



Introduction

Meetings were held at the European Conference in NDT in Barcelona to discuss various aspects of Certification and the next Edition of ISO 9712² might be available this year. I wish to add a note of caution concerning a document produced by the ICNDT in draft form which was issued on the floor of the NDT Exhibition in Barcelona. The document, in a pale blue cover with red writing, is entitled ICNDT Recommended Guidelines for Qualification and Certification of NDT Personnel According to ISO 9712 – Draft 2002. Within its pages is a document entitled ISO 9712 Standard Ed. 2000. Please be aware that this is not an official ISO document and has been issued to the general NDT world when it shouldn't have been. If you receive a copy please send it back to the Institute.

I have also discussed the possibility of incorporating a statement at the front of ISO 9712 confirming the responsibility of the employer for applying the authority to work and suggesting that this authority should be clarified through the employer having a Written Practice.

This month's Article begins a double bill on the Examinations – this month, Level 1 and Level 2 and next month, the more complex issue of the Level 3. A previous article (July 02) dealt with the Vision Exam.

Structure of the Exams

Right from the beginning the Level 1 and Level 2 exams have been structured around the following principles:

- a. *General Theory* – covering the fundamental physical principles relating to the Method.
- b. *Specific Theory* – covering the equipment, operating procedures and test techniques applicable to the Method.
- c. *Practical Test* – a selection of practical tests to demonstrate familiarity with the test equipment and the ability to detect defects associated with the item under test.

Preparation of Exams

It is normal practice in all systems that the Level 3 is approved by the Employer to create, review, approve and mark exams.

It is also usual in the Central Certification Programme that the Trainer and Examiner are not to be the same person, and that the Examiner will have no interest in the candidates – this is quite different from the Employer based scheme where the Level 3 is likely to be closely linked to the Employer and therefore the candidates.

For specific exams, one of the advantages of the Employer based programmes is that the Level 3 can work closely with the Employer in creating the exact examination required to assure the Employer that the NDT technicians have demonstrated their ability to understand the Employer's requirements. This, by its very nature, cannot be the situation with the Central Certification Programmes.

Style

In all cases, Level 1 and 2 exams are multiple choice. There are papers written on how to create a multiple choice question but much of it is common sense.

It is now accepted practice that the questions in the ASNT Question and Answer books should not be used as published to create exam papers but for the purposes of training and to establish a common level between examiners and examinations.

Open or Closed Book

There has been long debate and discussion on this subject. First of all the definition of closed book isn't particularly helpful (SNT)³ – 'an examination administered without access to reference material except for materials supplied with or in the exam'. I say this is confusing because a PCN⁴ examination for a specific paper does not allow access to specifications being questioned upon (closed book).

So what then is open book defined as? This appears to mean that the candidate has free rein as to which resource material he may select to assist him with answers to the questions - a situation unacceptable to most schemes.

So let's look at the closed book problem – my experience is that all general theory papers are closed with usually only formulae provided within the exam. So it is the Specific exam which is the problem. What, then, is the purpose of the Specific exam – is it to test whether the candidate can learn a standard like a parrot, or is it to check whether he can find and interpret information from within a specification which is provided? I think the latter. I am also concerned that some Employers want half a dozen specifications within a Method tested – I am of the opinion that if a candidate can demonstrate competence to extract material from one document related to a Method, then he can probably do it for any document pertaining to that Method. But it is the Employer's decision, and this should be clearly stated in the Written Practice.

The Practical Test

All systems of certification agree on one aspect of this exam and that is that all defects within a part under examination must be located and sized within prescribed parameters.

Other aspects, however, are not so clearly defined. The Central Certification Programmes require the test of 1, 2 or 3 samples from the Examination Centre's body of approved samples. There is no requirement for the exam samples to meet any employer specific needs – in fact the PCN document states: 'The Employer cannot be directly involved in the qualification examination.' This could be a bit difficult to manage as part of the definition of the Employer is that 'an employer may be a candidate at the same time'!!

A part of the practical Level 2 examination is a demonstration of the ability to prepare a Written Instruction as a Level 1. This is a part of the Central Certification exam but not necessarily required in the Employer based programme unless specifically added to the Written Practice by the Employer.

Once again the role of the Employer in applying the authority work needs to be clearly established in a Written Practice. In this respect, it is clear that the Employer - whichever type of certification programme is followed – should carry out a company specific practical test on his precise requirements before giving the authority to work – after all, it is the Employer's responsibility.

