IMPROVING CERTIFICATION STANDARD FOR HIGHER AND EQUIVALENT LEVELS OF PERSONNEL COMPETENCES

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Abstract
The central point of this presentation is the reliability and equivalence of the certificates issued for NDT personnel all over the world. Regarding the global demands in this field the author highlights the main "leaks" in the standardization of qualification and certification process and makes proposals to overcome these problems. The negative effects of the short-term market aspects dominating nowadays are also emphasized.

Keywords: Qualification and certification of NDT personnel, insufficient standardization, strict and standardized requirements, international supervising

1. Introduction
The enormous development in electronics during the last decades has brought forth very powerful inspection and measuring techniques, data acquisition and evaluation systems and has thus opened new perspectives for non-destructive testing, too. At the same time it would be clearer and clearer that in spite of the growing technical capabilities the "human factor" determined the success of testing. In other words, the persons are the weakest links in the testing processes. Nowadays more and more experts talk about the importance of the in all respects competent personnel. Many (but not yet many enough) interested parties have realized that reliable inspections require well-trained, experienced and also committed personnel.

Non-destructive inspections carried out either in production lines or during plant maintenances may have serious economical and environmental consequences. Let us think about, for instance, a rail cracking or the splitting of a pressure vessel. Due to the complex world-economical phenomenon named globalisation these consequences can of course spread over borders and continents. The world-trade of various products and services shall therefore be based upon non-destructive testing which is equally reliable
irrespective of the place and country of testing and of the operator himself/herself. This basement gives the chance to achieve product quality and plant safety of the same high level all over the world.

So it is easy to understand that beside standards for numerous testing procedures also the first version of international standard for qualification and certification of NDT personnel has been prepared as early as the eighties [1]. About ten years later the standardization in this field has started in the European Union, too [2]. The standards referred to have continuously been developed and supplemented with informative technical documents [3]-[5], e.g. Despite their similarity the two standards have always contained considerable differences. Therefore a global claim for the harmonization of these certification standards has on the side of industrial parties emerged. The harmonization is now being in progress and its result will probably be issued next year. It seems, however, that further steps need to take for the world-wide equivalent competences of personnel.

2 Formal and Essential Regulations

The present days valid standards on qualification and certification of NDT personnel [6], [7] are far from being exact enough to ensure practically the same level of competence of the certified personnel all over the world. These standards provide quite close control only for the certification process itself and contain some formal regulations with respect to training and qualification exams (minimum training hours required, minimum number of multiple choice questions, and so on). Both professional content of training and professional level of exams are, however, not well defined. Unfortunately, these critical comments can be made on the draft of the harmonized standard [8], too.

In order to avoid large fluctuations of personnel competences from country to country, the (minimum) subject-matter of training shall be determined in detail, first of all. The guide [3] referred to already in [6] and [8] offers a good starting point to this activity. But most of the topics given there should be resolved into subtopics. Table 1 illustrates by example the need for this. The partly identical contents of the columns show that the guide don’t distinguish between the various levels in an appropriate manner. The guide [3] shall also be supplemented with a body of engineering knowledge (on fracture mechanics, statistics, corrosion, e.g.) which is supposed as indispensable for level 3 personnel. This should be the training syllabus for preparing candidates for the basic exam part A.
Further on, it is most desirable to make clear the "legal" position of the guide [3]. Namely, it is disputed today whether this guide as being a technical report not a standard may be referred to as a requirement by any standard. The solution of this problem is, in author’s opinion, the standardization of the guide after its syllabuses have improved according to the proposals above.

The professional content of training is crucial from the point of view of the level of exams, too. It is expected that a well-defined syllabus determines the general level of difficulty of the exam questions. The only presumption is that the questions cover the whole syllabus content. So the world-wide equivalent level of the qualification exams can be established by properly prepared and standardized syllabuses. (Note: A syllabus concerns a method, a sector and a qualification level, just as an exam.) The importance of this can really be valued when one can see that exam questions are hard to standardized, if indeed.

