

# Access Hole Cover Phased Array UT Examinations

Response to Industry Issue with Technical Innovation



*In-service access hole cover*

## NDE Challenge

Recently released inspection requirements from the BWRVIP-180: Access Hole Cover Inspection and Flaw Evaluation Guidelines place a heightened emphasis on access hole cover inspections. BWRVIP-180 was written to address long-term potential degradation due to Stress Corrosion Cracking (SCC). Due to the as-welded condition of many access hole cover configurations, traditional fixed angle contact ultrasonic testing methods can encounter significant challenges related to data quality and examination volume coverage limitations.

## AREVA's NDE Approach in Response to the Challenge

The AREVA access hole cover inspection approach consists of an innovative immersion phased array ultrasonic inspection technique coupled with a simple remote delivery system. The combination of this phased array technique and efficient delivery tool design allows for rapid data acquisition and increased examination volume coverage as compared to previous inspection methods. The tool consists of an active suction-cup to securely attach to the access hole cover surface coupled with a four-degree-of-freedom manipulator.

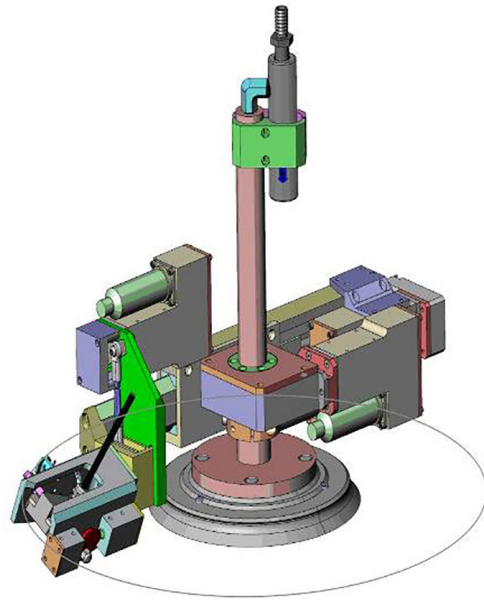
Once attached, the tool provides four independent axes of motion — theta, radial, pitch, and roll. The radial and theta motions provide compensation for tool placement inaccuracies allowing for timely installation. The pitch and roll movements are used to position the transducer for optimum inspection angle generation during the circumferential and radial scanning. By first performing a profile scan of the access hole cover, the manipulator computer maps the location of the weld toe to program the tool's auto-tracking feature. The programmed auto-tracking feature is then utilized to accurately complete all the required scanning examinations in a timely manner to meet industry requirements.

## Features and Benefits

- Innovative immersion phased array UT inspection technique — one transducer, multiple angles, multiple flaw orientations
- Adaptive scanning to maximize coverage — capable of scanning any shape
- Robust and efficient delivery system
  - Use of “touch point” technology to map out scan path
  - Auto-tracking and obstacle avoidance
  - Four degrees of motion with theta, radial, pitch, and roll
- Rapid data acquisition rate



Access hole cover inspection tool



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