

Modeling and Simulation

Inspection Design & Qualification

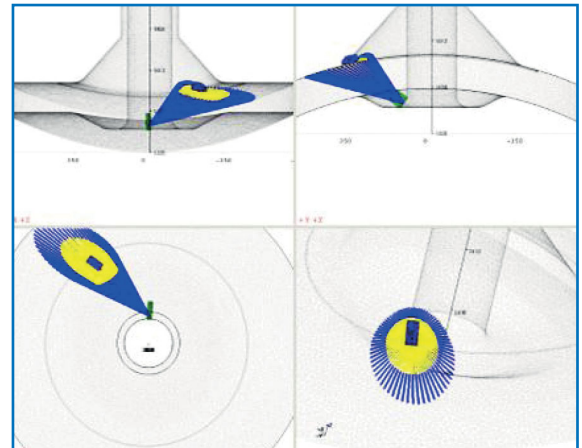
NDE modeling software has demonstrated the value of analytical design optimization in lieu of iterative prototype and test strategies. Framatome's modeling strength enables rapid development of probes and techniques to facilitate the qualification process.

Challenge

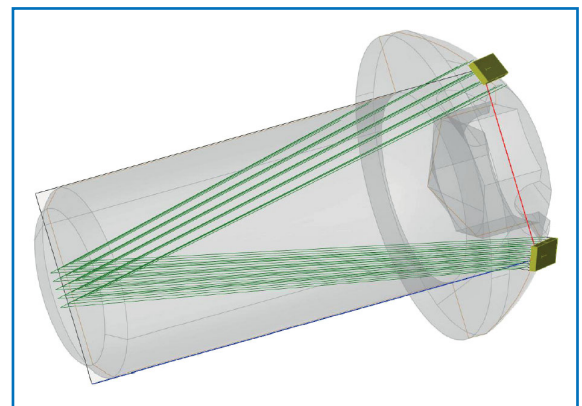
- The Ultrasonic Inspection (UT) of complex geometries usually requires the production of test mockups which have to contain artificial flaws
- High costs and long production times for the manufacturing of mockups
- Multiple Iteration cycles for the development of UT probes necessary

Solution

- Framatome offers its customers support in the simulation and modeling of their complex Inspection tasks. For this purpose we use the software CIVA (developed by CEA), which has become the market leader for the UT, ET or RT Inspections
- Furthermore, Framatome offers the self-developed software IMAV, which is a fast, user-friendly and cost-effective tool for the calculation of the scan coverage verification and qualification support



