methods of instruction. In cases where the pass rate falls below an acceptable level and cannot be raised, NRCan will no longer list the training organization/course as acceptable to NRCan.

4. 'Satisfactory Completion' of Training

Reference: 7.3.1, 7.3.2 and 7.3.3 – reproduced above.

The candidate is required to show that training was "satisfactorily completed" and to submit "documentary evidence" of appropriate training "in a form acceptable to the certification body". Therefore, NRCan will require that training certificates issued to candidates by the accredited training organization state:

- The method _____, level _____, and duration _____ of the course.
- That the course duration complies with the requirements of CAN/CGSB-48.9712-2005.
- That the course and course examination followed the IAEA Techdoc 628 and NRCan curricula.
- That the candidate was in full time attendance for _____ hours.
- The grade _____ ($\geq 70\%$) the candidate obtained on the course examination.
- The name of the course trainer (instructor)

5. Prerequisite Math Skills and Materials/Process Knowledge

Reference: Table 1 — Minimum Training Requirements

Note 1: "Training hours are based upon candidates possessing basic mathematical skills and prior knowledge of materials and processes. If not the case, additional training may be required by the certification body."

a) Math Skills

Accredited training organizations will be responsible for producing a math-skill test. An applicant for training must pass ($\geq 70\%$) their math test before being allowed to attend training courses in materials and processes or in the NDT methods. The grade obtained on the math-skill test will be provided by the accredited training organization to NRCan.

Rational: Persons who attend NDT method training without basic-math skills cannot understand nor perform basic mathematical calculations that are essential to the NDT method. The instructor may be required to stop NDT-method training in order to provide basic-math training even to show how to operate a calculator. This slows down the entire class and time is taken away from training in the NDT method. The idea of requiring grade-12 math or high-school graduation was considered to be no guarantee of mathematical competence. The best assessment tool was deemed to be a math test. Discussion amongst the Advisory Committee indicated that the accredited training organizations, not the certification body, were the ones best positioned to provide a test of basic-math skills. NRCan would provide test guidelines and the accredited training organizations would produce their own math-skill test.

b) Materials-Processes Knowledge (M&P)

Accredited training organizations will be responsible for preparing and delivering a 40-hour course (that includes a test) in materials and processes. Applicants must pass ($\geq 70\%$) the materials and processes test before being allowed to attend training courses in the NDT methods. The grade obtained on the materials and processes test will be provided by the accredited training organization to NRCan.

If an applicant can provide, to the accredited training organization, evidence of sufficient prior training in materials and processes, the training organization may omit the 40-hour course requirement if the applicant can demonstrate competence by passing ($\geq 70\%$) the materials and processes test. The test grade will be provided by the accredited training organization to NRCan.

Rational: At the start of a recent CINDE training session for 40+ persons seeking Level 3, only 1 person passed the CINDE Level 2 materials and process test. Knowledge of materials and processes is considered fundamental to the understanding and application of all NDT methods. Yet, there is little time available during NDT method training to teach in-depth materials and processes. This training must be a pre-requisite to NDT method training. The Advisory Committee suggested that a 40-hour course would be sufficient. The training organizations and NRCan would collectively develop the curriculum. NRCan would then issue a standard curriculum to be used by all accredited training organizations to prepare their 40-hour M&P courses.

6. No Reduction of Training for Higher Level of Education

Reference: Table 1 — Minimum Training Requirements

Note 4: "A reduction of up to 50% in the total required number of training hours may be accepted by the certification body for candidates who have graduated from technical college or university, or have completed at least two years of engineering or science study at college or university."

The NDT Advisory Committee felt that higher education in a technical field such as science or engineering would better prepare the candidate in the areas of math skills and possibly in the knowledge of materials, processes and flaws. However, Note 1 of Table 1 now requires mathematical skills and knowledge of materials and process as prerequisites to the training hours shown in Table 1. Thus, the NDT Advisory Committee felt that Note 1 negates most the applicable training advantage that might be gained by higher education.

