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## Failure analysis of slurry pump impeller: Wrong selection of material

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Impeller is a common rotating unit which is used inside of a pump. In industry it was used for different location for transferring of fluid. Present study described failure case of impeller which used in quenching pump of coke plant battery. The pump is used to transfer slurry water which used to quench the coke in Coke Plant. The impeller was failed prematurely within one year of its service. The blades of impeller were severely eroded and thickness was gradually decreased, severe holes were also observed on the blades of impeller. The investigation consisted of visual inspection, chemical analysis, characterization of microstructures using optical microscopes and hardness test. The quench pump impeller was made off cast iron with flaky graphites in pearlite matrix. Corresponding water analysis was also carried out to detail study of failure case. The present case study suggests that the impeller failed in wear due to use of low hardness material. Analysis revealed failure occurred due to improper selection of material for the present application. Suitable material with higher hardness cast material was recommended for the application to improve the wear resistance of the impeller.

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