

The UDT-CERT system as a nationally recognized system for the certification of competence of NDT personnel

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Abstract. In the paper includes the UDT-CERT System at UDT – Office of Technical Inspection (National NDT Personnel Certification System UDT-CERT) as a nationally recognized system for the certification of competence of NDT personnel. UDT is a notified body No 1433 and recognized third-party organization for the purposes of the tasks referred to PED, Annex I, sections 3.1.2 and 3.1.3 of the European Directive 97/23/EC (Pressure Equipment Directive – PED). The UDT-CERT System is accredited as meeting the requirements of the European standards EN ISO/IEC 17024. The certification scheme of National NDT Personnel Certification System UDT-CERT has satisfied all of the qualification criteria of the EFNDT Agreement for Recognition of NDT Personnel Certification Schemes, and has been accepted for recognition and registration within the terms of the Multilateral Recognition Agreement (MRA) and was approved by EFNDT as „Registered Body”.

National NDT Personnel Certification System UDT-CERT offers three levels of certification specific to industrial sectors and NDT methods defined as follows: Ultrasonic testing UT, radiography testing RT, magnetic particle testing MT, liquid penetrant testing PT and visual testing VT of industrial sectors: 6 – metal manufacturing (combining: castings (1), forgings (2), welded products (3), tubes and pipes, including flat products for manufacturing of welded pipes (4), wrought products (5) and 7 – pre and in-service testing of equipment, plant and structure (combining: castings (1), forgings (2), welded products (3), tubes and pipes, including flat products for manufacturing of welded pipes (4), wrought products (5). The System offers as well: interpretation of radiographs RTI as a separate one level certificate in industrial sectors 1, 3 or 6 and 7 as defined above, ultrasonic measurement of thickness UTT as a certification in two levels in sectors 6 and 7 and magnetic testing of steel ropes during fabrication and maintenance (MRT), MTR.

1. Introduction

Polish national system of technical inspection has almost hundred years old tradition. It was built up step-by step in response to the growing demand for technical safety. Due to the importance of the matter the system has been regulated by the Act of Parliament.

The enforcement of the regulations is mainly assigned to the Office of Technical Inspection (UDT). Other inspection bodies operating within the national system have their competence in specific areas such as military equipment, railway & road transport means and shipping installations.

Office of Technical Inspection (UDT) realizes the tasks connected with carrying out the technical inspection according Parliament Act about the Technical Inspection.

There are 29 regional offices distributed over the whole territory of Poland and Central Laboratory of Technical Inspection (CLDT).

The UDT activity takes up the three essential areas:

- as an Inspection Body,

- as the Notified Body and the Recognized Third Party Organization,
- as the Certification Body.

1.1 UDT as an Inspection Body

The traditional scope of UDT activities as an inspection body covers the inspection of installations likely to create hazard to human life and health, property and environment through:

- expansion of liquids or gases subject to pressure other than atmospheric (pressure equipment),
- release of potential or kinetic energy during transportation of people and/or loads over limited distances (lifting devices),
- diffusion of dangerous substances of toxic or caustic properties during their storage or transportation (tanks, containers, reservoirs, etc.).

The UDT activity takes up during the manufacture and exploitation phase of the technical devices.

UDT operates in the manufacture phase when the particularly law regulations does not decide otherwise.

Following directives are connected with the UDT activities:

- the new and global approach directives,
- the directives support on the new approach,
- the old approach directives,
- the horizontal law acts for European Union,
- the sector law acts for European Union,
- the industrial safety directives for European Union.

1.2 UDT as the Notified Body and the Recognized Third Party Organization

UDT is the Notified Body for 11 directives to European Union: 97/23/EC¹, 90/396/EEC², 95/16/EC³, 87/404/EEC⁴, 92/42/EWG⁵, 73/23/EEC⁶, 98/37/EC⁷, 94/9/EC⁸, 2000/14/EC⁹, and 1999/36/EC¹⁰, and as the competent body (CB) for 89/336/EEC¹¹. It should be noticed that each listed directive is accustomed with general decision contained in the estimation system law and detailed in proper decree based on the law.

1.3 UDT as the Certification Body

Certification is the most important element to ensure the technical safety. Certification in UDT may be requested or unsolicited. The Certification Body is accredited by the independent, the national Accreditation Body, Polish Center for Accreditation (in Polish – PCA) according to the Polish law. Certification basics are the reference documents as the standards and / or technical specifications.

