



QUALIFICATION AND CERTIFICATION OF
NONDESTRUCTIVE TESTING PERSONNEL

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ABSTRACT

Nondestructive testing and inspection are important functions in achieving the goals of quality and efficiency at an acceptable cost. All quality assurance systems necessitate that engineers, technicians and craftsmen are able to demonstrate that they have the required level of knowledge and skill.

This applies particularly to Nondestructive Testing (NDT) and inspection for two reasons. First, NDT and inspection activities are very operator-dependent and those in authority have to place great reliance on the skill, experience and judgement of the people who perform them. Secondly, in fabrication companies, inspection provides the last line of defence before the product goes into service. During service NDT and inspection provide the only line of defence.

Once the inspection programs have been developed a qualification and certification system is required for the personnel responsible for performing inspections, in order to ensure that these are carried out to the required level of quality.

All national and international standards and guidelines require that all personnel performing activities affecting quality, specifically NDT personnel, shall be qualified on the basis of general education, experience and proficiency required for performing the specific assigned tasks (1). The presented paper shall highlight the most important national and international standards and guidelines addressing training, qualification and certification of NDT personnel.

1.0. CATEGORIZATION OF INSPECTION AND TEST PERSONNEL

Inspection consists of quality control (QC) actions which by means of examination, observation or measurement determine the conformance of items and/or activities with predetermined quality requirements. Testing is the verification of the capability of an item to meet specified requirements by subjecting the item to a set of physical, chemical, environmental or operational conditions.

National and international practices and qualification standards distinguish two groups of inspection and test personnel. Firstly, personnel performing NDT (NDT inspectors) and secondly, personnel performing other types of inspection and testing (QC-inspectors). NDT personnel perform inspections using NDT methods as Radiographic Examination (RT), Magnetic Particle Examination (MT), Liquid Penetrant Examination (PT), Ultrasonic Examination (UT), Eddy Current Examination (ET), Leak Testing (LT), and Visual Examination (VT) require specific technical knowledge and respective qualification.

The qualification requirements may be classified into a number of levels according to the capabilities and the nature of the responsibilities of the personnel level (level 1, 2 and 3) (2). An individual certified to NDT level 1 is qualified to carry out NDT operations according to written inspections and under the supervision of level 2 or level 3 personnel. An individual certified to level 2 is qualified to perform and direct NDT according to established or recognized techniques. He shall be competent to develop NDT procedures, to interpret and evaluate results according to applicable codes, standards and specifications.

An individual certified to level 3 shall be competent to carry out all duties for which a level 1 and level 2 individuals are qualified. In addition level 3 is capable for designating the particular test method and establishing acceptance criteria where none are otherwise available. NDT level 3 is also able to qualify level 1, 2 and 3 personnel.

Personnel performing direct inspections and test except NDT may be classified on the basis of the technical disciplines in which they perform their activities. There may be many options for specialization, depending on the type of industry and testing are, Mechanical Equipment Inspections, Electrical Inspections, Civil Construction Inspections, Welding Inspections, and Equipment Performance Tests (2).

2.0. NDT PERSONNEL CERTIFICATION, THE OPTIONS

There are two main international systems for qualification and certification of NDT personnel, namely, in-company certification system and independent certification system.

In-company certification scheme the qualification and certification of NDT personnel is controlled by the company procedure (standard practice). This procedure is produced and operated by the independently qualified person who may be employed by the company's level 3 or be an outside agency. In independent certification system the inspection personnel are required to attend an external, independent test centers to site an examination relevant to their work. Such test centers are licensed by a national certifying body which has the overall control of the certification scheme it operates.

The main advantage of the in-company certification system is that companies with unusual inspection requirements can ensure that their people are qualified in areas specific to the inspection task and not compelled to take examinations that are not relevant to the company's product.

With respect to the independent certification system the main advantage of this approach is that independently verifiable and recognized qualifications relieve the company of having to devise and demonstrate the infallibility of an in-house scheme.

2.1. In-company certification system

This system is applied in the United States of America and other countries.

