CIVA N·D·E 11

Simulation Software for Non-Destructive Testing

Application Example N°8

Optimize your qualification process

Background

Inspection requirements are increasing for reasons that include civilian safety and environmental concerns, as well as the desire to reduce operating costs.

This trend in turn requires a **more rigorous qualification** process and demonstration of performance.

These new requirements result in **higher costs** associated with increased testing and analysis.

In addition, the increased **complexity of some tests** can lead to questionable results.

Benefits

Using CIVA, you can define and simulate various inspection configurations. It is then possible to:

- **Replace some laboratory experiments** with simulation results, thereby **reducing costs** significantly.
- **Analyze complex configurations** that are difficult or infeasible to test in the laboratory.
- **Determine the limitations and risks** of the inspection method to ensure good decisions regarding the operation of your facilities.

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Optimize your qualification process

Case study

Reducing the number of tests, mockups and defects to limit costs

THE PROBLEM

For many inspection setups there is significant variation in key parameters including the:

- Skew and tilt angle of the defects.
- **Surface conditions,** which may vary from perfectly smooth to an unfinished weld.
- **Curvature** of the component.
- **Composition of materials** tested.

Thus, during the qualification process, accounting for **parameter variation** requires a substantial number of studies and costly experiments. These costs can reach **several millions of dollars** for major projects.

CIVA'S CONTRIBUTION

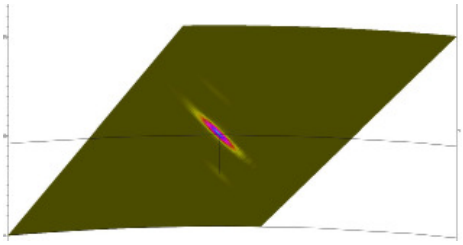
CIVA allows you to combine, parameterize and **simulate multi-variable configurations**.

In addition, CIVA allows simulation of complex configurations that are infeasible to reproduce in a laboratory, thus reducing the risk of technical failure in operation.

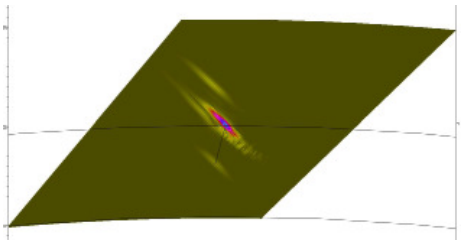
Thus, you can optimize your qualification process while at the same time reducing the number of experiments and analyses.

Influence of crack orientation

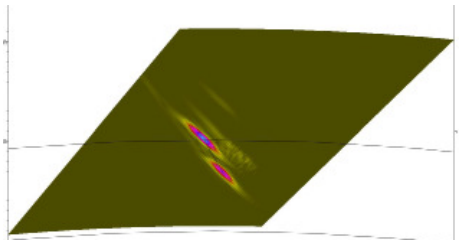
Crack perpendicular to surface - height of 4 mm



Same crack tilted -15° - height of 4 mm



Same crack tilted 30° - height of 4 mm



The defect orientation has a significant impact on the inspection result. The simulations visualize the signature of the defect as a function of orientation, greatly easing interpretation.

www.extende.com

Le Bergson, 15 avenue Emile Baudot
91300 Massy • France
contact@extende.com
Fax : +33 (0)9 72 13 42 68

PO BOX 461, Ballston Spa
NY 12020 • USA
contactus@extende.com
Fax : +1 518 602 1368