

1.12.13. STATE AND PERSPECTIVES MEASURING AUTOMATED ULTRASONIC INSPECTION OF NUCLEAR REACTORS EQUIPMENT

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Methods allowing identifying real flaws geometry are being defined among modern automated ultrasonic inspection methods used in the nuclear power plants. It is possible to define flaws geometry with high accuracy using designed in the Scientific and Production Center "ECHO+" measuring automated ultrasonic inspection algorithms with coherent data processing. Sizes determination inaccuracy is about λ (the ultrasonic wave length). In practice this inspection is executed by scan piezoelectric transducers only along one coherent axis for optimization automated ultrasonic inspection velocity. This allows defining flaw height (the most important parameter in defectometry) with high accuracy.

The systems series AUGUR for automated ultrasonic inspection were developed in the SPC "ECHO+" to provide nuclear power plant pipe welded joints inspection. These systems permit to get the real deflectors sizes. And with it flaws conventional sizes and equivalent squares are detected also during the searching regime of automated ultrasonic inspection. Thus provides the welded joints assessment by Russian operating nuclear power plant norms.

This article describes comparison results of searching and measuring welded joints automated ultrasonic inspection, analyzes revealed flaws parameters, control sensitivity and verification. Also inspection inaccuracy data and holding monitoring some real welded joints of the nuclear power plant equipment data are presented.

The systems series AUGUR further improvement and optimization of the inspection methodologies connect with widening of their using for other nuclear power plants objects inspection and automated ultrasonic inspection time reduction without loss revealed flaws validity and accuracy measurements parameters.

Report considered examples of the designed automated ultrasonic inspection nuclear power plant equipment methodologies. Characteristics of their tests and qualifications are described. Also flaws acoustic images in different nuclear power plant objects are given. Automated ultrasonic inspection results are matched with data of welded joints destroying inspection.