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## Noise Prediction for a Pumping Loop using the Noise Synthesis Technology Approach

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A collective project involving the french manufacturers of industrial pumps and valves is dedicated to the noise prediction in pumping plants. This paper presents a methodology based on virtual acoustic prototyping, and specifically on the noise synthesis technology (NST). Prediction of radiated noise in particular locations, such as operator stations or contractual specifications, allows to control from the conception stage if the industrial plant will meet the prescribed noise criteria (regulations or user specifications). In addition, related noise control recommendations can be achieved by comparison of data obtained from the individual response of the components and their interaction. This methodology does not work as an absolute predictive process, and thus requires experimental validation. Components are taken into account by establishing their detailed vibroacoustic characteristics (technical data or measurements); in the present work on a simplified pumping loop, selected components are a centrifugal pumping unit, an open pipe circuit and several type of valves. Vibroacoustic and hydroacoustic measurements have to be adjusted according to the NST requirements. Comparison of the NST results with experimental data show a wide validity domain, covering the 100-10k Hz third-octave range.