Another solution for achieving the equivalency of exams could be an international "question bank". All information technological conditions are ready to set up and use such a data bank. Moreover, all the exams except the practical ones could be carried out on-line. The secrecy of the questions is of prime necessity, of course. This doesn’t seem, however, to be a mission impossible. The huge task is to organize the establishment of the "question bank", so the main question is who or which organization would undertake this work.

3 Market Effects and Training Hours

The reliability and equivalency of certificates issued world-wide for NDT personnel must also be discussed from another important point of view. The problem of possible fluctuations of personnel competences outlined in the previous section will be enlarged by the behaviour of employers and training organizers, who consider – according to author’s experiences – mainly short-term goals such as to spare training costs, on the one side, and to offer the cheapest courses, on the other side. In this way all of them are interested in
training as short as possible. The term “possible” means here the minimum duration approved by the certification body, i.e. the minimum requirement fixed by the certification standard. It should be realized that the standard is the only rule (except the ethical ones) in this case, which can force the parties to follow the right practice. If the standard has deficiencies in determining the requirements, or the requirements are too weak, then short-term market effects will overcome and the reliability of certifications will diminish. This is why it should be thought thoroughly over the minimum training hours required by any standard.

In small countries like Hungary there are higher “driving forces” to decrease the professional level, since the courses are relatively expensive – in general – due to the little number of candidates. (The number of individuals in Hungary, who possess valid NDT certificate/s/ is less than one thousand.) Collaboration of the NDT communities of these countries could perhaps help to solve this problem. Regional training centres should be established, for instance, exploiting the advantages of concentrated resources and groups of great number. Fortunately, there are regions in the world (Central and South America, e.g.) where not even difficulties of language exist. By all means the differences of languages of neighbouring countries must not impede such a collaboration. On the contrary, just the small countries have to pay attention to the education of workman who can read and speak English at a basic level, at least. This is a must also for understanding and interpreting the international standards the translation of which may be a financial problem (as it is in Hungary).

4 International Control

It is hopeful that large fluctuations with respect to the reliability and equivalency of certificates issued in various countries can significantly be decreased by proper standardization of training requirements as highlighted previously. But efforts should be made to decrease this fluctuations further on, to reach as little as possible differences of the personnel competences and to hold the professional level of qualification and certification against the detrimental market effects.

One can say that the certification bodies all accredited uniformly according [9] will ensure an equivalent level of competence for personnel certified anywhere in the world. Experiences indicate however that accreditations (and subsequent audits) cover mainly the documentations and formal requirements. The professional level of activity of the organizations will be pushed into the background during accreditations and audits in many cases. So a world-wide international control of the qualification exams and certification processes would be most desirable. It is clear that this control
could only be of spot-check type, but its returns are expected anyway. The returns mean more than growing professional level, they mean also real profit gained by industrial parties.

It is quite obvious that ICNDT is the organization most suitable to govern this control. ICNDT could – via its member organizations – ensure experts and other necessary resources and it could take care of impartiality of audits.

5 Summary
There is little doubt nowadays about the importance of personnel competences regarding the effectiveness of non-destructive testing. Many experts and industrial parties have realized this and claimed a unique international standard for personnel qualification and certification at the same time. This presentation has intended to draw attention to deficiencies in standardization and the negative market effects. The author has also suggested how to solve these problems and to reach thus a world-wide equivalent and higher level of personnel competences.

The basic proposals are what follows:
- The (minimum) professional requirements of the training should be determined by more detailed syllabuses.
- These requirements should be standardized.
- The qualification exams and certifications carried out in various countries of the world should be by ICNDT governed spot-checks supervised.

Acknowledgements
The author acknowledges gratefully MAROVISZ President Prof. Péter Trampus the helpful discussions on preparing this manuscript.

References


[9] EN ISO/IEC 17024; Conformity assessment – General requirements for bodies operating certification of persons