

COMPETENCY CONFIRMATION OF CONFORMITY EVALUATING BODIES IN THE FIELD OF NONDESTRUCTIVE TESTING AT HAZARDOUS PRODUCTION FACILITIES

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The report contains basic statements of System of nondestructive testing at hazardous production facilities. Its creation became the important direction of realization of the Federal law «About industrial safety of hazardous production facilities» from 21.07.1997 № 116-FZ. Information on certification of the personnel, laboratories, methodical documents and means of nondestructive testing is presented in the report.

Reliable determination of remaining tool life, risk analysis of equipment operating at hazardous production facilities becomes the state problem which decision is impossible without application of methods of nondestructive testing. The role of nondestructive testing increases at equipment manufacturing and its repair. It is caused by application of high-strength steels which are more sensitive to presence of various kinds of defects, and by use of new methods of structural calculation that allow to lower safety factors considerably. At the same time use of the most perfect methods of nondestructive testing cannot guarantee quality of the checked up equipment, if the control is carried out by the not qualified expert, if not appropriate methodical documents and means of control are used and if the independent control over structural divisions of the organizations which are carrying out nondestructive testing is absent. The important role in increase of efficiency of nondestructive testing belongs to the organizational maintenance of the works which has demanded creation of System of nondestructive testing at hazardous production facilities.

Russian government by ordinance «About measures on maintenance of industrial safety at hazardous industrial facilities in territory of the Russian Federation» from 28.03.01 № 241 has charged to the Federal executive body in the field of industrial safety (these functions have been assigned to Federal environmental, industrial and nuclear supervision service of Russia) to organize works on developing of System of nondestructive testing. The task has been set for scientific community to make up conceptual positions and requirements to the system of nondestructive testing, directed on maintenance of industrial safety of hazardous production facilities. As a result of joint activity of leading experts of the most authoritative organisations in the field of nondestructive testing the «Concept of management of System of nondestructive testing and the basic directions of its development», providing certification of the personnel, laboratories, methodical documents and means of not nondestructive testing has been developed and confirmed by Rostekhnadzor of Russia.

Increase of level of operational safety of technical devices, buildings and the constructions applied and maintained at hazardous production facilities, reached at the expense of increase of reliability, reproducibility, comparability of results of nondestructive testing and acceptance of timely and adequate decisions on maintenance of industrial safety is the purpose of System of nondestructive testing of industrial safety. The system of nondestructive testing solves problems of perfection of organizational-methodical and scientific and technical maintenance of activity in the field of nondestructive testing: improvement of professional skill of the personnel, competence of laboratories, a technological level of methodical documents and means of nondestructive testing.

Works on creation and development of System of nondestructive testing were spent in three basic directions: working out of regulatory documents, formation of necessary organizational structures, information-analytical maintenance of carried out works.

Regulatory and engineering provisions

The general documents for System of nondestructive testing are: Position about System of nondestructive testing [1], defining its purpose, problems, structure and the basic functions System participants; Position about Operating council of nondestructive testing [2], which main purpose is

to work out and realize a uniform technical policy in System; Position about Council of experts of nondestructive testing [3], which main purpose is to work out the offers on perfection of works in the field of nondestructive testing on the basis of expert activity. Two types of documents are developed on each certified element (the personnel, laboratories, methodical documents and means of nondestructive testing): Position about Independent body on certification in corresponding area and certification Rules in which requirements to a certified element of System of nondestructive testing and a certification order are defined [4-11]. The leading organizations-developers of documents were scientific and technological centre «Industrial safety», IEC «Welding and the control», MNPO «Spectrum» and GNC NPO CNIITMAS.

Action of the above-stated documents extends on radiating, ultrasonic, acoustic emission, magnetic, eddy current, electric, optical, visually-measuring, getting substances, vibrodiagnostic, the thermal control at manufacturing, building, installation, repair, reconstruction, operation and examination of technical devices and constructions. At first the list of objects of the control included objects of boiler inspection, gas supply systems, elevating constructions, objects of the mining industry, objects of the coal industry, the equipment of the oil and gas industry, the iron and steel industry equipment, the equipment of fire explosive and chemically dangerous manufactures, objects of a railway transportation, objects of storage and grain processing. In 2006 list of objects has been added by building objects (metal designs, concrete and ferro-concrete designs, stone and reinforced brickworks) and by the electric power industry equipment.

