1.3.53. ALGORITHMS AND SOFTWARE DEVELOPMENT FOR WELDS AUTOMATED ULTRASONIC INSPECTION BASING ON PHASED ARRAYS

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Using several directions many angled techniques while automated ultrasonic inspection (with reflection from controlled object borders accounting) allows getting additional information about flaws location and geometry. Coherent data processing methods designed in the SPC "ECHO+" for many angled inspection schemes with several transducers [1, 2] are used in the ultrasonic inspection of important welded joints of nuclear power plant equipment.

Phased array technology uses in increasing frequency in the ultrasonic inspection at the moment. This report describes main perspectives of using phased arrays during welded joint automated ultrasonic inspection on the nuclear power plants. Also algorithms software development necessity for the inspection were analyzed.

At the moment in the SPC “ECHO+” many angled data processing algorithms are designed and introduced. Echo signals processing by multifunction SAFT method is perspective if signals have been received using phased arrays in the double scan mode accounting reflections from inspection object borders [3]. Such approximation allows getting high-quality defect images. In turn it raises reliability of automation recognition and flaw measuring process.

Results of the models and real welded joints inspection are given in the report. Automated ultrasonic inspection data allow getting information about defects dimensions and location and about welded joint configuration (its form and inner surface cutting). Using phased arrays allows solving problems of detection and flaw height and length measuring and identifying real configuration of inspected welded joint.

Results of the using automatic analysis acoustic coupling quality algorithms, welded joint flaw zones searching, and flaws geometry and locations detection are showed.

References:

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