Thus, major reductions (up to 50%) for higher level of education could not be justified.

- a) For the surface methods (MT, PT), a reduction of 0% to 10% was considered reasonable.
- b) For volumetric methods (RT, UT, ET), a reduction of 0% to 25% was considered reasonable.

However, the logistics, to enable training organizations to offer training courses of varying duration, shorter than shown in Table 1, were considered unfeasible. There will be no reductions in training for higher education.

EXPERIENCE REQUIREMENTS – reproduced from ISO 9712:2005

7.4 Industrial experience

7.4.1 Industrial experience may be acquired either prior to or following success in the qualification examination. Documentary evidence of experience shall be confirmed by the employer and submitted to the certification body or authorized qualifying body. In the event that the experience is sought following successful examination, the results of the examination shall remain valid for up to five years.

7.4.2 The duration of experience for each NDT method is given in Table 2. However, a reduction in the period of experience may be permitted by the certification body, at its own discretion, taking into account the following.

- a) The quality of experience gained can be variable, and skills may be assimilated more quickly in an environment where the experience is concentrated and has a high degree of relevance to the certification sought.
- b) When gaining experience simultaneously in two or more surface NDT methods, i.e., MT, PT and VT, the experience gained in the application of one NDT method may be complimentary to the experience gained in one or more other surface NDT methods.
- c) Experience in one sector of an NDT method for which certification is already held may be complimentary to the experience in a different sector of the same NDT method.
- d) The level and quality of education possessed by the candidate should also be considered. This is particularly the case for the Level 3 candidate but it can also be applicable for other levels. Graduation from technical college or university, or completion of at least two years of engineering or science study at college or university may provide justification for a reduction in experience.

Table 2 — Industrial Experience

| NDT Method | Experience in months (cumulative totals) ^{a b c} | | |
|------------------------|---|--|--|
| | Level 1 ^{d e} | Level 2 ^{d e f} (inclusive of Level 1) | Level 3 ^g (inclusive of Level 2) |
| AT, ET, IT, LT, RT, UT | 3 | 12 | 30 |
| MT, PT, ST, VT | 1 | 4 | 16 |

a Industrial experience in months is based on a nominal 40 hours/week or the legal week of work. When an individual is working in excess of 40 hours per week, he may be credited with experience based on the total hours, but he shall be required to produce evidence of this experience.

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

- two testing methods - reduction of total required time by 25%;?
- three testing methods - reduction of total required time by 33%;
- four or more testing methods - reduction of total time by 50%.

In all cases the candidate shall be required to show that, for each of the testing methods for which he seeks certification, he has at least half of the time required in Table 2.

c In all cases the candidate shall be required to show that, for each of the NDT method/sector combinations for which he seeks certification, he has at least half of the experience required in Table 2, and this shall never be less than one month in duration.

d Experience duration may be reduced by up to 50% (but shall not be less than one month) when the certification sought is limited in application e.g. UT thickness measurement.

e Up to 50% of the practical experience time may be achieved by an appropriate practical course, the duration of which may be weighted by a maximum factor of seven (7). The course shall be concentrated on practical solutions of frequently occurring testing problems, will involve a significant element of testing known defective specimens, and the course *shall be approved by the certification body*.

f For Level 2 certification, the intent of this International Standard is that industrial experience is work performed as a Level 1.

g For Level 3 certification, the intent of this International Standard is that industrial experience is work performed as a Level 2. If the individual is being qualified directly to Level 3, with no time at Level 2, no reduction in the period of experience specified above shall be allowed.

EXPERIENCE - RULES OF IMPLEMENTATION – NDT Advisory Committee

7. Detailed Assessment of Levels of Industrial Experience

To achieve a more comprehensive assessment of experience, candidates will report experience using a new multi-page NRCan experience form that demands more information for each higher level of certification.