To realize certification activities within the UDT organization, the UDT-CERT structures were established. The Certification Body UDT-CERT operates in the three accredited areas:

- the quality systems certification in accordance with EN 45012¹²,
- the persons certification (incl. non - destructive testing personnel and welders) in accordance with EN ISO/IEC 17024¹³,

- the products certification in accordance with EN 45011¹⁴.

UDT is widely involved in the international cooperation, in particular through the membership of CEOC - the confederation of our European partners that is also accessible for non-European applicants. Our experts cooperate with CEOC, CEN, European Committee working groups, other Notify Bodies in Europe and ISO.

2. UDT activities as the Certification Body for NDT personnel

2.1 History

The National NDT Personnel Certification System UDT-CERT operates In UDT. The history of this System has ranged from 1970.

In 1970 at Institute of Metallurgy in Gliwice (Poland) the system to verify qualification and competence the NDT personnel was formed. The NDT inspector books (in Polish - „*Książki kontrolerów badań nieniszczących*”) by the Institute were issued. This system called PTBN-CERT existed in 90s as qualification and certification system of NDT personnel and was directed by the Polish Society Non-Destructive Testing (in Polish – PTBN). EN 473:1993¹⁵ was the reference document for PTBN-CERT system. But PTBN-CERT system was not accredited.

In 1987 the national commission was set up in the Polish Society for Mechanical Engineers (in Polish – SIMP) for qualification of the first group of level 3 Polish NDT experts based on „*grand-fathering*” approach. They obtained diplomas corresponding with level 3 certificates.

While preparing Poland and UDT to EU accession, the necessity for establishing improved national certification system of NDT personnel appeared.

UDT was the leading unit in creation process of the National NDT Personnel Certification System UDT-CERT. The aim of Phare’97 project, realized in 2000, was to create National NDT Personnel Certification System and to prepare basics for PED implement in the requests for personnel NDT.

Phare’97 project was realized in cooperation with German Society for Non-Destructive Testing DGZfP experts and Certification Body DZP. The several tens of Polish specialists in the five NDT methods obtained then proper certificates acc. to EN/FDIS 473:2000.

Moreover, some training and examination centers were provided with research and training equipment. Documentation was obtained to prepared system of training, qualification and certification of NDT personnel in Polish Certification Body UDT-CERT.

The certificates of Polish specialists received under Phare’97 project were approved by the national certification body NB UDT-CERT. Persons who obtained the certificates have prepared the whole certification system in the Technical Committee of NB UDT-CERT. Validation procedures were prepared for existing in Poland diplomas, certificates and competences confirmations in NDT.

With recommendation our Society of PTBN and DT SIMP, the member of the EFNDT, the certification scheme of National Certification Body UDT-CERT for NDT personnel was approved by EFNDT as „*Registered Body*”.

EFNDT approval of UDT-CERT gives the possibility of participation in the *European Certification Program* and improvement through application of the uniform examination tests and specimens and homogeneous certification programs and NDT personnel authorization procedures according to the European law as well.

2.2 National NDT Personnel Certification System UDT-CERT aims.

National NDT Personnel Certification System UDT-CERT is governed by UDT as Persons Certification Body (in Polish - JCO UDT-CERT).

UDT as Persons Certification Body JCO UDT-CERT fulfills the requirements at first of EN 45013:1989¹⁶ and confirmed in certificate No 088 at 2002 year. In 2005 UDT as JCO UDT-CERT fulfilled the requirements of EN ISO/IEC 17024:2003 what was also confirmed by PCA competence certificate.

UDT-CERT Scheme considers the requirements EN 473:2000¹⁷, ISO 9712:2005¹⁸ and pr EN 4179:2003 Edit P3¹⁹.

UDT-CERT System considers the requirements of industry sectors, law regulations, applied good technical practices and opinions of parts connected with the certification aspects as well.

In UDT-CERT structures operate Governing Board and Scheme Committee to represent the interests of all significantly concerned with the certification scheme. Participation in these structures is open without any particular interest predominating.

It was formed National aerospace NDT board NANDTB (in Polish – CPL) working as Polish national aerospace board and as aerospace subcommittee within Scheme Committee of the JCO UDT-CERT (certification body) basis on the mutual agreement between the President of Office of Technical Inspection (UDT) and the President of Civil Aviation Office (ULC). CPL is in favour of establishing an aerospace NDT Board forum under the umbrella of the European Federation for NDT and will be participate at a formative meeting during the 9th European Conference on NDT in Berlin in September 2006.

