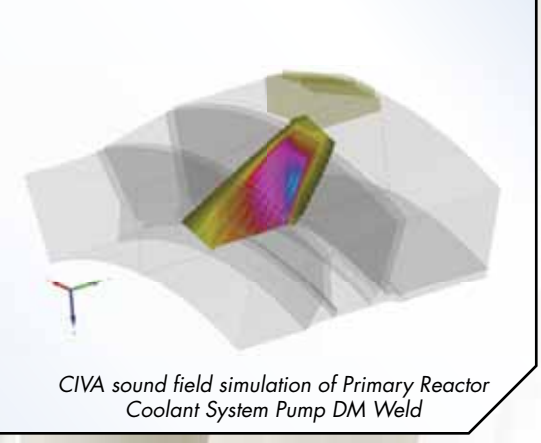


CIVA sound field simulation of Primary Reactor Coolant System Pump DM Weld

Structural Integrity Associates, Inc.®

Comprehensive Dissimilar Metal Weld Assessment

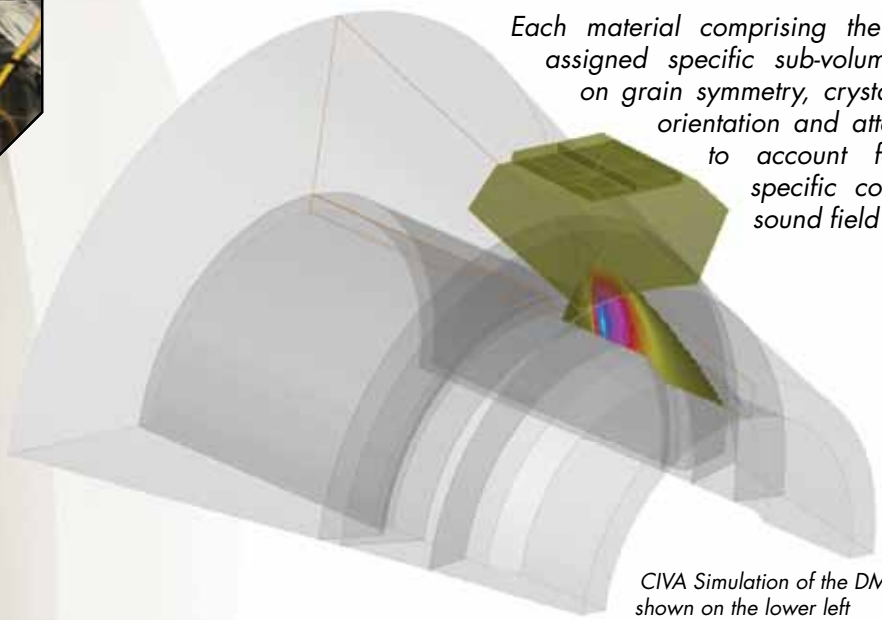
Comprehensive DM Weld Assessment:

- **Evaluation of the DW Weld Configuration**
  - Determination of whether a complex examination exists
  - PDQS / procedure applicability
  - Site specific mock-up requirements
- **CIVA Model-Based Evaluation of the Currently-Applied Ultrasonic Technique**
  - CIVA modelled sound field simulations
  - Specific emphasis on Code Case N-770-1 examination requirements
- **CIVA Model-Based Specific Technique Optimization**
  - Optimizes the robustness and placement of the sound field, enhancing flaw detection capability and increase the required examination coverage
  - Focused principally for material volumes susceptible to an active flaw mechanism
  - Recommendations provided probe and / or focal law parameters that must be modified to achieve the stated optimization goals
  - Sound field simulations using a CIVA model of the currently-used and optimized sound fields
- **CIVA model-based examination coverage**
  - This will establish the beneficial concept of basing examination coverage on modelled sound field intensity boundaries, as a technically defendable departure from the traditional (overly-conservative) central axis method

Sound Field Simulation:
Ultrasonic sound field simulation during the axial scanning of the component

Full-scale CAD models of each component under examination permits visualization of sound field simulation, as well as volumetric projection of the sound field, resulting with the ability to render precise N-770-1 examination volume coverage calculations and placement of potential flaws.