- **Trainee Experience:** A check-sheet listing basic equipment used and types of inspections performed. All NDT method experience prior to certification as a Level 1 or equivalent if the candidate is applying direct for Level 2 or Level 3. Experience must meet minimums for Level 1.
- **Level 1 Experience:** A detailed listing of equipment used, reporting of experience by dated inspections performed. All NDT method experience as a certified Level 1 or equivalent if candidate is applying direct to Level 3. Experience must meet minimums for Level 2, Table 2 note f (work as Level 1). A candidate for Level 2 certification must report his experience time both as a trainee and as a Level 1.

- **Level 2 Experience:** A comprehensive listing of equipment used, detailed reporting of experience by dated inspections performed. All NDT method experience as a certified Level 2 or equivalent if candidate is applying direct for Level 3. Experience must meet minimums for Level 3, Table 2 note g (work as Level 2). A candidate for Level 3 must report his experience time as a trainee, as a Level 1 and as a Level 2.

Rational: The intent of this type of reporting of experience in each category is to level the playing field. Presently, a candidate going direct to Level 2 has distinct time and money advantages over a candidate who proceeds by steps attaining Level 1 followed later by Level 2. This is not what we want to encourage as step-by-step produces a better inspector.

8. Attestations of Experience

a) Supervisor: On the revised application form, each level of reported experience (trainee, Level 1 and Level 2) will be attested to in writing by the employee's Supervisor at the time the candidate gained the claimed experience.

* It was suggested that in dubious situations, NRCAN could require a Supervisor to sign the attestation in the presence of a Notary Public so that the Supervisor is held legally responsible for the attestation. Few supervisors would be willing to falsely testify under such circumstances.

b) Sponsor: To protect the attestation from Supervisors 'who will sign anything', a Sponsor (CGSB certified Level 2 or 3) must co-sign the attestation of the various levels of experience.

Rational: To protect the attestation of experience from unscrupulous Supervisors, a Sponsor(s) (CGSB certified Level 2 or 3) must co-sign the attestation of the various levels of experience.

Should the claimed experience be revealed as false, NRCAN can take punitive action against those certified individuals who falsely attested. E.g. That's why a sponsor is required; NRCAN can't revoke certification from an uncertified supervisor.

c) 25% Verification: As a rule, NRCAN will verify the claimed experience of 25% of applicants.

d) Invigilator comments: Weigh claimed experience against invigilator comments on the practical examination.

e) Questionable experience: If the experience claimed is questionable, verify the experience with the trainer.

9. No Reduction in Experience for 'Quality' of Experience

Reference: 7.4.2 a)

7.4.2 The duration of experience for each NDT method is given in Table 2. However, a reduction in the period of experience may be permitted by the certification body, at its own discretion, taking into account the following.

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

Rational: Quality of experience is relative and difficult to measure. The NDT Advisory Committee felt that it would be difficult to compare widely varying scope of experience among candidates. At the end of any assessment process, the best one could say is that the claimed experience is either acceptable or not acceptable. Thus, the Committee recommended no reductions for 'quality' of experience.

CEDO/QO Experience

This was considered a 'quality' issue. Most felt that CEDO's were more rounded in experience than just being 'shooters'. The NDT Advisory Committee felt that 'all' experience, including all time as a CEDO or QO, should be counted toward certification in industrial radiography. If the fellow who only reads film for months on end is acceptable, then the fellow who only 'shoots film' for months should also be acceptable. More details on experience are to be provided by the candidate in the expanded description required under item 7. If the certifying body still has doubts, then query the supervisor, the sponsor and the trainer as under item 8.

10. Limits on the 'Experience' from Practical Workshops

Reference: Table 2 – Industrial Experience Note e).

e Up to 50% of the practical experience time may be achieved by an appropriate practical course, the duration of which may be weighted by a maximum factor of seven (7). The course shall be concentrated on practical solutions of frequently occurring testing problems, will involve a significant element of testing known defective specimens, and the course shall be approved by the certification body.