IMAV Nozzle inner-radius examination from OD

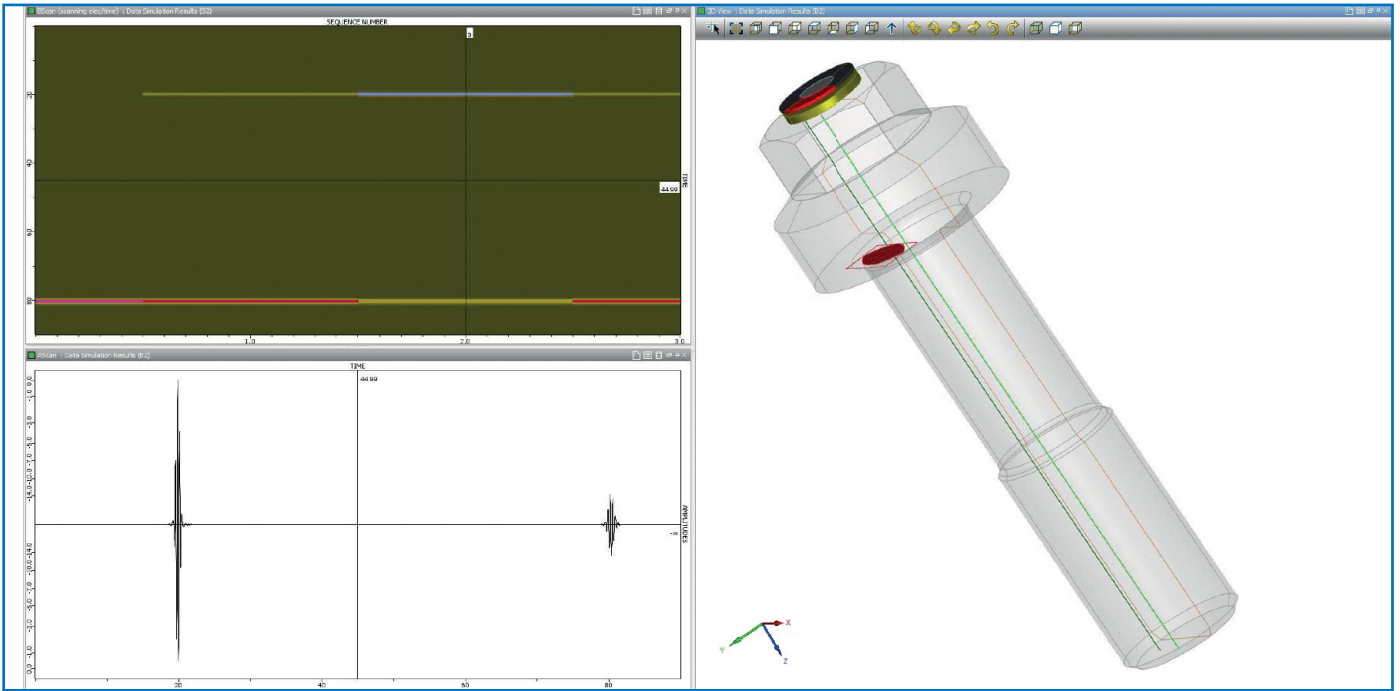


CIVA UT simulation of button-head internals bolt inspection

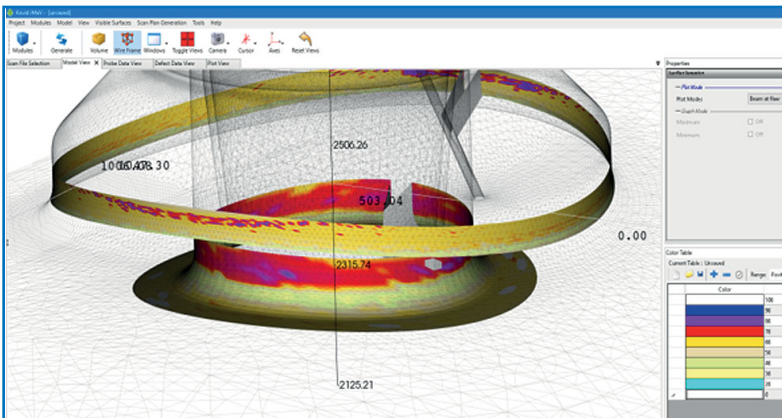
Features and Benefits

- Technique feasibility assessment without mockups or transducers
- Transducer design optimization without iterative prototype tests
- Visualization of sound path aids interpretation of observed signals
- Simulation can demonstrate critical flaw detectability throughout an inspection volume with very few reference mockups.
- NDE simulations are accepted and even expected for complex geometry technique qualification.

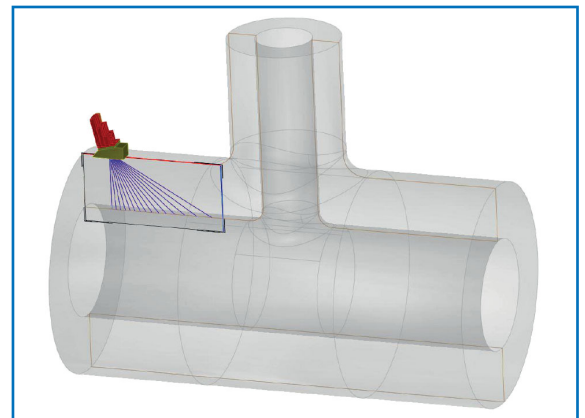
Your performance
is **our** everyday **commitment**



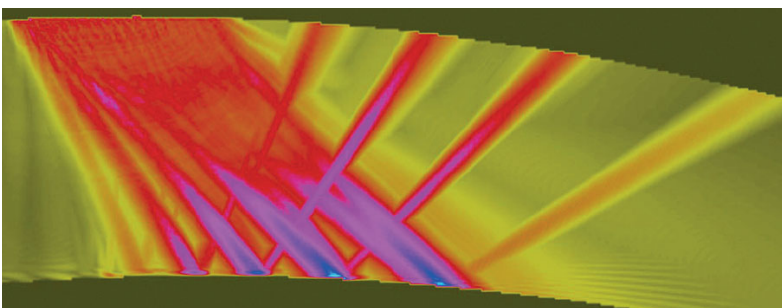
Flux leakage model for detection and characterization of sludge and oxide on support plate



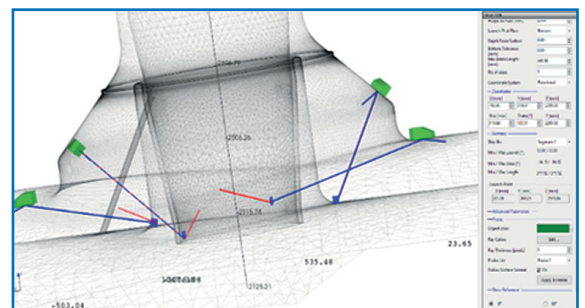
Visualisation of UT scan path coverage



UT Phased Array Beam Model



UT coverage analysis for RPV nozzle examination



Optimization of probe design for the worst case defect detection

Shorter design and development cycles (with lower costs) produce inspection qualifications that can be easily explained to regulators or defended against peer reviews.

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