

Consequence and active use of free gas in hydropower

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6. april 2016

Background

- Industrial PhD project with Flow Design Bureau and The Research Council of Norway
- Started 1 March 2015
- Main supervisor Torbjørn Nielsen

Aim of the PhD project

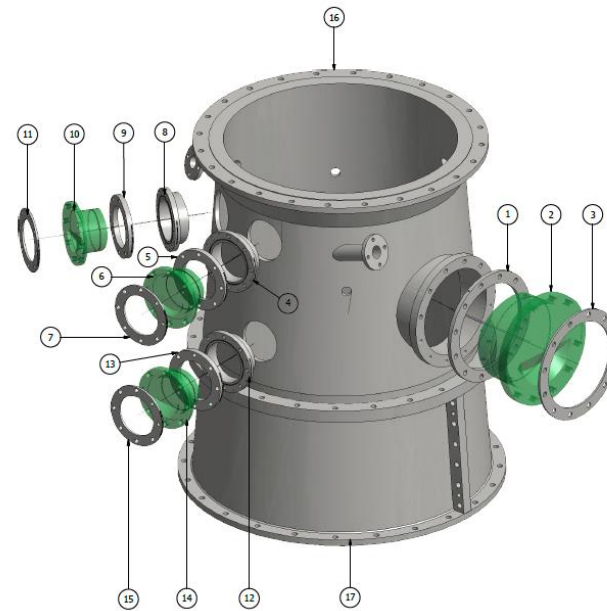
- Investigate effects of cavitation
- Look at different methods of air injection for dampening of pressure pulsations

Svorka Visual

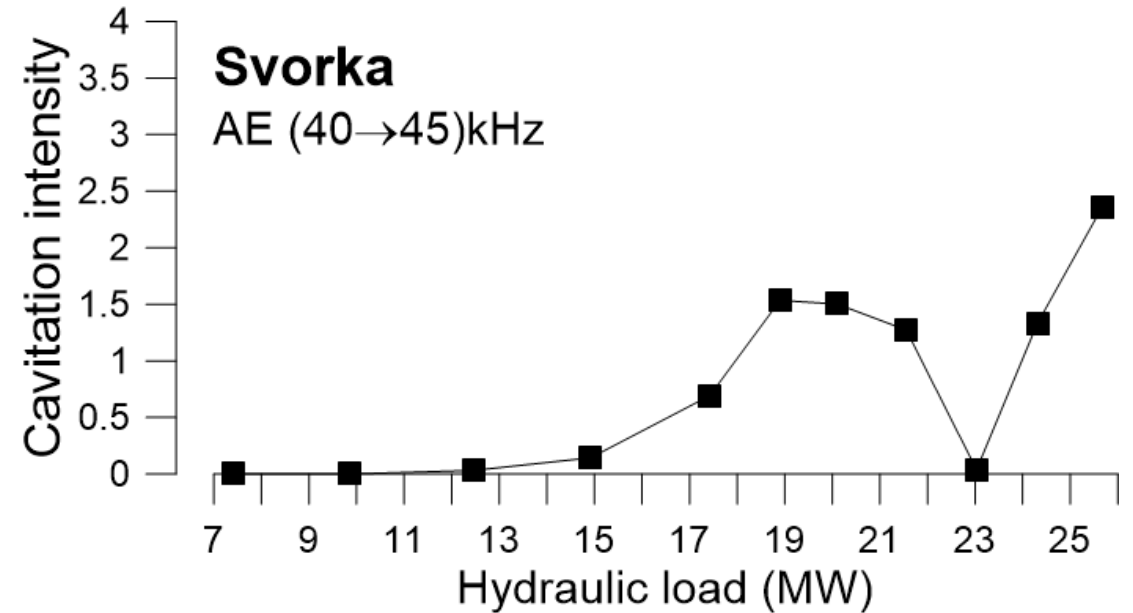
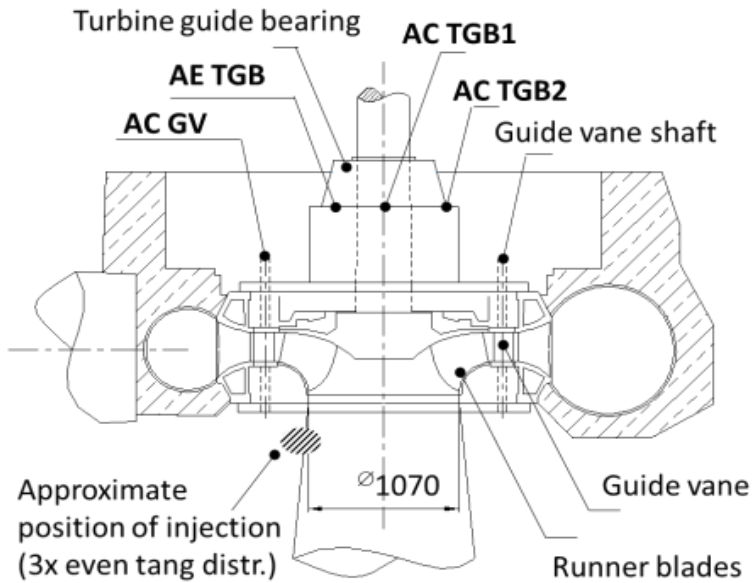
Svorka power plant

- Located in Surnadal, operated by Statkraft
- 25 MW
- 250 m head

- Plexiglass windows installed
- Water injection system and original air suction system

