Our Expectations from the future ISO 9712: Responsibilities

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Abstract

The effectiveness of ISO 9712 certification depends mainly on the awareness of candidates, certificate holders and their employers about their responsibilities. A third-party assessment leading to certification according to ISO 9712 confirms that an individual fulfils the qualification requirements for an NDT method in a certain level and sector, but it does not represent an authorization for that individual to perform NDT. It can only be given by the employer based on the scope of the certification after the individual demonstrates the skill to properly perform employer specific NDT tasks. The fourth revision of ISO 9712 provided more information on the employer’s responsibilities, the operating authorization and NDT experience but these topics remain the main issues between certification bodies and employers. Furthermore, the possibility to reduce duration of experience is usually confusing for the candidates as well as their employers. In this paper I address these issues and present our expectations from the new edition of ISO 9712.

Keywords: certification, ISO 9712, NDT experience, operating authorization

1 Introduction

ISO 9712 [1] specifies the procedures for qualification and certification for persons performing non-destructive testing (NDT) and it is used to confirm that the qualification requirements are fulfilled for a method, level and sector leading to the issuing of a certificate. Figure 1 shows the elements of NDT personnel certification and authorization. To be certified, a candidate has to demonstrate certain physical attributes, knowledge, skill, training and experience, which are required to properly perform NDT tasks.

![Figure 1: Elements of personnel certification (adapted from [2], Figure 1).](image)

Usually employer chooses a motivated candidate who has a certain level of education and practice in NDT. Third-party certification provides an attestation of general competence but does not represent
an authorization to operate. The employer has overall responsibility for NDT personnel and hence, all that concerns the authorization. In the next sections I will review the responsibilities of candidates, certificate holders and employers according to ISO 9712 and present our expectations from the next revision.

2 Responsibilities

2.1 Candidate

A candidate is defined in ISO 9712 as an individual who gains experience under the supervision of personnel having a qualification acceptable to the certification body. Responsibilities of a candidate according to ISO 9712 are:

a) to provide documentary evidence of satisfactory completion of a course of training
b) to provide verifiable documentary evidence that the required experience has been gained under qualified supervision
c) to provide documentary evidence of vision satisfying the requirements of the standard
d) to abide by a code of ethics published by the certification body

The employer introduces the candidate to the certification body and usually provides the information from a) to c). Especially, the employer has the responsibility to maintain documentary evidence for the experience under qualified supervision as records and this responsibility makes only sense when a candidate is looking for a new job and wants to bring his existing experience to the new employer. The new employer can recognize it, if he is satisfied with the documents and performance of the candidate. Actually the responsibilities of the candidates are much more extensive than above, and may include different local (national) aspects, when we consider the codes of ethics of different certification bodies worldwide. Two international examples for codes of ethics will be presented in this article.

2.2 Certificate holder

Responsibilities of a certificate holder according to ISO 9712 are:

a) to abide by a code of ethics published by the certification body
b) undergo an annual test of visual acuity in accordance with the standard, and submit the results of tests to the employer
c) notify the certification body and the employer in the event that the conditions for validity of certification are not fulfilled
Similar to the candidates, the responsibilities of the certificate holders increase and may differ from each other because of the differences in the code of ethics of the certification bodies. The conditions in c) can be, e.g., failing during the visual acuity examination or a significant interruption in the certified method and scope, for either a continuous period in excess of one year, or two or more periods for a total time exceeding two years. Also here the employer carries the responsibility together with the certificate holder for b) and c) as we will see in the next section.

2.2 Employer

An employer is defined in ISO 9712 as an organization for which the candidate works on a regular basis. An employer can also be a candidate at the same time. Responsibilities of an employer in respect of candidates and certified personnel and according to ISO 9712 are:

a) introducing the candidate to the certification body and document the validity of the personal information provided, i.e. education, training and experience and visual acuity
b) all that concerns the authorization to operate, i.e. providing job-specific training
c) issuing the written authorization to operate
d) the results of NDT operations
e) ensuring that the annual visual acuity requirements of certified personnel according to the standard are met
f) verifying continuity in the application of the NDT method without significant interruption
g) ensuring that personnel hold valid certification relevant to their tasks within the organization
h) maintaining appropriate records

It is no wonder that ISO 9712 recommends that these responsibilities be described in a documented procedure. I will concentrate on two of the responsibilities above, experience in a) and authorization in c).

