

Comments Toward the Harmonization of Qualification and Certification of Non-Destructive Testing Personnel in Arab Countries

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Abstract

In most Arab countries, qualification and certification of Non-destructive testing (NDT) personnel, for performing pre-service and in-service inspection of components and structures, are conducted under the requirements of the international standard ISO 9712 or others equivalent standards. Despite that, there is a large difference in knowledge and skill between the NDT personnel of these countries at every level of competence. Additional requirements have to be added to the applied standards to harmonize the qualification and certification of NDT personnel. Harmonization is essential for reaching any mutual recognition agreement of the NDT certificates issued by their certifying bodies. The mutual recognition of NDT certificates will help increasing the industrial co-operation and to freedom the movement of goods and services between the Arab countries.

This paper defines the mains work to be done by the Arab countries at national level and at regional level for mutual recognition agreements of issued NDT certificates between them.

Keywords: Harmonization, Mutual recognition, Qualification, NDT personnel

1. Introduction

There are two general methods for qualifying of NDT personnel, these methods are: In-companies or second party authorization of personnel, for example authorization in accordance with ISO 10256 or EN 4179 standards. In this method the scheme for qualification and assessment of the competence of NDT personnel is controlled by a company procedure. This procedure is ideally drafted and implemented by an independently certified level III person who may either be employed directly by the

company or he is an external consultant. The main advantage of this method is that, the inspector is qualified only in a specific technique related to the inspection task.

Independent or third party personnel certification, for example certification in accordance with ISO 9712 or EN 473. In this method the inspection personnel are required to pass examinations at an approved test center. The examinations are set by one or two professional examiners licensed by an accredited certifying body which has overall control over the certification scheme. The advantage of this method is that, the awarded certificates have wider recognition and relieve the companies from demonstrating repeatedly their effectiveness through audit by prime contractors.

Qualification: qualification is defined as possession of the necessary training, professional knowledge, skill and experience, as well as visual acuity and color perception, to enable NDT personnel to properly perform NDT tasks. Without exception, all certification schemes, whether second or third party define appropriate periods of time for training and experience prior to qualification examination.

Qualification Examination: Qualification Examination is defined as an exam demonstrates the general, specific and practical knowledge and skill of the candidate. Universally, the Qualification Examination of level I and level II personnel comprises separate written examinations intended to demonstrate general and specific knowledge and a practical test in applying the NDT methods to specific products.

For level III personnel, the highest level, the candidate, in accordance with SNT-TC-1A is not assessed for any practical ability, whereas, level III candidate, in accordance with ISO 9712 and EN 473, who has not previously qualified at level II, is required to successfully complete the practical examination applied in level II.

Certification: certification is defined as a procedure leading to a written testimony of individual's qualification in an NDT method and level. This written testimony is given by independent third party as a certificate ^[1-2].

2. The NDT chain of quality

The application of NDT methods on engineering components and structures are very important to achieve their quality at an acceptable cost. Because the consequences of failure are well known and can be disastrous. The NDT engineers and technician must be able to demonstrate that, they have the required level of knowledge and skills to carry out the work for which they are authorized, that is mainly because:

(1) NDT activities are very operator-dependent so that the authority have to place great reliance on the skill, experience, judgment and integrity of the NDT personnel

(2) NDT provides a cost-effective method of quality control before the product put in service, once the product put in service, NDT is often the only methods of defense against failure.

(3) Life extension of power plant, oil platforms, petrochemical plant and aircraft are dependent on highly reliable execution of NDT.

In fact, the reliable execution of NDT operation demands attention to a series of interlinked aspects extending from the underlying science, research and development, procedures, standards, equipment, personnel training and certification, and more over human reliability. These aspects can be represented as links in a chain. Extra attention to one link in the chain cannot compensate for lack of attention to another just as a strong link in a chain cannot compensate for a weak link. For example, personnel certification as a measure of personnel capability to carry out NDT tests is a vital link in the chain. Standard, procedures, and equipment controls can not achieve quality if the inspector carrying out the NDT is not adequately experienced. The opposite is also true. An NDT skills certificate will not guarantee quality if the inspector is expected to use inadequate equipment, is demotivated or demoralized by being put under pressure of time or by being asked to work in difficult conditions.