National UDT-CERT System for NDT Personnel is called full certification and fulfill 5 NDT methods: MT - magnetic particle testing, VT - visual testing, PT - penetrant testing, RT - radiographic testing, UT - ultrasonic testing of 3 levels and industrial sectors [6] – metal manufacturing (combining castings, forgings, tubes and pipes, welded products, and wrought products) and [7] – pre- and in-service testing of equipment, plant and structure (combining as at [6]).

The scheme is being used as a limited certification also for limited in applications of NDT methods:

UTT – ultrasonic measurement of thickness, level 1 and 2, in [6] and [7] sectors,

RTI - interpretation and evaluation of radiographs, level 1, in sectors: [1] – castings, [3] – welded products and [6] and [7],

MRT (MRT)– magnetic testing of steel ropes during fabrication and maintenance, level 1 and 2, in sector [10] – steel ropes.

The Scheme Committee elaborated the general certification scheme and detailed scheme for each method / application. The detailed schemes contain certification requirements, specific for each method. For each published document additional comments are enclosed (if necessary).

The NDT personnel certification in two industrial sectors [6], [7] is considered by UDT-CERT as certification in the following product sectors: castings [1], forgings [2], welded products [3], tubes and pipes, including flat products for the manufacturing of welded pipes [4], wrought products [5].

JCO UDT-CERT maintaining sole ownership of the certificates. Certified persons shall have to operating authorization by employer in accordance with the chapter 5.3 in EN 473:2000 (in Polish - PN-EN 473:2002).

The candidate/ person certified according to UDT-CERT System, without consideration of the level / scope of certification, is responsible for:

- filling of application form with actual required data,
- complying with ethic codes conditions and proper certification scheme rules,

- informing JCO UDT-CERT while restrictions appear or following regulations of UDT-CERT fulfillment are not possible including changes e.g. employer,
- keeping documentary evidence of the NDT practice continuity corresponding to the method, level and sector for which he is certified, without the significant interruption.

The candidate should cover basic requirements concerning:

- education,
- training,
- industrial NDT experience in the method, sector and level concerned,
- evidence of satisfactory vision,
- passing the suitable examination.

EN 473:2000, ISO 9712:2005(E) and EN 4197 standards do not require proper education of the candidate to be certified. In the UDT-CERT scheme there is an additional condition/concerning minimal education of candidate to be eligible for certification.

2.3 Certification process description

No matter what level of the certification is considered – the candidate may be certified according to various possible course of the certification process.

Variant A - proper education, training course, required industrial NDT experience, filling application form, paying for certification, passing exam, decision and issuing of certificate, or

Variant B - proper education, required industrial NDT experience, training course, filling application form, pay for certification, passing exam, decision and issuing of certificate, or

Variant C - proper education, training course, filling application form, paying for certification, passing exam, required industrial NDT experience, certification decision which is suspended to obtain the required experience).

Certification process is realized in accordance with the certification scheme published on UDT website www.udt.gov.pl in appliance with personnel qualification quality system procedures.

2.4 Training, examination and decision

UDT-CERT System fulfills certification and training schemes compatibility condition. JCO UDT-CERT is confirmed by the training schemes evaluation and surveillance processes and training is independent of the evaluation.

The JCO UDT-CERT requirements to the training courses are the basis for evaluation of the training centers.

The 8 training centers in Poland conduct the training courses according to the evaluation schemes/syllabuses. The training courses are conducted lectures and instructors holders the JCO UDT-CERT certificates in the appropriate methods and industrial sectors, and / or persons with an acknowledged horizontal knowledge, e.g. science officers of the technical colleges or the scientific and research centers.

The NDT equipment in the training centers fulfills proper requirements (e.g. law, standards, technical specification regulations).

JCO UDT-CERT published also the guide for the evaluation of the examination centers, which present the basic requirements. The training centers are often transformed into the examination centers for the examination time.

Examiners appointed by the Manager of JCO UDT-CERT should meet the proper criterion, e.g. to keep valid level 3 certification in the method and sector he is exam, obtained in the JCO UDT-CERT. 21 examiners are currently working in the JCO UDT-CERT. The decision on certification of a candidate is made solely by the JCO UDT-CERT on the basis of the information gathered during the certification process and the person who makes this decision did not participate in the examination or training of the candidate.