3 Industrial NDT experience

Industrial experience is defined in ISO 9712 as the experience gained under qualified supervision in the application of the NDT method in the sector concerned, needed to acquire the skill and knowledge to fulfil the provisions of qualification. This should be emphasized strongly: To perform NDT properly and effectively, candidate needs not just knowledge, but skill. Skill can be obtained only through practice, by gaining more and more experience. One can obtain certain theoretical or practical knowledge of NDT by reading books, listening to lectures, looking over his supervisor’s shoulder during an NDT performance, but skill cannot be obtained this way. A candidate can develop the skill necessary to perform NDT only by practicing, by seeing different cases. Unfortunately, it is usually
the industrial experience required for certification the weakest link in the certification process for the certification body (very difficult to evaluate) and it remains the main issue between the certification body and the employer. ISO 9712 specifies time-based minimums for the experience. A certification body can reduce the experience times taking the following into consideration:

- the quality of experience gained (depends on working environment)
- the experience is gained simultaneously in two or more NDT methods
- the experience is gained with certification held in another sector of an NDT method
- the level and quality of education possessed by the candidate
- the scope of the certification sought, i.e. limited in application or technique

Although it is very important for the duration of acquiring the skill required, the quality of experience cannot be evaluated by the certification body easily, and therefore, it is usually not considered. The candidate successfully passes the qualification examination of the certification body but has to wait until the required experience time is reached.

The experience times are numbers on the application forms for the certification bodies, attested by the employers or the supervisors of each candidate and for each method, to the best of their knowledge. It is not possible for a certification body to review the evidence and evaluate the experience in details, main reasons being the trade secrets, confidential information, data privacy, or company policies, and if all of these were settled issues, the limited personnel resources of the certification body. For example, Ultrasonic Testing (UT) Level 2 certification in a sector of interest requires a candidate to have at least 12 months (~2100 hours) of experience. If already certified in level 1, this reduces to 9 months. In 2016, we certified 187 persons for UT method in level 2 and the total experience time attested by the employers was 6674 months. Things get much more complicated for the employer and the certification body when a candidate gains the experience simultaneously in two or more NDT methods. The standard allows 25 % of reduction of total required experience for 2 testing methods. With four or more testing methods the reduction of total required may be increased to 50 %. In any case, the candidate shall have for each method at least the half of the experience required for that method. However, it is very difficult to document the different NDT activities precisely during a normal working day and maintain records for the application for certification later on.

The verification of the continued experience of a certificate holder is close to impossible for the certification bodies, if not much more difficult than it is for the candidates. Theoretically, for each certificate holder up to 5 years of documentary evidence should be reviewed. Also here, the attestation of the employer for each revalidation period, i.e. renewal and recertification, leads to issue of the certificate, for recertification an examination has to be passed in addition. It is the responsibility of the
employer and it is only for the employer practical to verify the continued experience of the NDT personnel and decide if any actions are required to maintain the authorization.

4 Operating authorization

ISO 9712 defines operating authorization as a written statement issued by the employer, based upon the scope of certification, authorizing the individual to carry out defined tasks. The certificate issued by a certification body does not authorize the certified person to operate. ICNDT Guide to Qualification and Certification of Personnel for NDT [2] clarifies the employer’s responsibilities including the operating authorization, and recommends all employers to implement a quality procedure for NDT that reflects the carried responsibilities for the overall quality of NDT. In the end and independent from the certification system one uses; third-party, in-company or their combination, the employer is responsible from all operations performed by NDT personnel.

The quality procedure for NDT shall cover the correct administration and control of NDT personnel in order to meet the quality requirements of the company, its customers and relevant international and/or national regulations and will include reference to at least [2]:

- Applicable codes and standards
- General responsibilities of Levels 1, 2 and 3 and certification required (method, sector, level)
- Persons designated by the employer to be responsible for issuing the authorization to operate
- Control of in-house training and examination supplementary to that carried out during the ISO 9712 qualification and certification process, e.g. job-specific training for tasks beyond the scope of the individual’s certification and for new equipment or techniques and the continuity of NDT activities of certified personnel
- Responsibility for maintenance of records, i.e. education, training, work experience, vision test results, examination results.

ISO 9712 defines job-specific training as the training provided by the employer (or his agent) to the certificate holder in those aspects of non-destructive testing specific to the employer’s products, NDT equipment, NDT procedures, and applicable codes, standards, specifications and procedures, leading to the award of operating authorizations. Therefore the employer checks if the NDT tasks to be carried out are within the scope of the individual’s certification and, if necessary, organizes additional company job-specific training and makes an assessment. ICNDT Guide [2] recommends employers to make use of a checklist to verify the requirements for the authorization and to record the results. If all of the items in the checklist are acceptable, and the employer is satisfied that the personnel can be authorized to carry out NDT for the company, the authorization to work is signed for the employer by the authorized person, usually the responsible Level 3 [2].
5 Code of ethics

ISO 9712 requires the certification body to develop and publish a code of ethics and require all its candidates and certificate holders to abide by it. In this section, I will present two different codes of ethics, one from ICNDT Guide [2] and another from ISO 18436-1:2012 [3], to give the readers an idea of the additional responsibilities of the candidates and certificate holders and to show an example international standard with a normative annex for the code of ethics.