The NDT Advisory Committee saw the value of practical workshops as valid industrial experience. However, the Committee set limits on the maximum experience time that would be acceptable from practical workshops:

- 2 days maximum for the surface methods (MT, PT, ST, VT), equivalent to ~3 weeks experience.
- 5 days maximum for the volumetric methods (AT, ET, IT, LT, RT, UT), equivalent to ~7 weeks experience.

11. No Reduction in Experience for 'Quality' of Education

Reference: 7.4.2 d)

7.4.2 The duration of experience for each NDT method is given in Table 2. However, a reduction in the period of experience may be permitted by the certification body, at its own discretion, taking into account the following.

d) The level and quality of education possessed by the candidate should also be considered. This is particularly the case for the Level 3 candidate but it can also be applicable for other levels. Graduation from technical college or university, or completion of at least two years of engineering or science study at college or university may provide justification for a reduction in experience.

Rational:

The NDT Advisory Committee expressed the following thoughts in respect to education level and experience.

- Level 1: Education level would have little effect on the experience needed to become a Level 1; one month for surface methods and three months for volumetric methods were considered the minimums necessary – no matter what the education of the candidate.
- Level 2: Education level would have little effect on the experience needed to become a Level 2; after Level 1 an additional three months for surface methods and an additional nine months for volumetric methods were considered the minimums necessary – no matter what the education of the candidate.
- Level 3: ISO 9712:2005 removed all reduction-of-experience for higher level of education that was previously accorded to Level 3s in ISO 9712:1999. Education no longer plays a part in experience.

Thus, the NDT Advisory Committee felt that the level and quality of education possessed by the candidate had no value in respect of reductions in industrial experience required for the various the NDT methods.

12. No Reduction/Increase for Experience in another Sector of the Same Method

Reference: 7.4.2 c)

7.4.2 The duration of experience for each NDT method is given in Table 2. However, a reduction in the period of experience may be permitted by the certification body, at its own discretion, taking into account the following.

c) Experience in one sector of an NDT method for which certification is already held may be complimentary to the experience in a different sector of the same NDT method.

Rational:

The NDT Advisory Committee expressed the following thoughts in respect to experience in another sector of the same method.

By definition in ISO 9712, the Level 1 and 2 General examinations are 'general' to the method while the Specific examinations and the practical examinations are 'specific' to the sector. Thus a candidate for RT-2 in any sector completes the General RT-2 exam.

For certification in RT-2 aerospace structures, the candidate must complete:

- the RT-2 aerospace-structures Specific examination, and
- the RT-2 aerospace structures Practical examination.

Should that candidate later want RT-2 EMC sector certification, he would need to pass:

- the RT-2 EMC Specific examination, and
- the RT-2 EMC Practical examination.

The CGSB and ISO standards associate training (Table 1) and experience (Table 2) with the NDT method, not with the sector. Further, the referenced training curricula deal with hours of training in the various NDT methods; there is no breakdown of training by sectors. The NDT Advisory Committee suggests that for now no additional experience be required for additional sectors within the same method. However, the Committee indicated that future decisions on new sectors would need to be made on a case-by-case basis.

In the case of endorsements to existing-method certifications, additional training and experience requirements would need to be established by the certification body.

e.g. Certification in ultrasonic phased array (automatic ultrasonic – AUT) would require:

- Ultrasonic Level 2 certification (EMC sector), plus
- Additional AUT training, and
- Additional AUT experience.

13. No Reduction for Simultaneous Experience in Different Methods

Reference 1: Table 2 – Industrial Experience, Note b

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

- two testing methods - reduction of total required time by 25%;?
- three testing methods - reduction of total required time by 33%;
- four or more testing methods - reduction of total time by 50%.

In all cases the candidate shall be required to show that, for each of the testing methods for which he seeks certification, he has at least half of the time required in Table 2.