Organizational maintenance and results of functioning

The system of not destroying control carries out its activity within the limits of Uniform system of an estimation of conformity in the field of industrial, ecological safety, safety in power and building (USEC) which is created according to the program confirmed by Rostehnadzor. Various evaluating bodies may confirm the competence by voluntary accreditation: bodies on certifications of the personnel, inspection bodies, bodies for certifications of production and control systems, test laboratories and others. Body on accreditation is OJSC «STC «Industrial safety». It works according to GOST R ISO/MEK 17011–2008 «The General requirements to bodies on accreditation, accrediting evaluating bodies» and signed the contract on cooperation with the European cooperation on accreditation (EA).

30 Independent bodies on certification of the personnel in the field of nondestructive testing function now. Works in the field of personnel certification, including new areas are conducted. 8 Independent bodies on certification of the personnel in the field of nondestructive testing of building objects and 2 – the electric power industry equipment are accredited. 58 examination centers are created to grade exams. More than 50 % of Independent bodies perform works not less than in 5 branches of supervision on 6 kinds (methods) of nondestructive testing. About 41500 certified experts are added to the list of System of nondestructive testing. Experts are most often certified on monitoring procedure of the equipment of oil and gas industry, objects of boiler inspection, the equipment of fire and chemically dangerous manufactures, systems of gas supply and elevating constructions (fig. 1). The personnel is most often certified at visual and measuring, ultrasonic, radiating, liquid penetrant and magnetic, i.e. traditional methods (fig. 2). Overwhelming quantity of experts (about 91 %) is certified on II skill level (fig. 3). On I skill level 8 % of experts, and on III level - 1 % are certified.