Example 1: ICNDT recommends certification bodies to consider following points when developing the code of ethics for candidates and certificate holders [2], candidates and certificate holders shall:

1) comply with the code of ethics for the personnel certification body under which they are certified;
2) comply with the relevant provisions of the applicable certification scheme;
3) undertake only those non-destructive testing assignments for which they are competent by virtue of their training, experience, qualification and certification;
4) only sign documents which they have personal professional knowledge and/or direct supervisory control;
5) engage, or advise the engagement of, such specialists as are required to enable testing activities to be properly completed;
6) conduct themselves in a responsible manner and utilize fair and equitable business practices in dealing with colleagues, clients and associates;
7) at all times, be aware of and comply with the provisions/requirements of codes, regulations or standards under which they are working;
8) immediately report to the certifying body any perceived violation(s) of codes, regulations or standards;
9) perform their professional duties with proper regard for the physical environment and the safety, health and wellbeing of the public;
10) protect, to the fullest extent possible consistent with the wellbeing of the public and the provisions of this code of ethics, any information given to them in confidence by an employer, colleague or member of the public;
11) avoid conflicts of interest with the employer or client but, when unavoidable, forthwith disclose the circumstances to the employer or client;
12) maintain their proficiency by updating their technical knowledge as required to properly practice NDT in the certified methods and levels;
13) indicate to the employer or client any adverse consequences which may result from an overruling of their technical judgement by a non-technical authority;
14) not falsify, make claims, nor permit misrepresentation of their own or their associates academic or professional qualifications, training, experience or work responsibilities;

15) refrain from unethical acts which would discredit the certification scheme or bring the certifying body into disrepute, and refrain from making statements that the certifying body could consider misleading or unauthorized;

16) immediately report to the certifying body any perceived violation(s) of this code of ethics;

17) immediately report to the certifying body any attempt to pressure or force an individual certified to violate this code of ethics;

18) inform their employer in the event that their certification is suspended, cancelled or withdrawn.

Example 2: ISO 18436-1 is an international standard which defines the requirements for certification bodies operating assessment systems for persons in the non-intrusive machine condition monitoring and diagnostic technologies. According to this standard certified individuals shall [3]:

1) perform their professional duties with proper regard for the physical environment and the safety, health, and well-being of the public;

2) undertake only those measurements and analysis for which they are competent by virtue of their training and experience and, where warranted, engage or advise the engagement of such specialists as are required to enable them to properly complete assignments;

3) conduct themselves in a responsible manner and utilize fair and equitable business practices in dealing with colleagues, clients and associates;

4) protect to the fullest extent possible, consistent with the well-being of the public, any information given them in confidence by an employer, client, colleague or member of the public;

5) refrain from making unjustified statements or from performing unethical acts which would discredit the certification scheme based on this part of ISO 18436;

6) indicate to the employer or client any adverse consequences which may result from an overruling of their technical judgement by a non-technical authority;

7) avoid conflicts of interest with any employer or client and, if any such conflicts should arise in the performance of work, shall inform the affected persons promptly of the circumstances;

8) strive to maintain their proficiency by updating their technical knowledge as required to properly perform condition monitoring measurement and analysis techniques.”

6 Discussions and Conclusions

ISO 9712 defines certification as the procedure used by the certification body to confirm that the qualification requirements for a method, level and sector have been fulfilled, leading to the issuing of
a certificate. The requirements are training, experience, satisfactory vision test and success in examination. Certification bodies make decisions for granting or maintaining certifications based on the information they gather during the certification process. For all the requirements except the experience time, certification bodies receive documentary evidence from the applicant, e.g. training and examination records, and can evaluate these during the certification process. Confirmation of the experience time gained by the candidate, or continued activity in the application of the NDT method for the certificate holder is made by the employer, and remains as numbers or checkboxes on the application forms, since the records of the NDT activities are usually not reviewed or evaluated. On the other hand, conducting qualification examinations is one of the characteristic functions of the certification bodies for persons, with the purpose of using objective criteria to measure competence of a candidate. By passing an examination of the certification body, provided that it is well planned and structured and fulfills the requirements of ISO 9712, a candidate proves his ability to apply (general) knowledge and skills to achieve intended results for NDT. Therefore during the revision of ISO 9712, the paragraph for the industrial experience should be defined as a requirement for employer’s authorization and the certification bodies should be able to issue the certificates after success in qualification examinations. This will lighten the burden on employers and certification bodies, avoid unnecessary duplicated personnel files (one for the company, another for the certification body) and prevent the opinions or assumptions that the certification bodies carry the responsibilities for NDT operations together with the employers. Accordingly, periodic monitoring, e.g. during the periods of certification, should also be made with examinations (=no renewal). This way, the certification bodies can assess certified person’s performance objectively and ensure continued compliance with their certification scheme.

The responsibilities of the candidates, certificate holders and employers are well beyond that is specified in ISO 9712 because of the requirement of undertaking to abide by a code of ethics. Although there is more or less an international consensus about the content of a code of ethics for NDT personnel, and therefore most of the published codes of ethics by certification bodies are similar, I believe it will increase the awareness of all users of ISO 9712, if a relevant chapter is included in the new revision.

References