Rational:

Note b is difficult to interpret. A strict interpretation means that the reductions only apply “for each of the testing methods for which he seeks certification”. This creates unfair situations:

- A candidate, with no prior certifications in any method, applies for certification in four methods. Seeking certification in four methods, he receives a 50% reduction in total experience time.
- A candidate, with prior certifications in three methods, applies for certification in a fourth method. Seeking certification in only one method, he receives no reduction in total experience time.

Rather than encouraging candidates to learn in the most effective manner - by mastering one method at a time, the standard encourages candidates to try to master all methods simultaneously – the quickest way to confusion and the poorest way to learn.

Australia and Brazil avoided this problem by noting the “may be” words in the phrase, “Credit for work experience may be gained simultaneously”. Australia and Brazil refused all reductions for simultaneous experience.

ISO 9712:2005 has expanded to ten methods from the 5 methods in ISO 9712:1999. Many of the new methods have little relation to the original five methods. It is more difficult than ever to see how experience in some methods could result in learning that applies to another method.

Reference 2: 7.4.2 b)

7.4.2 The duration of experience for each NDT method is given in Table 2. However, a reduction in the period of experience may be permitted by the certification body, at its own discretion, taking into account the following.

b) When gaining experience simultaneously in two or more surface NDT methods, i.e., MT, PT and VT, the experience gained in the application of one NDT method may be complimentary to the experience gained in one or more other surface NDT methods.

Rational:

Clause 7.4.2 b) logically states that for a reduction of experience time, there must be:

1. Common features between the methods, and
2. Any reduction in experience must retain sufficient experience time in the method to be credible.

Level 1: The experience times in Table 1 are considered bare minimums – 1 month for surface methods and 3 months for volumetric methods. Any further reduction would not retain sufficient experience time in the method to be credible.

Level 2: In the surface methods such as PT, MT and VT, there are common features. This could permit a reduction in experience at Level 2 for the surface methods – to a maximum of 25% for 2 methods and 33% for 3 methods. This would apply equally to candidates seeking certification in multiple methods or to candidates already certified. Further, the same reduction must be applied to each method (instead of to the total time with a restriction of not dropping below 50% in any of the methods). Note: This does not violate the standard; it just restricts the reduction to fixed rather than sliding values.

E.g.

A candidate, holding no prior certification in surface methods, applies for Level 2 MT and Level 2 PT. From Table 2, the experience requirements are 4 months for MT and 4 months for PT. The candidate receives a reduction of 25% in MT and 25% in PT, so the candidate needs 3 months in MT and 3 months in PT.

In the volumetric methods, there are few common features and experience in say ET does not translate into applicable learning in RT and UT. For this reason, the NDT Advisory Committee suggests that no reductions in experience for simultaneous volumetric methods be given to Level 2s.

Level 3: The Level 3 Basic examination examines candidate's knowledge of four NDT methods. So there is some logic in permitting a reduction in experience for Level 3's. However, the new Table 2 has already significantly reduced (by 58% to 83%) the experience a Level 3 requires for certification:

- From 52 months to 16 months = 69% reduction (surface methods with prior Level 2)
- From 60 months to 25 months = 58% reduction (surface methods direct to Level 3)
- From 72 months to 16 months = 83% reduction (volumetric methods with prior Level 2)
- From 72 months to 30 months = 58% reduction (volumetric methods direct to Level 3)

For this reason, the NDT Advisory Committee suggest that no reductions in experience for simultaneous methods (surface or volumetric) be given to Level 3s.

Summary: Given that no experience reductions for simultaneous experience are recommended for Level 1 or Level 3 and could only be applied to the Level 2 surface methods of PT, MT and VT where their value is ~1 month, the NDT Advisory Committee felt it would be less confusing to everyone to simply disallow any reductions for simultaneous experience. i.e. Follow the lead of Australia and Brazil.