

5.1.6. FORMING OF RESEARCH AND EDUCATION ENVIRONMENT OF WORLD LEVEL IN THE FIELD OF NON-DESTRUCTIVE TESTING ON THE BASE OF THE CENTRE FOR ADVANCED TRAINING OF NDT EXPERTS IN TOMSK POLYTECHNICAL UNIVERSITY

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Today, it is impossible to call any field of technique without NDT usage. Naturally, that further development of given branch one cannot do without training of high-qualified NDT experts. In Tomsk Polytechnic University, the educational-research and production complex (ERPC) has been formed for providing the fulfillment of scientific investigations in the field of NDT and technical diagnostics (TD) and also development, manufacturing and introduction of new technique of NDT and TD, training of bachelors, masters and engineers within the sphere of NDT as well as training for higher levels of Doctors and Candidates. The additional training and courses for improving the NDT expert's qualification and the certification of NDT personnel are also included in the working activity of the ERPC. Now, the reached level of the research and educational process within ERPC allowed us to win the State Grant in the Direction "Advanced training of the elitist specialists and teams of world level professionals in the field of NDT and TD".

The process of reaching the IEP aims requires to make the modernization of all the stages of the educational process concerning the development of Master's programs, selection of personnel, post-graduating additional training, etc.

The international level of the educational process requires to approve it with the requirements of the Bologna Declaration oriented toward the so-called competency method of approach the Master Program's development. The structure and content of given Programs are determined by the international engineering organizations and NDT certification agencies including the Russian Association for Engineering Education and, significantly, by the industry enterprises interested in the graduating students. The system of contacts with different organizations and consumers and the realization of the IEP tasks are now carried out by means of the Centre for Advanced Training of NDT Experts which was formed due to the IEP.

The Innovative scientific and educational Centre for Advanced Training of NDT Experts of TPU (see fig. 1) unites the structural branches of the Research Institute of In-tros-copy of TPU and departments of Electro-physical faculty.

The Centre represents the further development of the ERPC complex. Different laboratories of the Centre are supplied with new-type equipment of native and foreign produce. That allows to solve the broad circle of problems concerning the different aspects of training and qualification improving connected with the modern NDT technologies. More over, one has significant possibilities to apply the equipment of the Centre for testing materials, articles, mechanisms and objects and for scientific investigations. The centre has a sum of devices and equipment with unique characteristics produced by the leading world manufacturers: Olympus NDT; Time Group Inc; Krautkramer; Flir; Mistras Holding Company; Durr NDT and so on. For IEP realization, about 60 text books, study aids, laboratory practices were prepared and composed by the workers of Electro-physical Department of TPU. All of methodical materials concern the theory and practice of main kids and methods of NDT.

The total set of normative documents including the industrial safety providing, NDT standards etc, being in force at Russia Federation territory (Federal laws, standards, Directional documents, Norms and Rules) was formed within the Centre structure. Also, more over than 100 normative documents and NDT standards being in force at the European Union territory (documents of EN, DIN, ISO series), the significant set of the ASNT documents in English were bought by the Centre authorities, including text books, train-

ing appliances, standards, Norms and Regulations aimed for the NDT personnel certification. Also, the modern program products were bought and developed. Firstly, one must mark the ANSYS program.

The following Master's programs were prepared:

1. Devices and methods of quality testing and diagnostics.
2. Acoustic devices and NDT systems.
3. Informative and measuring technique and technologies in NDT.
4. Tomography.

The basis for development and modernization of Master's programs are:

- orientation on the graduating students competency as the learning result (Learning Output- based Approach);
- using of the European Credit Transfer System for competency estimation and didactic units estimation providing the reaching of competencies;
- taking into attention the system of ISO 9001:2000 standards, EU standards Directional documents for providing the quality of high education within Bologna process and national and international quality criteria of educational programs.