

## Significance of High Specific Speed in Circulating Water Pump, Which Can Cause Cavitation, Noise and Vibration

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**Abstract :** Excessive vibration means increased wear, increased repair efforts, bad product selection & quality and high energy consumption. This may be sometimes experienced by cavitation or suction/discharge re-circulation which could occur only when net positive suction head available NPSHA drops below the net positive suction head required NPSHR. Cavitation can cause axial surging if it is excessive, will damage mechanical seals, bearings, possibly other pump components frequently and shorten the life of the impeller. Efforts have been made to explain Suction Energy (SE), Specific Speed (Ns), Suction Specific Speed (Nss), NPSHA, NPSHR & their significance, possible reasons of cavitation /internal re-circulation, its diagnostics and remedial measures to arrest and prevent cavitation in this paper. A case study is presented by the author highlighting that the root cause of unwanted noise and vibration is due to cavitation, caused by high specific speeds or inadequate net- positive suction head available which results in damages to material surfaces of impeller & suction bells and degradation of machine performance, its capacity and efficiency too. The author strongly recommends revisiting the technical specifications of CW pumps to provide sufficient NPSH margin ratios  $> 1.5$ , for future projects and Nss be limited to 8500 -9000 for cavitation free operation.

**Keywords :** best efficiency point (BEP), net positive suction head NPSHA, NPSHR, specific speed NS, suction specific speed NSS

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