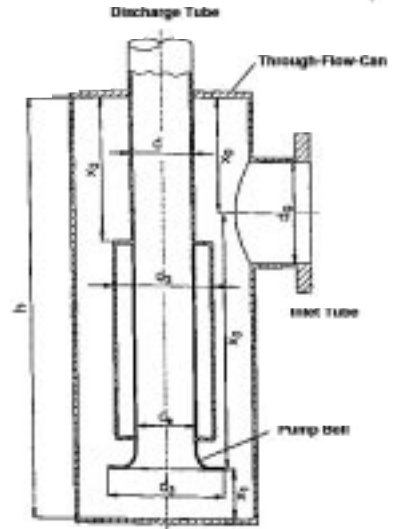


Features Demonstrated

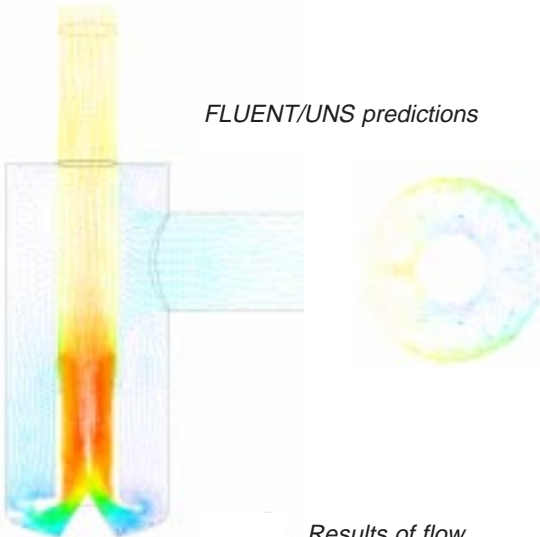
- ◆ Incompressible, turbulent flow (standard k-e)
- ◆ Validation of head loss computation

Minimizing the overall costs incurred with the use of canned-type pumps in hydraulic systems requires these pumps to meet high performance criteria with minimal manufacturing and construction expenditures. FLUENT/UNS analysis of canned-type pumps compare well with experimental flow field measurements and capture the influence of geometrical design parameters on the resulting flow behavior within the through-flow-can.



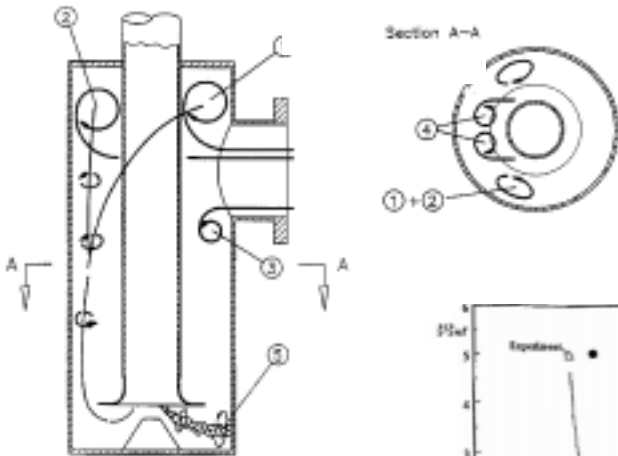
Canned-type axial tubular casing pump

FLUENT/UNS predictions



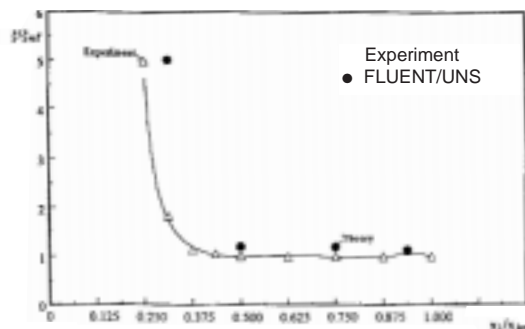
Velocity vector fields for the symmetry slice and cross section A-A demonstrate strong qualitative agreement with the location of steady vortex structures seen in experimental flow visualization. The vortices (1),(2) and (3) observed in the middle section as well as combined vortex (1) + (2) and vortices shed from the pump wall (4) are readily observed. Moreover, the FLUENT/UNS results expose details of the secondary flow field which could not be captured by the experimental flow visualization technique .

Results of flow visualization tests



Losses occurring in the through-flow-can reduce the overall pump efficiency. Normalized total pressure loss coefficients predicted by FLUENT/UNS for various distances from pump bell to the through-flow-can floor compare favorably with experimentally measured loss coefficients for the same configuration.

FLUENT/UNS' ability to capture complex flow details without costly physical modeling provides designers with a valuable tool for more cost effective optimization of pump design.



Courtesy of KSB-AG Frankenthal and University of Kaiserslautern

Comparison of experimentally and numerically determined loss coefficients