

Modeling of Cracked Weld where MSIP[®] was applied

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Background

- In 2016 new NDE techniques produced different results in a weld where MSIP[®] was applied
 - Weld was cracked prior to MSIP
 - NDE results confounded by fabrication defects
- Not safety significant to the plant
 - Weld overlay
- Not safety significant to industry
 - Axial flaw issue
 - Limited number of plants

NRC Actions

- Reviewed NDE
 - No independent NRC conclusion
- Reviewed Modeling
 - Licensee approach
 - NRC independent approach
 - Found differences

Modeling Differences

- Licensee currently uses approach similar to NRC plus benchmarked alternate for faster convergence
- Two areas of interest but little consequence
 - Application of “squeeze”
 - Positive displacement vs. distributed pressure loading
 - Thermal history
 - Heat from welding in many “passes” or just one

Modeling Differences

- One area of consequence
 - Hardening law
 - Isotropic vs Kinematic
- Hardening law subject of much debate
 - Will be resolved in technical community independent of this effort

Conclusion

- Issue not safety significant to plants or industry
- Most modeling differences of little practical substance
- Hardening law issue to be resolved separately
 - Efforts undergoing in the larger technical community
 - RES Technical basis development
- NRC has closed this inquiry