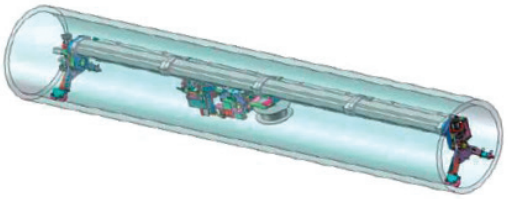
Flow Accelerated Corrosion Repair

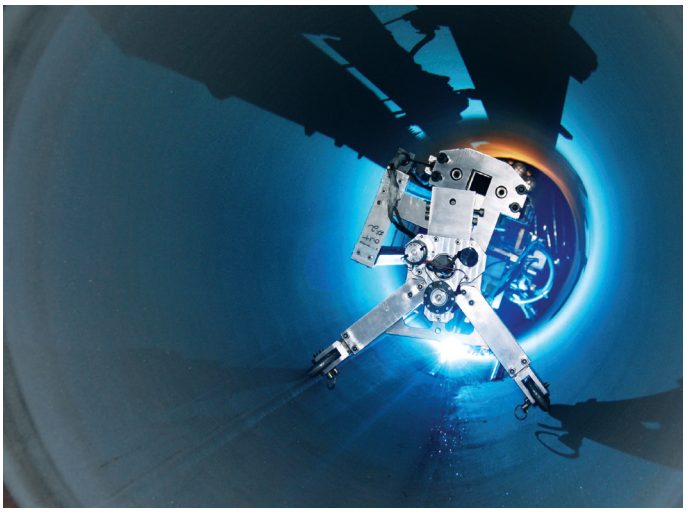
WSI FAC solution

Repairing FAC with Cross Under Piping Unifuse System (CUPUS®)

Flow Accelerated Corrosion (FAC) thinning is a serious degradation problem facing nuclear facilities worldwide. Serious pipe rupture events created by FAC have caused plant shutdowns and can be a threat to personnel safety. Most utilities have put in place FAC programs to support early detection and mitigation of potential problems. In some cases the prevalent method involving pipe replacement is cost prohibitive or will significantly impact outage durations.



In an effort to support this initiative, WSI has developed CUPUS (Cross Under Piping Unifuse System) to repair FAC in components where piping replacement is not desirable. CUPUS introduces a pulsed spray gas metal arc welding process to apply a full fusion bonded overlay of FAC resistant material with the minimum heat input to the base material. Equipment operators manage the overlay process and all critical welding parameters from a remote video console leveraging advanced microprocessor-based technology. Personnel exposure to radiological, chemical or other hazards is limited to the short duration installation, removal, and consumable maintenance for the system.



Cross Under Piping Unifuse System Cladding Process:

- Piping is media blasted to leave a white metal surface for welding
- Cladding is applied using a pulsed spray arc GMAW process
- Cladding thickness is 0.08" – 0.19"
- Each CUPUS system set-up takes approximately one shift
- Cladding is applied on both horizontal and vertical pipe runs

CUPUS Cladding Process Advantages:

- Lightweight
- Fully remote operation
- Ease of movement
- 21"I.D. – 60"I.D.
- Speed of deposition
- Final blending of finished product is completed including manual tie-ins
- Application of superior alloys eliminates future thinning of the component

CUPUS®

The CUPUS overlay process provides full coverage for 360° of piping system inside diameter for sizes as small as 21" in diameter. The controlled heat input of the welding process assures minimal dilution of the weld chemistry as well as heat related distortion. The system is adaptable to overlay larger diameters including components such as heat exchanger shells and pressure vessels. The system can be configured to weld horizontally, vertically, or on angled components. The CUPUS solution also features the application of alloys that are significantly upgraded from the original base material thus eliminating future thinning of the component.

WSI has completed multiple projects with excellent results utilizing the CUPUS technology. A recent example involved the successful CUPUS inside diameter overlay of several sections of a header, wye, and penetration piping in-situ. Working in tandem with the utility on their FAC program, deploying CUPUS enabled the utility to avoid fabrication, obstruction removal (for penetration piping), engineering expense in the way of modifications, and a greater than two year lead time.

Benefits of WSI

WSI is the nuclear industry expert in specialty welding solutions and Weld Overlay mitigation of dissimilar metal welds. With nearly 50 years nuclear industry experience, WSI provides specialty Engineered Solutions and Repair Solutions services to our U.S. and international customers either on a planned or emergent basis.

- Field resource pool of over 700 nuclear qualified, highly trained, pipefitters and boilermakers to meet demanding outage requirements. WSI uses global labor resources with specialty skills and automatic welding experience to augment local craft resources.
- Tooling inventory of 250+ automatic welding and mechanical systems capable of meeting nearly any challenging repair or access configuration, including remote video capabilities. WSI designs, manufactures, and maintains its own equipment and can respond to equipment modification demands on an emergent basis.
- WSI Nuclear QA Program meets the requirements of 10CFR50, Appendix B and NQA-1, and is a NUPIC-audited nuclear supplier.
- An ASME Welding Program with over 1000 qualified welding procedures to meet almost any material or configuration challenge. WSI can generate new weld procedures on a planned or emergent basis.
- WSI also has extensive expertise in areas of metallurgy, welding processes, repair and tooling design – with a long resume of custom tooling and first-of-a-kind industry repair successes.
- WSI takes pride in being the industry leader in responsiveness for projects that are "Critical to Safety, Critical to Schedule, and Critical to Quality."

WSI℠

An Avail Infrastructure Solutions Company

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