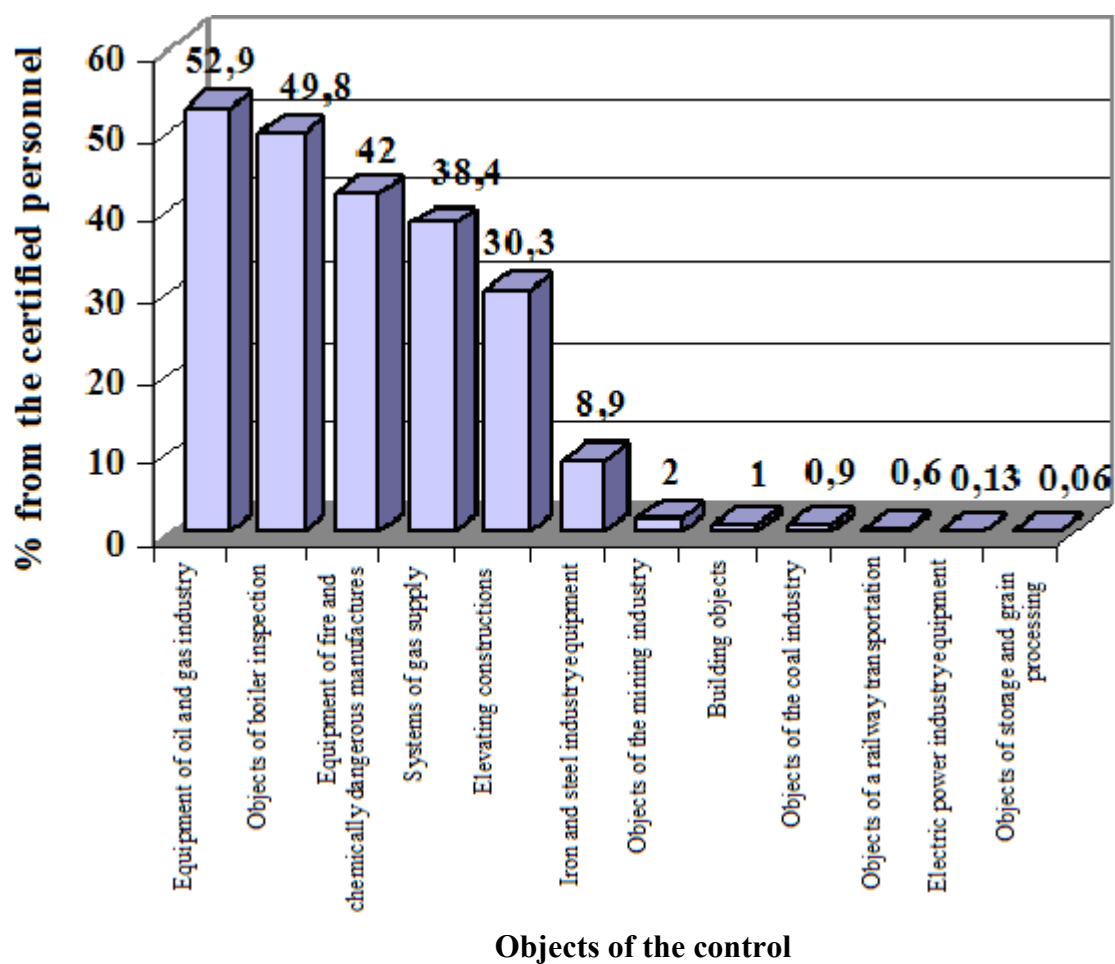
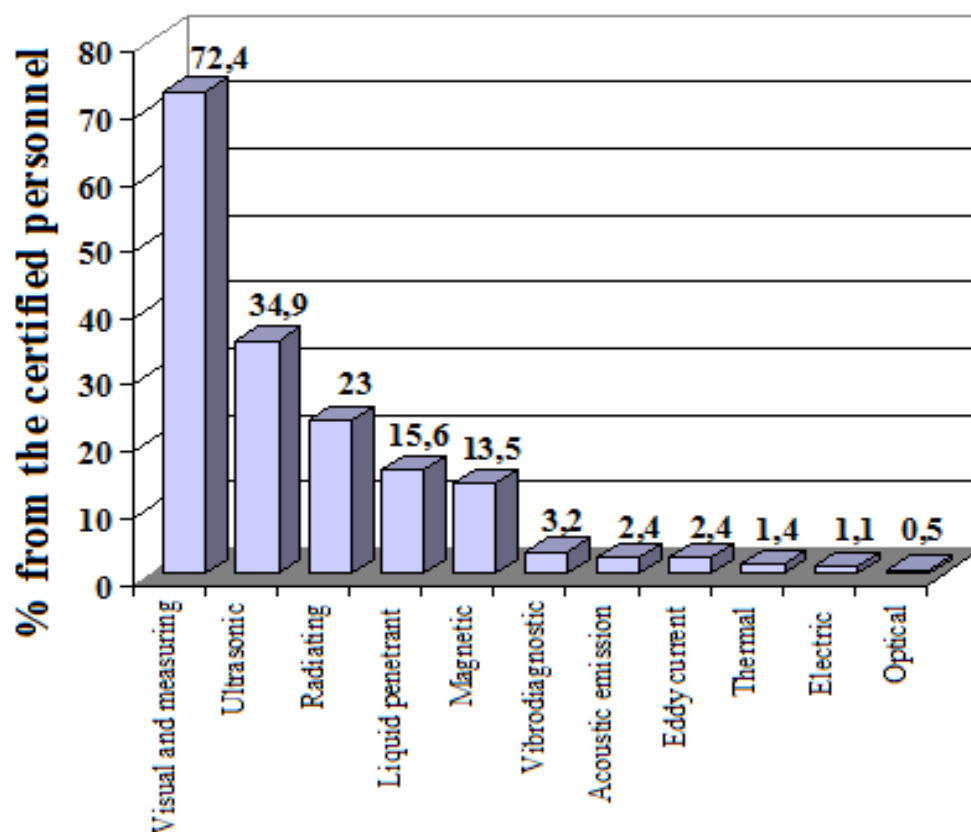


Fig. 1 - Distribution of the certified experts of nondestructive testing on objects of the control.