The JCO UDT-CERT defined the surveillance process to monitor the certification persons compliance with relevant provisions of the certification scheme and the recertification process.

After 5 years from the effective date of certification the validity of certification expires. Certification can be renewed after the first (5 years) period of validity and every ten years thereafter when all the conditions are performed. After each second period of validity certification is renewed (recertification) for the next 5 years on the basis of the JCO UDT-CERT requirements.

The JCO UDT-CERT is the biggest NDT Personnel Certification Body in Poland. It has issued over 1400 certificates in the different methods and levels.

3. UDT activities as Recognized Third Party Organization for NDT personnel

The persons, who have the certification in NDT according to the UDT-CERT Scheme or EN 473:2000 (issued by the JCO UDT-CERT or other Certification Bodies), the training in PED field finished, the exam according to UDT –CERT requirements passed and the proper industrial NDT experience, after filling application form, obtain the approval to perform non-destructive tests of permanent joints pursuant to PED, Annex I, sections 3.1.3.

The UDT as the Recognized Third Party Organization for NDT personnel, has also the procedures for approval persons, who don't have certification in NDT or have the certification according to standards other than EN 473:2000.

- ¹¹ Directive 97/23/EC of the European Parliament and on the Council of 29 May 1997 on the approximation of the laws of the Member States concerning pressure equipment, (OJ L 181, 9.7.1997, p. 1)
- ²² Council Directive of 29 June 1990 on the approximation of the laws of the Member States relating to appliances burning gaseous fuels (90/396/EEC), (OJ L 196, 26.7.1990, p. 15)
- ³³ European Parliament and on the Council Directive 95/16/EC of 29 June 1995 on the approximation of the laws of the Member States relating to lifts, (OJ L 213, 7.9.1995, p. 1)
- ⁴⁴ Council Directive of 25 June 1987 on the harmonization of the laws of the Member States relating to simple pressure vessels (87/404/EEC), (OJ L 220, 8.8.1987, p. 48)
- ⁵⁵ Council Directive of 29 June 1990 on the approximation of the laws of the Member States relating to appliances burning gaseous fuels (90/396/EEC), (OJ L 196, 26.7.1990, p. 15)
- ⁶⁶ Council Directive of 19 February 1973 on the harmonization of the laws of Member States relating to electrical equipment designed for use within certain voltage limits (73/23/EEC), (OJ L 77, 26.3.1973, p. 29)
- ⁷⁷ Directive 98/37/EC of the European Parliament and on the Council of 22 June 1998 on the approximation of the laws of the Member States relating to machinery, (OJ L 207, 23.7.1998, p. 1)
- ⁸⁸ Directive 94/9/EC of the European Parliament and on the Council of 23 March 1994 on the approximation of the laws of the Member States concerning equipment and protective systems intended for use in potentially explosive atmospheres, (OJ L 100, 19.4.1994, p. 1)
- ⁹⁹ Directive 2000/14/EC of the European Parliament and of the Council of 8 May 2000 on the approximation of the laws of the Member States relating to the noise emission in the environment by equipment for use outdoors
- ¹⁰¹⁰ Council Directive 1999/36/EC of 29 April 1999 on transportable pressure equipment, (OJ L 138, 1.6.1999, p. 20)
- ¹¹¹¹ Council Directive of 3 May 1989 on the approximation of the laws of the Member States relating to electromagnetic compatibility (89/336/EEC), (OJ L 139, 23.5.1989, p. 19)
- ¹² EN 45012:1998 General requirements for bodies operating assessment and certification/registration of quality systems
- ¹³ EN ISO/IEC 17024:2003 General requirements for bodies operating certification of persons
- ¹⁴ EN 45011:1998 General requirements for bodies operating product certification systems
- ¹⁵¹⁵ EN 473:1993 Qualification and certification of NDT personnel – General principles
- ¹⁶ EN 45013:1989 General criteria for certification bodies operating certification of personnel
- ¹⁷ EN 473:2000 Non destructive testing - Qualification and certification of NDT personnel – General principles
- ¹⁸ ISO 9712:2005 Non-destructive testing. Qualification and certification of personnel
- ¹⁹ pr EN 4179 Edit P3:2003 Aerospace series. Qualification and approval of personnel for non-destructive testing