Training and Certification Programmes for Advanced NDT Methods

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Introduction

This paper explains the background to the development and establishment of the British Institute of NDT's programmes for Training and Examination in Advanced Ultrasonics. The Author describes the process of how a programme evolves from initial enquiry through to the delivery of the examinations. Finally the Author considers how Central Certification and Employer based certification might be the answer to the challenges of highly advanced and very specialised testing techniques and equipment.

Enquiry

Ultrasonic testing using the Time of Flight Diffraction principles has been around for over 30 years. Development in equipment and probe design and advances in the computing power of the system have lead to an upsurge in its use in the past 10 years.

As Ultrasonic Inspection using TOFD increased so there was an enquiry as to whether there was a validated programme through which NDT Technicians could be trained and examined.

Working Group

Within the British Institute of NDT, the PCN Scheme[1] has been established since the early 1980s and has, through its Councils, Boards, Committees and Working Groups, established an internationally recognised Examination Programme backed up by a Training Accreditation Scheme also run by the British Institute.

Following the initial enquiry for a new work item – in this example UT Time of Flight Diffraction – so the Certification Services Department puts out a call for interested parties to form a Working Group. If it can be established that a Working Group can be created with suitable representatives of Industry, End Users, Manufacturers, Trainers and Examiners, then the Working Group is formed with a remit to develop three documents:

a. Requirements Document
b. Syllabus
c. Typical Questions/Answers

plus a further document which would be a minimum requirement document for Trainers/Examiners to comply with in terms of equipment and samples.

The Working Group meets as a group of experts and develops the previously mentioned documents.

With the Time of Flight Diffraction programme we had a good start as there was already in existence a British Standard (BS7706)[2] which included a framework for the establishment of a training and qualification programme. For the Phased Array Working

Group there was a much greater challenge as there was no such document.

A further early problem was that of the inspection seeming to be equipment specific and it is not appropriate for a central certification programme to be specific to a particular piece of equipment.

After considerable debate it was decided that we could progress by defining a number of specific competences we expected the candidates would be able to demonstrate at a particular level.

The Working Group proposed that a TOFD Level 2 technician should first be a qualified UT Level 2 Welds operator (to a BINDT recognised scheme) and that the following competences should be demonstrated:

a. Understanding of the principles of TOFD
b. Set up and calibrate the TOFD equipment
c. Collect valid data using the system
d. Examine and evaluate the data and determine its suitability for interpretation
e. Interpret and report on a selection of data files
f. Prepare a detailed Written Instruction

Whilst the TOFD programme[3] was seen as a natural extension to the UT Weld Technician this was not the case with the Phased Array programme[4] as Phased Array can be potentially used with a wide range of products. In this programme a statement was included in the 'Scope' that the employer must satisfy themselves that the individual is sufficiently competent at using specific equipment and software appropriate to the product under test. This would normally be managed within the Company Quality System.

Once this was agreed we moved on to the eligibility requirements, the training programme and syllabus and the structure of the examination. Each of these items will be discussed in the lecture.

Once this work was completed, a Draft Scheme document was created and submitted to the General Technical Committee for comment.

Further Committees

Once there is approval at Working Group stage the document then goes to the General Technical Committee and then to the Certification Management Committee and finally receives Institute approval. The TOFD document was first issued in January 2004.

Once the document is issued then it is up to the Trainers and Examiners to take it on and meet the equipment and sample requirements. Again this can be particularly difficult and expensive for the Trainer and/or Examiners due to the highly technical nature of the equipment.

We are currently also working on a programme for the Ultrasonic Testing of Austenitic Welds and a further Working Group for Digital Radiography is in its final stages of development.

Summary

a. For a new programme to evolve within the BINDT/PCN programme a Working Group needs to be established representing all aspects of the industry involved with the new programme.

b. Agreement must be reached on the document requirements in order to create a meaningful demonstration of competence in that method/technique.

c. Training, work experience and examinations need to be carefully considered within each programme.

d. The process must be overseen by a variety of committees operating at different levels and the whole process can easily take 18 months from first meeting to delivery of the documents.

e. Once in place a monitoring exercise is required to ensure that the programme does indeed meet the needs of industry.

f. Finally, it is proposed that due to the very specific nature of some aspects of advanced NDT that the training, examination and qualification of NDT personnel is managed within a Company Written Practice based on SNT-TC-1A[5] which would incorporate the generic competences provided by central certification with an employer specific test on the actual products. This will be covered in more detail by the Author in the lecture.

References

[1] PCN/GEN General requirements for qualification on PCN certification of NDT personnel. BINDT 1.4.06
[2] BS7706 Calibration and setting up of the UT TOFD techniques for defect detection, location and sizing of flaws. BSI 1993
[3] Specific requirements for the certification of personnel engaged in UT of TOFD testing of linear butt welds in ferritic steel. BINDT 1.1.06
[4] Generic requirements for the certification of personnel engaged in UT using Phased Array transducers. BINDT 1.1.06
[5] SNT-TC-1A Recommended Practice – Personnel Qualification and Certification in NDT. Various editions 1996, 1998, 2001