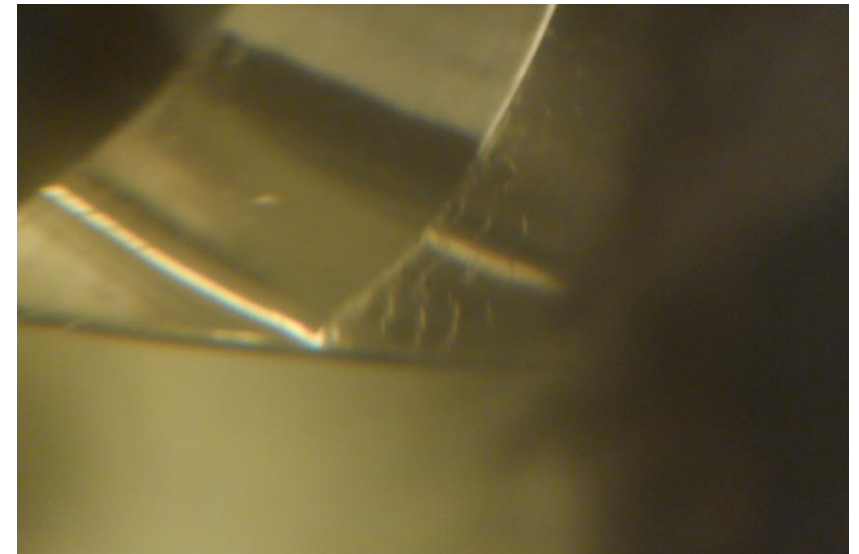
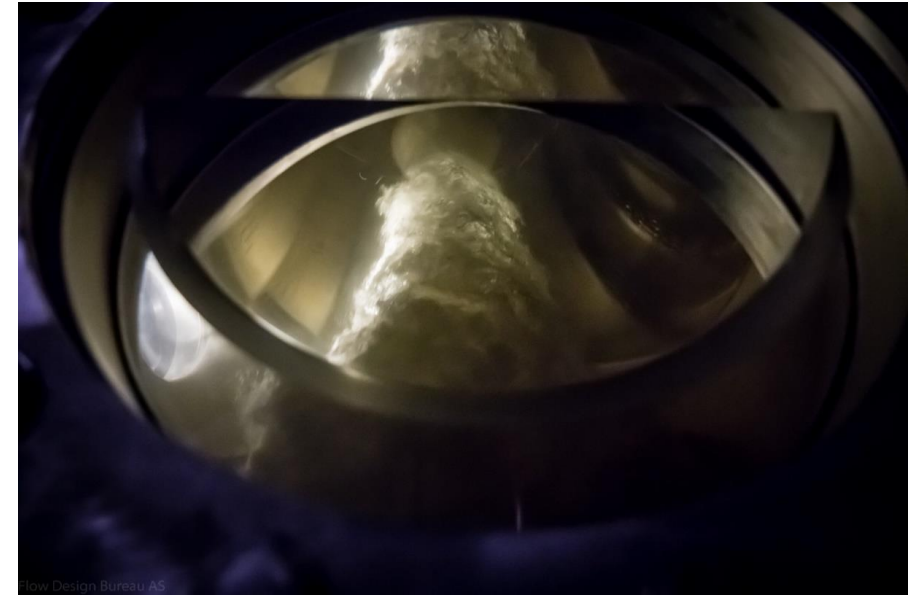
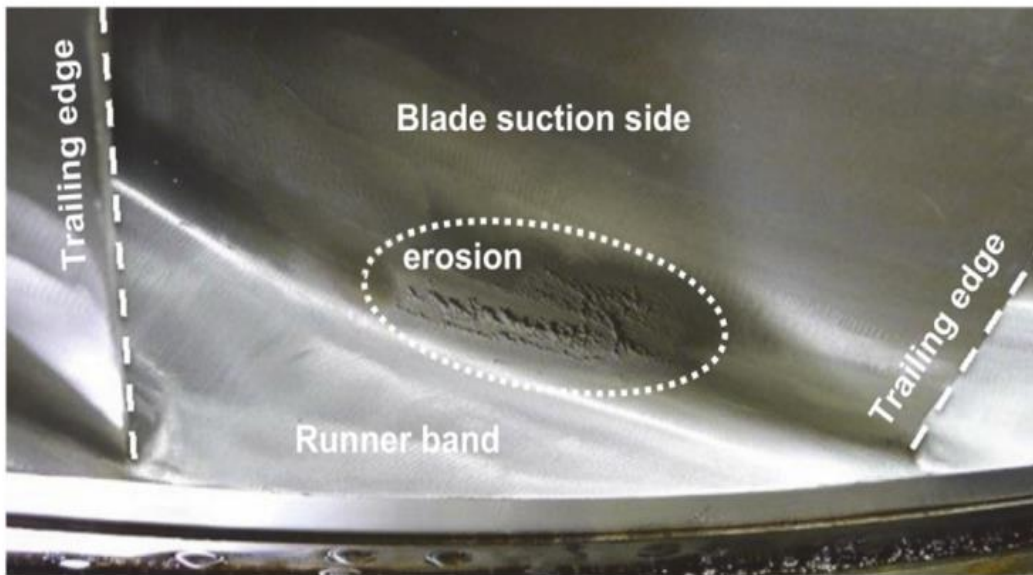


Measurement setup



Demodulated acoustic emission at 200 Hz

- Correlate visual observations of cavitation and cavitation intensity measurements
- Measurements with cavitation intensity measurements and high speed camera carried out in March 2016



SAFL Experiment

- Effect of gas content on dynamic response of cavitation tunnel
- Cavitating hydrofoil as an excitation frequency
- Measure pressure response at several locations in the tunnel