Kinds (methods) of control

Fig. 2 - Distribution of the certified experts of nondestructive testing by kinds (methods) of the control.

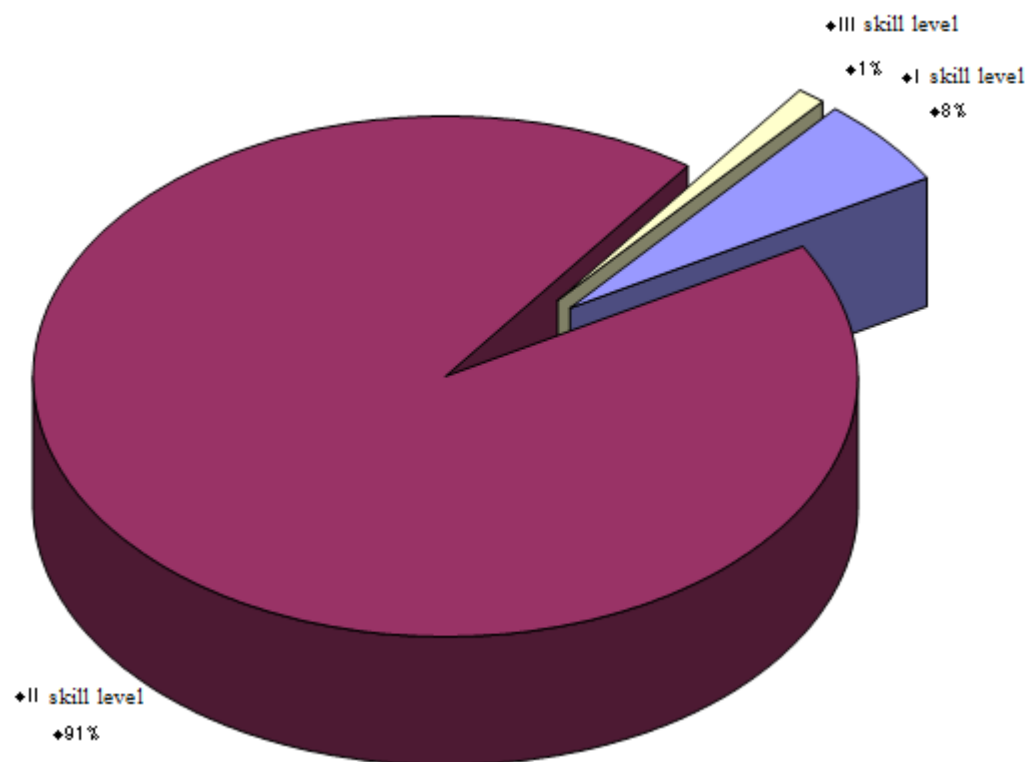


Fig. 3 - Distribution of the certified experts of nondestructive testing on skill levels.

Accreditation of Independent bodies on personnel certification is spent taking into account requirements ISO/IEC 17024:2003 «The General requirements to bodies on certification of physical persons». In 2009 Agreement on Mutual Acceptance of Personnel Certification Certificates between the Signatories to the EA Multilateral Agreement and the OJSC «STC «Industrial Safety» was signed.

40 organisations have the status of independent bodies on certification of laboratories of nondestructive testing; from them 14 have acquired the right of carrying out of certification of the laboratories which are carrying out not destroying control of building objects and 3 – the electric power industry equipment. Works on nondestructive testing within the limits of The System are carried out by 3500 laboratories. The total number of the certified laboratories constantly increases. Laboratories are integrating thus. The small organizations often do not create own laboratories, and prefer to employ laboratories which have already confirmed the competence. The most popular objects of the control, included in the area of certification, are: objects of boiler inspection, gas supply systems, the equipment of the oil and gas industry, the equipment of fire and chemically dangerous manufactures, elevating constructions (fig. 4). Most laboratories, as well as personnel, are certified on carrying out of the visual and measuring control, ultrasonic, radiating, getting substances and the magnetic control (fig. 5). Works on certification of laboratories became even more actual after introduction of the Federal law «About licensing of separate kinds of activity» by which the list of licensed kinds of activity is considerably reduced, including, licensing of works on carrying out of not destroying control at manufacturing, building, repair (reconstruction), installation and operation of technical devices and constructions on dangerous industrial objects is much reduced.

