Repair and Protection of Turbine Stay Vanes

ID: 10174

Industry:	*Power*	Customer Location:	*Rangipo*
Application:	*CEP-Centrifugal Pumps*	Application Date:	*November 2025*
Substrate:	*Carbon steel*		
Products:	*Belzona 1311 (Ceramic R-Metal),Belzona 1321 (Ceramic S-Metal)*		

Problem

The original coating on the stay vanes of this turbine had begun to wear through and mechanical damage to the leading edges was evident.

The stay vanes help guide water towards the runner section and rotor blades, reducing vortices at the inlet flow caused by radial flow. Any reduction in flow efficiency has a negative effect upon power generation, efficiency and profitability and must be rectified.



Damage to the previous coating and substrate caused by grit and rocks in the water used to turn the turbine



Blast cleaning to remove any rust and loosely adherent coating



The first coat of Belzona 1321 grey (detail)



The completed second coat of Belzona 1321 blue

Application Situation

The turbine is driven with river water which contains abrasive contaminants and can at times contain larger rocks which continually wear away and cause mechanical damage to the equipment. If left unchecked this damage would ultimately result in a catastrophic failure of the power station and an unacceptable loss of power. Belzona 1311 (Ceramic R-Metal) was used to rebuild the leading edges of the stay vanes and Belzona 1321 (Ceramic S-Metal) was utilized as a protective barrier against abrasion with the added benefit of enhancing fluid flow, increasing efficiency and reducing running / maintenance costs.

Application Method

The stay vanes were grit blasted with an angular abrasive in-line with the Belzona specification and damage to the leading edges was repaired with Belzona 1311 Ceramic R metal. Once stable the Belzona 1311 was sanded and the whole stay vane assembly coated in two coats of Belzona 1321 Ceramic S metal to an average wet film thickness of 375 microns per coat.

ISO 9001:2015
FS 695214
ISO 14001:2015
EMS 695213

Belzona products are manufactured under an ISO 9000 Registered Quality Management System.

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Belzona Facts

The previous Belzona coating outperformed all alternative solutions previously used by the client, providing a significantly longer service life. Consequently, from the asset owner's perspective, there is a strong preference to continue using Belzona due to its proven performance and long-term reliability.

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