

1.7.24. ANALYSIS OF THE MAIN FACTORS THAT DETERMINE THE QUALITY AE TESTING INDUSTRIAL EQUIPMENT

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Introduction. The paper discusses the main factors determining the success of the use of AE method for testing of industrial equipment.

The analysis is based on the experience of introducing the AE method in the traditional structure of NDT methods on the example of the activity the specialists of the oil refinery "Kirishinefteorgsintez".

Results. NDT is the main means of achieving reliable information about industrial pressure vessels and piping. This information is necessary for industry and environmental safety provision of potentially dangerous processes. Kirishi refinery is the largest one in North-West of Russia. It processes 22 billion tons of crude oil per year. There are several thousands of pressure vessels at the refinery and they are the main objects for AE testing at the plant.

Since 1992 we have tested more than 800 vessels (including pneumatic tests accompanied by AE method). According the results AE tests more than 70 vessels were repaired or replaced.

Some examples of defect detection during AE testing of the refinery's technological objects are presented in this paper.

Currently, the AE method is one of the main NDT methods used at Kirishi refinery.

For the AE method found a place in the schemes of complex testing.

It is well known that testing procedure during consecutive applications of several NDT methods is optimal, if methods with maximal speed of earning information are used first. Probably, AE method has no match with this qualitative characteristic.

AE method may be used as the basis in complex testing due to this performance and other unique properties, such as the capability to integral testing of large constructions and the detection of defects with potential for growth.

Our practice demonstrates that AE method (despite the fact that results interpretation are rather complicated) can become an important part of refinery NDT department. Moreover, it is quite reasonable for the large petroleum and chemical industries where large number of equipment (pressure vessels, storage tanks, piping which must be tested) to have specialized AE laboratory.

Discussion. In the article the following have been analyzed: the main factors determining the possibility of the successful use of AE method for testing of large industrial pressure vessels (quality of system for testing and tools to analyze data; level of specialists competency; the policy of the companies management in the field of industry safety; degree responsibility of AE specialists for testing results and others).

Some problems of AE application for testing industrial pressure vessels and possible solutions of these problems are presented.

Usage of new NDT methods, such as AE method, gives a chance to improve traditional NDT structure of industrial objects in essence. Such improvements could include:

- Considerable growths of testing volume without increasing testing time;
- Testing of previously inaccessible parts of constructions;
- Increased effectiveness of traditional NDT methods;
- Possibility to obtain new diagnostic information, for example, information about flaws growing.

The complicated testing methods such as AE have the best perspective in solving really complicated tasks, or tasks that can not be solved by other NDT methods.

Also, the paper addresses the principle of software building for data analysis, implemented in the system AMSY5 ("Vallen Systeme"), which enables the user with flexible procedures, to create unique tools for interpretation of test results.