Each material comprising the component is assigned specific sub-volumes, depending on grain symmetry, crystal matrix, grain orientation and attenuation values to account for component-specific conditions during sound field simulation.



CIVA Simulation of the DM Weld examination shown on the lower left

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www.structint.com

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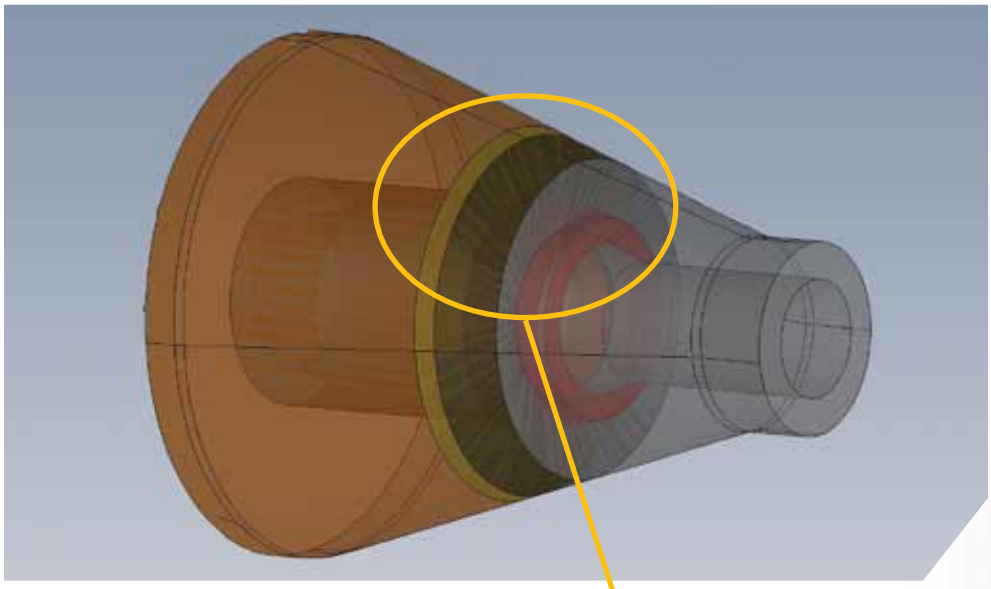
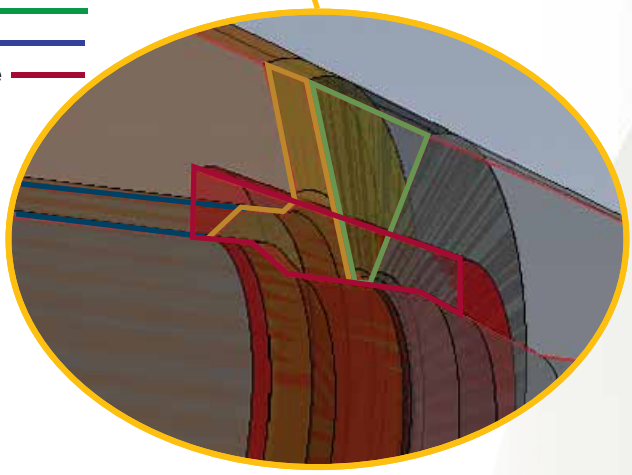
877-4SI-POWER
877-474-7693

For more information:
Email: ***info@structint.com***

Examination Coverage Determination Using SolidWorks 3-D Model of DM Weld

High-resolution surface contour data, captured using SI's 3-D laser profilometry system, are imported into SolidWorks software. Weld joint design details, visually-observed features and wall thickness data are all incorporated to generate full-scale, material-faithful volumetric models, which form the basis for precise and auditable examination coverage calculations





CUT-OUT REVEALING INTERNAL CROSS-SECTION DETAIL OF:

- **Buttering**
- **Butt Weld**
- **ID Cladding**
- **Code-required volume**

DM WELD EXAMINATIONS:

Additionally, SI offers PDI-qualified manual and encoded phased array ultrasonic examination technology delivered by experienced NDE personnel:

- **Manual Examination: Qualified for flaw detection, length and through-wall sizing**
- **Fully Automated, Encoded Examination: Qualified for flaw detection, length and through-wall sizing**

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