NEW POSSIBILITIES on TRAINING of NDT PERSONNEL

H. İlker YELBAY¹, C. Hakan GÜR¹,² and Ertuğrul YILMAZ³

¹ Middle East Technical University, Welding Technology and NDT Research/Application Center
  06800 Ankara TURKEY, yelbay@metu.edu.tr

² Middle East Technical University, Dept. of Metallurgical & Materials Eng.,
  06800 Ankara TURKEY, chgur@metu.edu.tr

³ Ankalite Quality Control Inc.
  Fatih Sultan Mah. 2366. Str. No:25 Ankara TURKEY, ertugrul@ankalite.com

ABSTRACT

Training is the most important step for qualification of certifying NDT personnel. In order to certify a person for any NDT method satisfactory training is a must in all standards. Due to increased utilization of computer and internet, educational principles have being started to change in the way of online-learning. It is an inevitable fact that NDT societies should adopt themselves in the progress of educational concepts. Since NDT training includes both theoretical and practical parts, a blended learning concept will be the solution for NDT training.

Key words: Online training, blended learning

1. Introduction

High quality products require strictly controlled production steps and high quality materials. In order to ensure about the quality of the product various test methods must be applied. Inspection may be relatively simple by visual inspection or may be complex by using advanced equipment such as x-ray tomography.

Humanity has always requested to test the products since ancient times. It is sometimes a clay barrel for wine or olive oil carriage, a wooden arrow for a weapon, a rail for the railway, a composite panel for aircraft or even a part of the space station. The most basic method for testing a product is visual testing, someone can easily recognize big discontinuities by just looking the surface of the product. But in order to see whether are there any defect in a casting we require developed techniques and devices like we use in radiographic or ultrasonic testing.

Today there are different techniques that used for testing products without destructing them, i.e., non-destructive testing (NDT) methods. In order to get satisfactory results from these techniques, well-trained and qualified persons are needed in addition to the equipment. Training is the vital part of NDT since no one can sure about the correctness of the tests and results without required skills and knowledge. There are several international standards related to the certification of the NDT personnel in which training is mandatory for certification.
Online training has been gained importance in education. Most of the well-known universities have online lectures that you can participate and get university degree. It is an inevitable fact that online training will be the future of education that should also considered by the NDT community.

2. Current Situation – Applicable Standards

Certification of NDT personnel is mandatory for most of the sectors. There are several standards that can be used for certification of NDT personnel. ISO 9712 standard generally accepted by most of the countries but there is also another well-known guidelines for certification like SNT-TC-1A. All standards require training and examination to certify the personnel in different NDT levels.

EN ISO 9712:2012 is internationally accepted standard for certification of NDT personnel and used by most of the countries all around the world.

EN 4179 and NAS 410 are used for aerospace industry. There is an obvious global requirement that the qualification and certification of personnel for NDT inspections shall be carried out in compliance with specific approved rules in aerospace industry. In order to cover these rules aerospace industry use employer or company based standards.

SNT TC 1A is an employer based certification system. It is not a standard but a recommendation or guideline for companies that willing to certify their NDT personnel by generating their own written practices. It is first published on 1966. The 2016 version is now available. Computer or web based training options are included to this guideline on 2011.

ANSI/ASNT CP 189 is a national standard of US for certification of NDT personnel which published in 2006. CP-189 and the SNT-TC-1A are similar in that both use training, experience and examination as the basis for certification but CP 189 has strict rules that the employer cannot change by company’s needs. The 2016 version is now available.

The ANSI/ASNT CP-106 document is a modified adoption of ISO 9712. It was adopted by ASNT to comply the requirements of ISO 9712 for harmonization of the standards.

3. New Possibilities

Continual improvement of technology brings new possibilities for education. There is an increasing trend for online or computer based learning. People can reach information in seconds by using their phones or tablets. There are millions of videos already uploaded in internet for instant learning. So if someone wants to learn a specific topic he or she can easily learn by just watching the videos and reading supplied information. This also brings us new opportunities to teach non-destructive testing methods.

There is a possibility to train the operators by online training. In SNT TC 1A:2011 version, it is stated that a training can be done by instructor-led, personalized instruction, virtual instructor, computer based or web based training. So online training is already accepted by a guideline that used internationally. It is obvious that ISO standards will include online training option soon.

There are several advantages of online learning over traditional learning. However, due to the practical application issues of NDT methods only online training is not enough for a person to fully understand the technique and method-specific instruments. In order to cover practical training the participant should visit the training academy or receive on-site training after completing theoretical lectures by online training.

Combination of online training and practical training, i.e., “blended learning” is necessary for NDT. In blended learning, after completing online theoretical lectures participant learn how to use method specific instruments by practical lectures. The main advantage of blended learning for NDT certification is the training time. Most of the technicians already working do not have
time for training. Also employers do not want to send their employees for long duration courses like ultrasonic and radiography. So, training hours can be reduced by blended learning. Another advantage is to learn anywhere and anytime by using smart phones for mailing, talking, surfing in the internet etc. The possible disadvantages of online learning such as the lack of communication among participants and sector-specific difficulties in practical issues can be overcome by the blended learning.

Although there is no international standard that explicitly accepts online learning, there is an increasing amount of interest in online learning option in NDT community. There are several commercial companies that have already developed online training systems. There are two different approaches for online learning systems. First one is the web based system that include a software including information and animations to introduce the concepts. The second approach is based on video-based learning in which lecturers give the lectures like in classroom environment. Both systems have their own advantages and disadvantages. In order to satisfactorily apply online learning in non-destructive testing both systems should be discussed in detail.

4. Conclusions

The world has been changing in a very fast manner by the usage of computers and internet. People can obtain any information by using mobile phones instantly. It is a very important advantage to use this technology for education. There are several universities that have already started online learning. NDT societies need to benefit from the advantages of internet also by implementing online training options to the existing NDT certification standards.

5. References

[1] ISO 9712 (2012), Non-destructive testing – Qualification and certification of NDT personnel
[3] SNT-TC-1A (2011), ASNT Recommended practice for personnel qualification and certification in non-destructive testing
[4] EN 4179 (2009), Aerospace series - Qualification and approval of personnel for non-destructive testing