

# Certification of Personnel Performing Automated Non-Destructive Testing of Pipes and Flat Products. Problems and Solutions

Nadezhda VOLKOVA, Alexander MULLIN, Svetlana LAGUTINA, Natalia MAKOVCHUK,  
RTC Testing and Diagnostics, Moscow, Russia

## Introduction

For today automation of NDT processes is one of main trends. Russian manufacturers of steel pipes (including seamless) and flat products give more and more preference to multifunctional automated NDT systems providing for high performance and reliability of methods applied.

To purchase and deploy high-priced automated NDT equipment manufacturer should also be in possession of sufficient number of qualified staff which is not only aware of theoretical basis of methods applied but also have practice of the system application.

Increase of automation level requires for higher qualification of specialists. Thus it is clear that employer should be interested in validation of his employees qualification level.

## Problems and solutions

More and more Russian enterprises feel concern with certification scheme for specialists working at automated NDT installations. For today ISO 11484 document set requirements to qualification and certification of personnel employed in the sphere of NDT of seamless and welded pipes, including flat products for manufacturing of pressure pipes. The Standard provides for NDT personnel certification as by employer so as by independent certification bodies. But in Russian practice only independent third party certification takes place, while Certification Bodies function in accordance with EN 473 and/or ISO 9712. Analysis conducted reveal that framework of ISO 11484 is similar to that of EN 473 in many details.

ISO 11484 also provides that applicant should pass three parts of qualification examination – general, specific and practical. However Standard requirements to examination organization and firstly to its practical part do not give clear indication of its' procedure.

So certification bodies should set up their own clear and detailed procedure enabling to evaluate actual qualification level of a specialist which will meet real NDT process.

As for procedure of general and specific examinations Certification body of the Research Training Center (RTC) “Testing and Diagnostics” possesses sufficient database of examination questions of various complexity for testing of applicants theoretical knowledge. Under the commission of Certification Body a team of examiners and experts in cooperation with

manufacturer representatives developed additional set of questions for specific examination in order to improve exam procedure for automated NDT issues. Questions developed cover specific requirements to automated testing procedure and are addressed to check applicants knowledge of testing techniques and European norms for testing performance. Introduction of mentioned set of questions enables examiners to evaluate knowledge of procedure and automated testing specifics with high accuracy.

In the course of development of practical examination procedure RTC specialists have encountered several significant issues. According to ISO 11484 “practical part should be of sufficient duration, complexity and scope for adequate testing of applicant abilities to apply method and/or technique of NDT in actual practice”. With that Standard does not specify type of test specimen and their number as well as duration of examination, procedure of assessment, etc.

Besides that at operating enterprise to conduct “actual situation” practical examination seems quite unlikely because of impossibility to shutdown facilities for the period of examination. At the same time mounting of automated installations at examination centers is unpractical due to their high price and unique character of said installation for each specific manufacture. Also customer is interested in training and certification of his personnel at the equipment applied at his plant.

In Russia two kinds of specialists – maintenance engineers and operators – work at automated NDT installations. Unfortunately certification of operators does not fit into generally accepted pattern as they do not set testing parameters but only perform testing and reject defected output products. Besides that there are two types of automated NDT installations – collecting and recording testing data in digital format and indicator type installations informing about faults detected in monitored entity. For the first case the same approach as for acoustic emission is applicable – interpretation of testing records while for the second case availability of actual test specimen is required.

It is known that specimen should have defects, that can be detected unambiguously, and should be suitable for testing by automated installations. Also in accordance with ISO 11484 specimen should be selected and checked by specialists of personnel Certification Body.

Thereby Certification Bodies are assigned a mission to supply exam centers with sufficient amount of actual flawed pipes and flat material with dimensions enabling performance of testing at automated installations, e.g. pipes up to 12 m in length and diameter up to 800 mm as well as flat material for manufacturing of these pipes.

Long-continued cooperation of RTC “Testing and Diagnostics” with leading manufacturing plants let us develop a scheme of practical examination suitable as for manufacturing plants so as for exam centers. In the scheme applicant enterprise plays certain role in organization of practical examination particularly in provision of process with exam specimen.

From the moment of signing of contract for specialists certification between Customer (Manufacturer) and Certification Body all pipes and flat material with intolerable flaws detected should be stored by Manufacturer for further application as exam specimen. The Manufacturer should assign a person responsible for preservation of confidentiality concerning defects in stored specimen. As a rule the process of accumulation of needed number of specimen is lasting not more than three months. Required number of specimen depends on number of applicants for certification.

For confirmation of testing results correctness all pipes and flat material provided for testing should be re-tested with manual methods by assigned examiners or by separate specialists with qualification not less than of II level. Quite similar to procedure set by EN 473 from results of testing by II-level specialist, individual number should be assigned for each specimen and appropriate certificate should be drawn up by III-level specialist. In such a way Certification Body obtains exam specimen with unambiguously detected defects while dimensions and shape of specimen used meet requirements of the Customer. The specimen obtained may be used at the plant for the next examination also.

RTC “Testing and Diagnostics” continues improvement of certification procedures for personnel employed at automated testing installations. Actual procedures for performance of practical examination are revised by our specialists from the results of exams conducted as well as with due consideration of customer notes and proposals.

Also requirements of accreditation authority are of great value to us. It is quite clear that accreditation authorities have their own requirements to practical examinations process performance. So Certification Body is obliged to demonstrate continuously to auditors that developed and applied procedure is addressed to real assessment of automated facility operators qualification and that the examination itself is conducted in fair and impartial manner.

## **Conclusion**

We believe that in the framework of EFNDT certain directive documents may be developed explaining procedure of conduct of practical examinations for automated testing methods. Issuance of said documents will facilitate in solving of various current problems as for certification bodies so as for applicant organizations. Also availability of standard requirements and rules may avoid certain conflicts between Certification bodies and Accreditation authorities.

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