Augmented Repair via Additive Manufacturing

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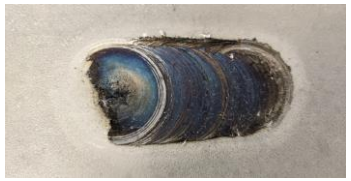
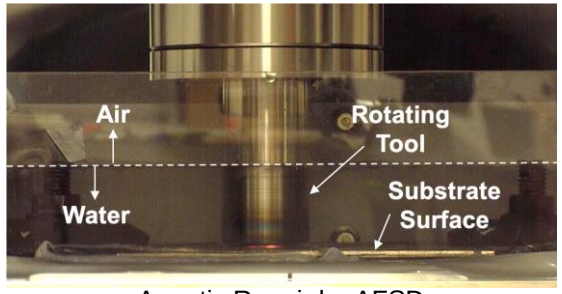
Additive Repair enabled by Advanced Manufacturing



Underwater Metal 3D Printing on Stainless Steel



Aquatic Repair by AFSD

Combining a novel additive manufacturing technology with modern advances in robotics to enable superior repair in less than half the time as current methods

1. The Problem

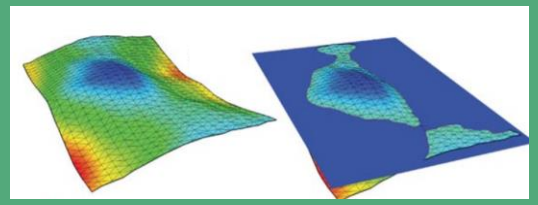
Erosion damage and fatigue cracking of metallic turbine components causes *cumulative efficiency loss*, and hydro-electric plant *downtime for maintenance and repair,* driving up the **levelized cost** of hydro-electric energy (LCOE)

Photo of a blade damaged by cavitation erosion

Image courtesy of Victoria Propeller Ltd.

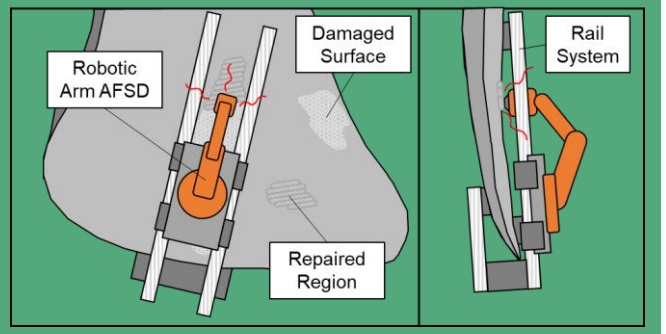
2. Our Solution

- Underwater inspection and repair using AFSD and phased array ultrasound (PAUT)
- Unique solid-state deposition with low residual stress and distortion
- Not limited to traditional 'weldable' materials, and can repair fatigue cracks
- Estimated 10% reduction in LCOE



PAUT surface mapping

Semi-Autonomous Underwater Repair via AFSD



Team Fusion Free Fabrication

- Innovative early- and mid-career professionals
- Technical Expertise in Advanced Manufacturing
- Diverse work experience including *aerospace*, *semiconductor*, and *additive manufacturing*, Army Research Labs, and Oak Ridge National Lab

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