Timing

It is usual to allow around 90 seconds for each Level 1/Level 2 exam multiple choice question, although for Employer based programmes this could be covered in the Written Practice. For Central Certification this means that 30 question papers will be completed inside 45 minutes and 40 question pages within 1 hour. The Practical exam usually allows 1 hour per sample for Surface Methods and longer for Internal Methods. The precise times are covered in the documents or in the Written Practice.

Marking

The marking of the Theory exams is straight forward – 1 mark per question and ultimately generating a percentage mark. The marking of the practical test and the Written Instruction is, however, much more complex. The Employer based programme, as you will expect, is defined by the Written Practice but, in practice, allows the Level 3 examiner a realistic role in using a Check Point System (at least 10 points) and his own expertise to determine whether a sample is passed or failed, taking account of the overbearing requirement that all defects are found, located and sized within specific parameters.

EN 473, however, provides an Informative Appendix for each National Scheme to incorporate into their own system so prescribing exactly where the marks for a particular section of the practical will be allocated.

For example, Level 2 post test procedures – 1 mark; knowledge of the NDT Apparatus – 10 marks.

It is my opinion that to prescribe marking schemes too tightly does not allow the Level 3 examiner the freedom to exercise his skill or expertise in the examination process.

Grading

This has become rather complicated in some areas. For some reason SNT-TC-1A picked up on the idea of 70% for each 'part' and a composite grade of 80%. Further, a number of SNT editions and some Central Certification Programmes allow for a complex arrangement of weighting factors. It is still difficult, however, to explain to a candidate with results of 75% General, 75% Specific, 75% Practical – Composite 75% - that he has failed and must retest a part to achieve the composite grade.

I understand that there is a move in the Central Certification Programmes to remove the Composite Grade so we must watch out for that.

Re-sits

So what happens if the candidate fails an exam? The obvious answer is, as usual, for the Employer to describe such parameters within a Written Practice. In most systems this means that a candidate can retest any part or parts of a failed exam after 30 days or after a period of further training. What is not so clear is what happens if the operator fails the re-sit. In the Central Certification programme the candidate will return to an Initial candidate after just one retest. In the Employer programmes, these points are less clear and should therefore be clarified within the Written Practice.

The Certificate of Examination

One of the most valued, but misunderstood documents in NDT.

It should be clear by now that the Certificate of Examination is only part of the qualification process. However it has become custom and practice that all contractors require to see is the operator's ndt certificate of examination – and this in turn has led to the misunderstanding that this certificate of examination is the authority to work – it is not.

PCN (EN 473) first issue a Results Notice (from the Test Centre) and then follow this up with the Record of PCN Certification. As considered above – this record is not the Employer's Authorisation to Work.

What must happen is that all parts of the certification process are taken into account by the Employer and then the Employer applies the authority to work on the technician.

Conclusions

- 1.0 Examinations provided under a Central Certification programme are predetermined and cannot be amended or changed by the Employer.
- 2.0 Examinations provided under the Employer based schemes are created in a partnership between the Employer and the Level 3 to ensure that the employer's equipment, products and techniques are examined appropriately.
- 3.0 The Certificate of Examination or the Record of Certification is not the authority to work – this can only be generated by the Employer through a Written Practice.
- 4.0 If the Employer utilises a Central Certification programme it is in his interests that he re-examines the technician to his own specific requirements and then provides the authority to work, as the candidate may not have been examined on products or equipment in use by the Employer.

References

- 1.0 *NAS 410* Current Issue May 1996. Publisher Aerospace Industries Association of America. (Note June 2002 now issued)
Official title: National Aerospace Standard Certification and Qualification of Non-Destructive Testing Personnel – NAS 410
- 2.0 *ISO 9712* 1999 (E) published by ISO.
Official title: Non-Destructive Testing – Qualification and Certification of Personnel. Second Edition dated 1999-05-01.
- 3.0 *SNT-TC-1A* Current Issue 2001. Publisher ASNT.
Official title: Recommended Practice No. SNT-TC-1A Personnel Qualification and Certification in Non-Destructive Testing.
- 4.0 *EN 473* (UK National Scheme PCN) Current Issue BSEN 473 2000: Publisher BSI
Official title: Non-Destructive Testing – Qualification and Certification of NDT Personnel – General Principles