Abstract
The objective of this paper is comparative analysis of the systems applied in Ukraine for qualification and certification of personnel in non-destructive testing (NDT) in the view of their compliance with requirements of the standards ISO/IEC 17024 “Conformity assessment - General Requirements for Bodies operating Certification of Persons”, EN473:2008 «Qualification and certification of NDT personnel – General principles» и ISO 9712 «Non-Destructive Testing – Qualification and Certification of NDT Personnel”. The requirements to qualification and certification of NDT persons being in force in the spheres of obligatory and facultative certifications in the different industries and authorities of Ukraine were analyzed. Under consideration were listing of sectors used in different certification fields and their conformity to requirements of national and international norm, rules and standards. Recertification matters, repeated certification and manual recognition of NDT certificates issued by national and foreign personnel certification bodies were covered. Implementation of certification scheme into the NDT practice in Ukraine according to the requirements of ISO 17024 and EN473:2008 has allowed optimizing requirements to training level, procedures for qualification and certification of Ukrainian NDT persons working in different industries.

Keywords: qualification and certification, NDT personnel, bodies operating certification of persons

1. Introduction

In the paper there are systems for determination of qualification of non-destructive testing (NDT) personnel existing in various industries of Ukraine, issues of independence of inspection bodies conducting qualification and certification of these personnel, as well as issues of application of national and foreign NDT regulatory documentation in the processes of training, qualification and certification of personnel considered.

At the present time, qualification of NDT personnel in Ukraine is defined by two basic schemes: by the employer on working categories according to the operating in Ukraine “Standard Wage-Rates and Skills Reference Book” (SWRSRB) (without certification, in contrast to schemes used by foreign employers) and certification of experts by independent personnel certification bodies (PCB) for qualification levels in accordance with the current in Ukraine “Classifier of occupations” DK 003-95 and EN473 standard or harmonized with this standard departmental documents.

The certification of personnel for a bit grid is carried out by examination boards of organizations, led by the heads of these organizations or their subdivisions, carrying out the testing of products produced by the organization. The work of these boards is conducted in the absence of uniform rules of knowledge evaluation, methods, programs and qualification procedures, single database of test questions, requirements to test specimens, etc. One of the most essential faults of such job evaluation system of personnel is the human factor of examination boards and lack of their independence from the employer, on what foreign experts at various rank international meetings and conferences on NDT specified, and also in conclusion of various agreements on equipment deliveries, service provisioning and investments into the industry of Ukraine. The last condition now has become of particular importance in connection with the entrance of Ukraine to the World Trade Organization (WTO) and nation - wide policy directed into the European Community integration, and also in connection with the adoption by Ukraine as national a wide range of (acting at the present moment more than 50) European Norms on various NDT techniques and NDT personnel certification procedures. In order to increase the effectiveness of NDT personnel system
certification was introduced centralized training by the employer in some industries and certification of members of examination boards, that somewhat optimized this system within the industry, but didn’t solve basic issues concerning the independence and subjectivity of examination boards. In Ukraine, the certification system of NDT personnel by the employer has survived to the present moment in such industries as: atomic power engineering, metallurgy, railway transport, but even in these fields tendencies for application of the system of NDT personnel certification laid down by independent bodies.

2. NDT personnel certification by independent PCB

For determination of NDT personnel qualification the certification of NDT personnel by independent PCB is also widely used in Ukraine, as in the facultative certification and in the legislatively regulated sphere.

Besides EN 473:2008 and ISO 9712 standards, in some industries in Europe and in other countries for NDT personnel certification are applied standards establishing specific to this field demands for NDT personnel qualification (in other words – departmental rules). ISO 11484 standard set demands to qualification and certification of personnel engaged in NDT of weld-free and welded pipes, including flat section which is used in pressure pipe production. This standard assumes the conduction of NDT personnel certification as by the employer and by independent examination boards. Investigation showed that ISO 11484 structure in many instances is similar to EN 473. Certification of personnel carrying out NDT in the field of aeronautical engineering is conducted in compliance with EN 4179:2000 standards, separate regulations of which fundamentally differ from EN 473:2008 requirements. There are also separate documents that are in varying degrees regarding to the certification of NDT personnel in atomic power engineering.

In the facultative certification sphere NDT personnel are certified as a rule, in accordance with the requirements of EN 473 standard, in legislation regulated sphere according to departmental rules, harmonized with the mentioned standard. Three-level system of NDT personnel certification is applied for objects supervised by the Gosgorpromnadzor in aeronautical engineering, in shipbuilding, in mechanical engineering.

