Neutron Imaging of Hydrogen in A354 Grade BD Steel Anchor Rods

by Lisa Thomas, P.E.
Metallurgist, Berkeley Research Company
To assess the risk of environmental hydrogen embrittlement cracking to other A354 Grade BD anchor rods do this...

Measure H concentration in the failed rods, near the fracture and in the top ends
Neutron Tomography
Gamma-Ray Activation

generate 3D maps of hydrogen concentration across the **entire** rod cross-section

**NIST scientists:**
Dr. Daniel Hussey
Dr. Thomas H. Gnaeupel-Herold
Dr. Rick L. Paul
Dr. Richard M. Lindstrom
Dr. David L. Jacobson
ALL THAT IS REQUIRED:

specimens from both ends of the S1 & S2 rods & from any other rods that are available
“Was HE cracking exclusive to corrosion of bottom threads?”

H gradient in top ends vs. H gradient in bottom ends

Informs the management strategy of other rods
In Closing...

These studies using neutron imaging to measure hydrogen content in A354 Grade BD steel fasteners of this size have not been done!

It will be invaluable, not only for the SAS Bay Bridge but for infrastructure projects around the world!

Thank You.