National and international standards for quality systems such as ISO 9001 require management to establish quality systems to control all activities which affect quality including NDT. The quality system must address each of the links in the NDT quality chain to ensure that, all links are in place and properly joined. Only by such a quality system, once can guaranty the results of NDT operations of critical components and structures ^[3-4].

3. Harmonization the qualification and certification of NDT personnel

Qualification and certification of NDT personnel are a vital link in the NDT chain of quality. They are a measure of personnel capability to carry out NDT tasks. Most of the Arab countries apply ISO 9712 or equivalent standards, such as ARAB-NDT-CER 002, for qualification and certification of NDT personnel,. However, this does not mean that, an automatic acceptance of certification between these countries can be applied. That is due to the fact that, these standards represent the lowest common level of acceptability. Therefore,

every country is free to choose their own level of acceptability with accordance to its certification program and industry needs.

Harmonization of the qualification and certification of NDT personnel in Arab countries can be implemented by achieving the following work at regional level and at national level ^[5-7].

3.1 The requested work needed at regional level

Each one of the Arabs' NDT national certifying bodies (NDT society if existed) has to work with the others to carry out the followings:

(1) Defining the text books or the syllabi for conducting the training courses for each level of certification in the five NDT methods which are RT, UT, ET, MT, and PT. The text books have to be chosen from the available NDT training course series which coincide with ISO 9712. The training courses can also be conducted according to the NDT training guide issued by the International Atomic Energy Commission, IAEA-TECDOC 628. All training material have to be translated into Arabic language.

(2) Designing and preparing many sets of identical flawed specimen for every NDT test method and level. This specimen must be confidential for practical examination only.

(3) Forming the NDT question bank in Arabic language for general, specific and practical examinations for each level of the five NDT methods. The questions could be confidential or non-confidential. In fact the emphasis should be on increasing the number of question, in order to insure that, all the aspects of the subject have been covered.

(4) Communicate with others national certifying bodies the recent information concerning the NDT technology.

3.2 The requested work needed at national level

Each national certifying body for NDT has to carry out the followings:

(1) Forming technical committee for NDT, core group, from NDT level III personnel and charge them to conduct the NDT training courses and the qualification examination for certification.

- (2) Controlling and administrating the question bank, the sets of flawed specimen, the training syllabi and books for every NDT method and level.
- (3) Selecting the national training centers and the national certifying center for the NDT activities.
- (4) Organizing national training courses for every one of the five NDT methods and levels.
- (5) Harmonizing the procedure of certification of NDT personnel with other Arab countries by using the same question bank and the identical sets of the flawed specimen.
- (6) Organizing the qualification examination for certification in the five NDT methods and levels. For this kind of examination, It is essential to invite, at least, one foreign examiner from others national certifying bodies..
- (7) Controlling the correct implements of the applicable standard.
- (8) Providing help in training and certification in all NDT methods to industries upon request.
- (9) Any national certifying body can ask assistance and help from the others certifying bodies for conducting national training courses or national qualification examination for certification.
- (10) Supporting the private NDT training and services companies.
- (11) Creation national NDT society to administer and promote the NDT activity in the country. The existence of the society facilitate reaching any bilateral or multilateral agreement for mutual recognition of NDT certificates between the countries.

4. Conclusion

In fact, there is a real need to a completely harmonize the qualification and certification of NDT personnel in Arab countries. The harmonization of qualification and certification of NDT personnel will lead to a mutual recognition of the NDT certificate issued by their national certifying bodies. This mutual recognition will help to freedom the movement of

goods and services between the Arab countries and will constitute an effective means of industrial cooperation between them.

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