Basic procedures which are used by Ukrainian PCB for NDT personnel certification, practically don’t differ from similar procedures used by foreign PCB, but the next aspect should be noted. Some foreign accreditation bodies threat PCB accreditation in accordance with the requirements of ISO/IEC 17024:2003 and EN 473 as the need to apply only European EN Standards on testing methods at conducting of special and practical tests and not the current in this country national regulatory documentation (RD) on NDT, although the text of mentioned standards do not contain requirements or guidance on carrying out of tests for knowledge monitoring of specific RD on NDT and ability to test the product in accordance with the requirements of this particular RD. The given requirement is certainly true in terms of inspection of objects by certified experts, the NDT conduction of whose is regulated by EN standards (basically in European countries), but it doesn’t befit to countries where these standards practically are not used or just begin to take root and the NTD bulk is carried out according to the national RD (Ukraine, Russia, Belarus and other eastern European countries).

As a result of such approach at carrying out of PCB auditing out of view of foreign accredited bodies remain (not controlled) almost all aspects of PCB activity and included in its system training (TC) and examination (ECNTD) centers, connected with training, qualification and certification in accordance with the requirements of national RD on NDT. Alternative to this approach is creation of departmental documents on certification of NDT personnel, harmonized with the requirements of ISO/IEC 17024:2003 and EN 473, i.e. using advanced procedures of these standards relating to the requirements and structure of national RD, as well as considering the field or department specificity. It is natural, that the structure of industrial sectors in these documents will differ from regulated by EN 473:2008 standard.
Before the transition to the wide-ranging application in Ukraine of EN standards for testing, the way of creation of departmental documents in Ukraine, harmonized with EN 473 is appeared to be the most reasonable and promising in terms of implementation of up-to-date requirements to NDT quality with consideration of specific characteristics of a particular branch.

In legislatively regulated sphere in accordance with the European Directive 97/23/EU (PED) in EU member states the non-destructive testing of welded joints of equipment of III and IV categories working under the pressure (boilers, vessels, pipelines and etc.), have the right to perform personnel which are certified in accordance with the requirements of EN 473 standard of so-called “Third Party Organization” (RTPO) - organization, recognized as the EU member state in accordance with the Article 13 PED (i.e., having the authority to certify NDT experts in legislatively regulated sphere). Testing of mentioned welded joints can also implement NDT personnel, certified in accordance with EN 473 and other PCB – Non-RTPO organizations, but in this case its competence for carrying out NDT in accordance with the requirements of PED in any way should be confirmed by the PTPO organization by special procedures. Necessary condition for such conformation is the presence of the certificate on a certain NDT method in particular industrial sectors, issued in compliance with requirements of EN 473 standard accredited by the PCB. RTPO confirmation can be also represented to experts certified not by EN 473 standard, but in this case the confirmation procedure becomes more complicated. Mentioned confirmation procedure of issued by Ukrainian PCB certificates by PTPO organizations is also applied in Ukraine, where the British Institute of Non-Destruction Testing (BINDT) acts as RTPO organization. At the present moment by the law of Ukraine “On Standards, Technical Rules and Confirmation Procedures of Correspondence” the procedure for the appointment of bodies for NDT-personnel certification is also regulated to perform work in legislatively regulated sphere (in compliance with Ukrainian technical rules on equipment under the pressure, harmonized with the European Directive 97/23/EU), which is similar to the recognition procedure of RTPO organizations by EU member states.

It should be noted, that almost all national and foreign PCB have their own training centers (TC) and examination centers of non-destructive testing (ECNDT), i.e. centers, working in the same organization or association as PCB or as a separate PCB division. Presence of its own TC and ECNDT provides greater autonomy and competitiveness of PCB, as well as its independence from various external influences, also from the side of involved TC and ECNDT. Consequently, PCB, having no their own TC and ECNDT, can’t be considered fully independent, as it is forced to consider interests of involved TC and ECNDT in its work, which does not always coincide with the PCB ongoing policy.

3. Conclusion

Currently, in Ukraine there are five bodies for NDT-personnel certification accredited by the National Accreditation Agency of Ukraine (NAAU). These PCB are accredited in compliance with ISO/IEC 17024-2003 standard and recognized competent at carrying out of certification in accordance with EN 473. In early November 2009, at the regular EA session the National Accreditation Agency of Ukraine is recognized by the EA and allowed to participate in EA in the sphere of certification of personnel. A multilateral agreement on mutual recognition of certification of personnel was signed on November 25th. In this way, the system of certification of NDT-personnel applied in Ukraine, got the European recognition.

In connection with the acceptance of ISO/EN 9712 joint standard the next step in the development of certification system of NDT personnel in Ukraine will be transition of bodies for NDT personnel certification to work under this standard.

References
1. ISO/IEC 17024 “Conformity assessment - General Requirements for Bodies operating Certification of Persons”.
2. EN473:2008 «Qualification and certification of NDT personnel – General principles».
3. ISO 9712 «Non-Destructive Testing – Qualification and Certification of NDT Personnel». 