One of the basic points of the philosophy of the in-company certification system is to place responsibility for certification for the above mentioned three levels on the employer. One of the most widely used documents in this respect is the ASNT (American Society for Nondestructive Testing) Recommended practice "SNT-TC-1A. The latest edition of which dates from December, 1992(3). Placing the full responsibility for certification on the employer has led to certain abuses which in some cases, have bordered on a complete lack of professional ethic.

In order to avoid such abuses and improve the overall characteristics of the qualification and certification system, ASNT has recent published a standard as the "ASNT Standard for qualification and certification of Nondestructive Testing personnel". On Mar.15, 1991, The board of Standards Review (BSR) of the American National Standards Institute (ANSI) approved the ASNT Standard.

The standard, bearing the ANSI prefix. is now designated ANSI/ASNT CP-189-1991, "Qualification and certification of Nondestructive Testing personnel" (4). ANSI/ASNT CP-189 details the minimum training, and experience requirements for NDT personnel and provides criteria for documenting qualification and certification.

These minimum requirements are more stringent than the recommendation of ASNT Recommended practice No. SNT-TC-1A. The standard requires central certification plus employer certification of level 3 personnel. It requires level 3 responsibility for all phases of NDT operations and contains sanctions for improper performance. Requirements for NDT instructors are also included.

2.2. Independent certification system

In this system the certification activity that includes all procedures adapted to demonstrate the qualification of an individual to carry out tasks in specific NDT method

and leads to a written testimony of this competence, shall be administered by a national certifying body, with the assistance, where necessary, of duly authorized qualifying bodies. This philosophy has received the majority acceptance and support from all the European nations within the scope of the committee CEN-138 "Nondestructive Testing".

The objective of this committee, which first met in January 1989, is to standardize NDT and more especially, the qualification and certification of personnel. As a result of these efforts the International Standard ISO 9712 has been issued. This international and European Standard establishes the rules for an independent certification system via the creation of three organizations, namely, an "Independent Certification Body", a series of "Authority Bodies" and the "Examination Centers"(5).

The "Independent Certifying Body" is responsible for administering NDT personnel certification in accordance with the applied standard. The "Authorized Bodies" are employer independent bodies authorized by the "Independent Certifying Body" for the preparation and administration of examinations for level 1,2 and 3. Finally, the "Examination Centers" are recognized either directly by the "Independent Certifying Body" or indirectly via one of the "Authorized Bodies".

These three levels of organizations provide a sufficiently ample and flexible system that may be adapted to the needs of the different European nations, since it is not necessary for all three to coexist in any one country.

This philosophy of independent system for certification of NDT personnel has been implemented in United Kingdom (UK) since 1989 as described by CSWIP "Certification Scheme for Weldment Inspection Personnel" (6). This scheme originally covered ultrasonic and radiography testers and was later extended to include magnetic particle and penetrant testers, welding inspectors and underwater inspectors.

In recent years the national PCN scheme "Personnel Certification in Nondestructive Testing", having broader coverage for NDT applications, has been introduced.

Management of the PCN scheme is by an independently constituted Central Certification Board, CCB, representative of trade associations, associations of insurance bodies, major sectors, Government Departments and other interested parties with fabrication, user, inspection and insurance interests (7).

The PCN scheme is designed to set and maintain standards for the proficiency of NDT Personnel through independent examination and assessment. It is also designed to meet as a minimum the international requirements laid down in ISO-9712.

3.0. QUALITY ENGINEERING PROCEDURES (QEP-001) OF THE EGYPTIAN ATOMIC ENERGY AUTHORITY

The Egyptian Atomic Energy Authority (AEA) has established since 1990, an independent certification scheme for qualification and certification of NDT personnel. The Quality Engineering Procedure (QEP-001) of the AEA establishes the minimum requirements for qualification and certification of NDT Personnel.

These requirements are based on the ISO-9712 Standard, SNTTC-1A Recommended Rules and the International Atomic Energy Agency (IAEA) Technical Document IAEA-TECDOC-407. QEP-001 is considered the first National Scheme for qualification and certification of NDT personnel in Egypt.

The procedure is implemented the by AEA and have been used since 1990 in certification of NDT personnel of some Egyptian Industry and Arab Organization for Industrialization (A.O.I).

5.0 REFERENCES

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