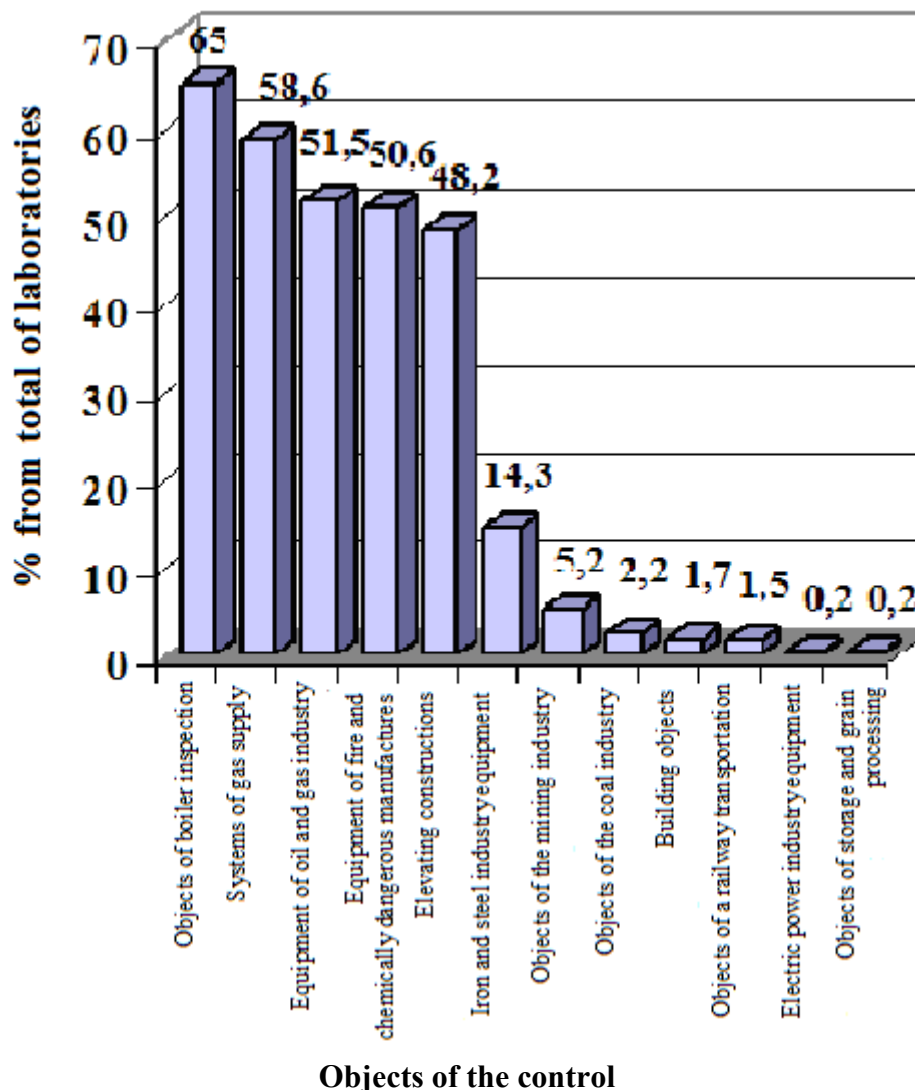


Fig. 4 - Distribution of the certified laboratories of nondestructive testing on objects of the control.

