

Challenge

Issue

Severe erosion had washed out previous lining after <6 months. Erosive flow damage was evident on exposed metal surfaces.

Goals

Install a protective coating with erosion resistance and high tensile adhesion capable of withstanding erosive flow and continuous immersion.

Root Cause

As water transitions from laminar to radial flow mechanical/erosion damage occurs at leading edges of stay vanes and outer race of scroll case.



Scroll case and stay vanes after grit blasting.

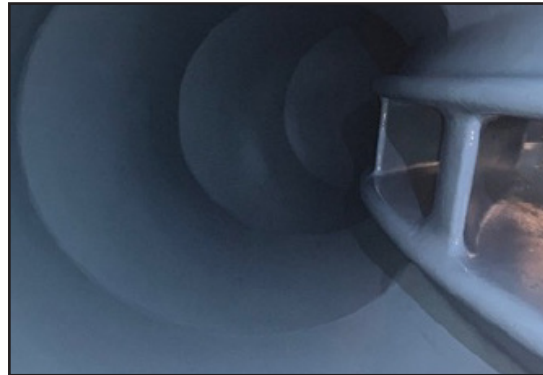
Solution

Preparation

Grit blast to remove previous coating and create 75 µm (3+ mil) angular profile with a near white surface cleanliness.

Application

ARC 858 used as a faring compound to fill in pitted and eroded sections prior to top coating with **ARC SD4i**. The **ARC SD4i** coating was applied to prepared metal and metal repaired with **ARC 858** while **ARC 858** was within overcoat window. A total 1.1 mm – 1.5 mm (45 – 60 mils) total DFT were applied in alternating colors for visual wear indications.



Scroll case and stay vanes coated with **ARC SD4i**.

Results

Client Reported

After 12 months in service, inspection revealed <.05% of coated surface area had seen coating damage, primarily tied to galvanic coupling at scroll case (CS) to wicket gate transition (SS).

This was compared to nearly 100% coating loss from previously applied system.

Client elected to coat second unit in a similar fashion in spring of 2022.



Final coat of **ARC SD4i** on stay vanes.