

1.3.26. RECENT PROGRESS IN PHASED ARRAY UT INSPECTION THROUGH COMPLEX AND WAVY SURFACES

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Phased array UT techniques are being used for inspections in nuclear and conventional power plants for more than 10 years. Applications involving simple linear arrays, using either sectorial scanning or multiple-angle raster scanning, are now commonly used and accepted. But the industry is continuously looking for inspection solutions to more challenging inspection configurations, and this requires advanced software features and phased array hardware.

This paper will present some advanced applications of phased array technology, for inspections on components with complex and wavy surfaces. It will illustrate how recently developed phased array hardware and state-of-the-art dedicated software supports these innovative phased array inspection concepts.

1D linear and 2D matrix flexible array probes can be used to improve the examination capability on components with complex surfaces. Alternatively, conformable wedges and wedges with custom contouring can be used to couple standard phased array probes onto specific regions of a wavy surface. In both cases, optimized focal law groups are required to adequately focus the acoustic energy. Various methods will be addressed to import accurate information about the component surface into the focal law calculator.

The optimized focal law groups for each probe position are calculated and stored in memory prior to the examination. During the inspection sequence, the processing power of the system allows for rapid retrieval and application of the appropriate optimized focal law group. This feature is called "position dependant focal law groups".

The presented examples will include considerations about phased array probe design, selection and generation of focal law groups, and inspection results.