According to the conditions of USEC accreditation of laboratories of nondestructive testing on conformity to requirements of SDA-15-2008 «Requirements to test laboratories» and GOST R ISO/MEK 17025 «Requirements to test and calibration laboratories» has started. The purpose of this process is harmonization of procedures of accreditation in USEC with the European and international requirements and creation of conditions on an acceptance of results of activity of laboratories by the countries which have signed the multilateral agreement with the European cooperation on accreditation. More than 100 test laboratories of nondestructive testing are accredited now.

Works on certification of methodical documents and means of nondestructive testing are in an initial stage of development. Strengthening of positions of this segment is one of directions of development of System of nondestructive testing. 4 Independent bodies on certification of methodical documents and 2 - on certification of means of nondestructive testing function now.

Information-analytical maintenance of works

OJSC «STC «Industrial safety» conducts lists of the accredited Independent bodies and the certified laboratories, the personnel, methodical documents and means of nondestructive testing. The current information on functioning of System of nondestructive testing, on normative-technical documentation being developed, on formation of necessary organizational structures takes places on OJSC «STC «Industrial safety» web-site www.oaontc.ru. The handbook on terminology in the field of nondestructive testing and 4 languid collection of the international and national standards in the field of nondestructive testing is published. Supervising documents on visually-measuring, acoustic emission, thermal, eddy current, capillary and magnetic particle control of technical devices and the constructions applied and maintained at hazardous industrial facilities are developed.

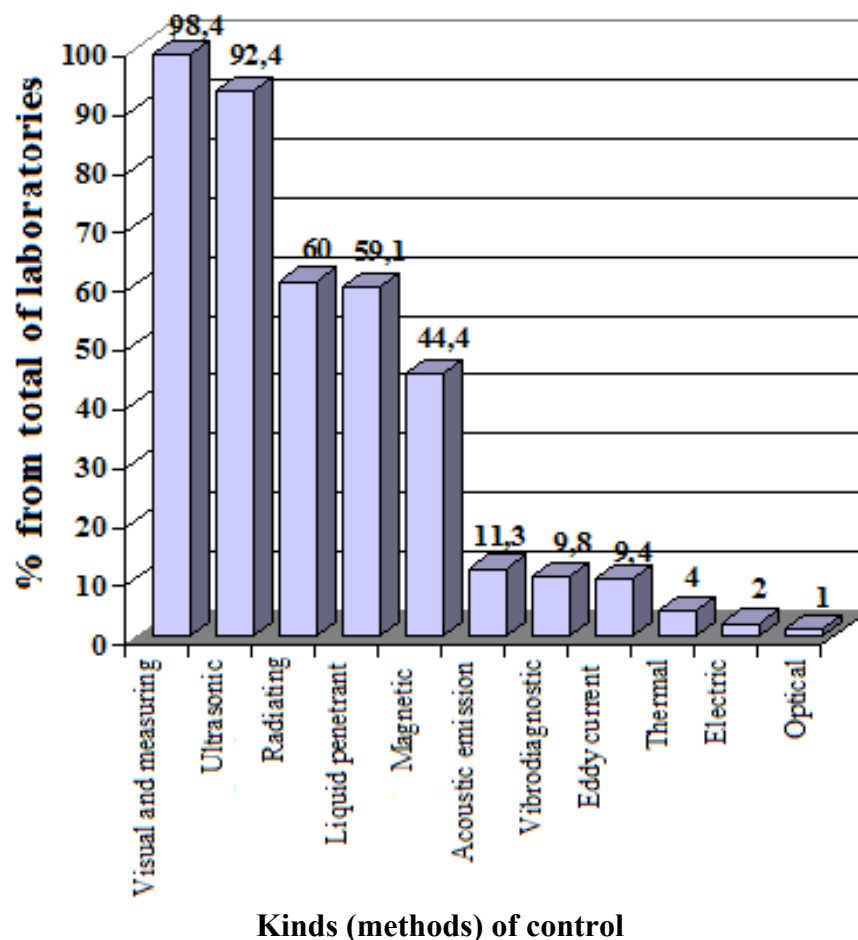


Fig.5 - Distribution of the certified laboratories of nondestructive testing by kinds (methods) of the control.

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