Fachartikel

The Use of Computers for Heterogeneous Slurry Pumping Analysis

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The pipeline transportation of solids by heterogeneous sus pension in a carrying fluid is a complex phenomenon. The well researched documented and reliable hydraulic theory applicable to the flow of a truly homogeneous fluid with measurable properties such as water is not applicable to slurry flow analysis. The design engineer is now faced with a multi-phase flow situation having indeterminate and variable properties and, unless a reliable mathematical method of analysis can be used, expensive pilot plant studies are necessary before a system can be engineered.

The mathematical solutions to slurry flow determination are further complicated when the flow is broken into two components for analysis, namely a pseudo homogeneous amended carrying fluid consisting of the actual carrying fluid together with the finer particles, with the larger particles being carried in this amended fluid in heterogeneous suspension.

The use of a computer to solve the resulting complex equations by iterative means and the subsequent automatic plot ting of results is described in this paper.

The conclusion reached in the paper is that meaningful results, utilising extensions of existing slurry pumping theory can be obtained by using

computerised iterative analysis. Thereby the analyses of specific or ranges of slurry pumping duties become a relatively simple affair.