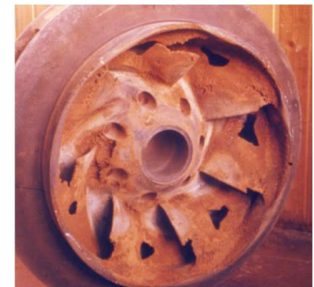


Cavitation Erosion Prediction



When it comes to the design of centrifugal pumps, cavitation is the most important design factor to cope with. On the one hand pumps must be designed to have a certain amount of cavitation to be market competitive and on the other hand too much cavitation occurring in the pump will negatively influence the pump performance, increase noise and vibration levels and may cause cavitation erosion.

If the hydrodynamic cavitation intensity, which describes totality of the implosion energy of all bubbles, exceeds the cavitation resistance, the material will be damaged by cavitation erosion if it is exposed sufficiently long to the attack.



With the current commercially numerical CFD tools it very well possible to predict the effect of cavitation on the pump performance. However, to predict the erosion rates on the pump impeller surfaces currently in the pumping industry still 1D empirical models are used in which the length of the cavitation sheet is one of the major parameters.

An assignment at Rodelta will be focused on one or more aspects:

- 1) Use currently available literature on cavitation erosion (1) and (2) investigate how current CFD tools can be used to predict the best possible cavitation erosion rates.
- 2) Establish a robust CFD strategy which requires some degree of automation.

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