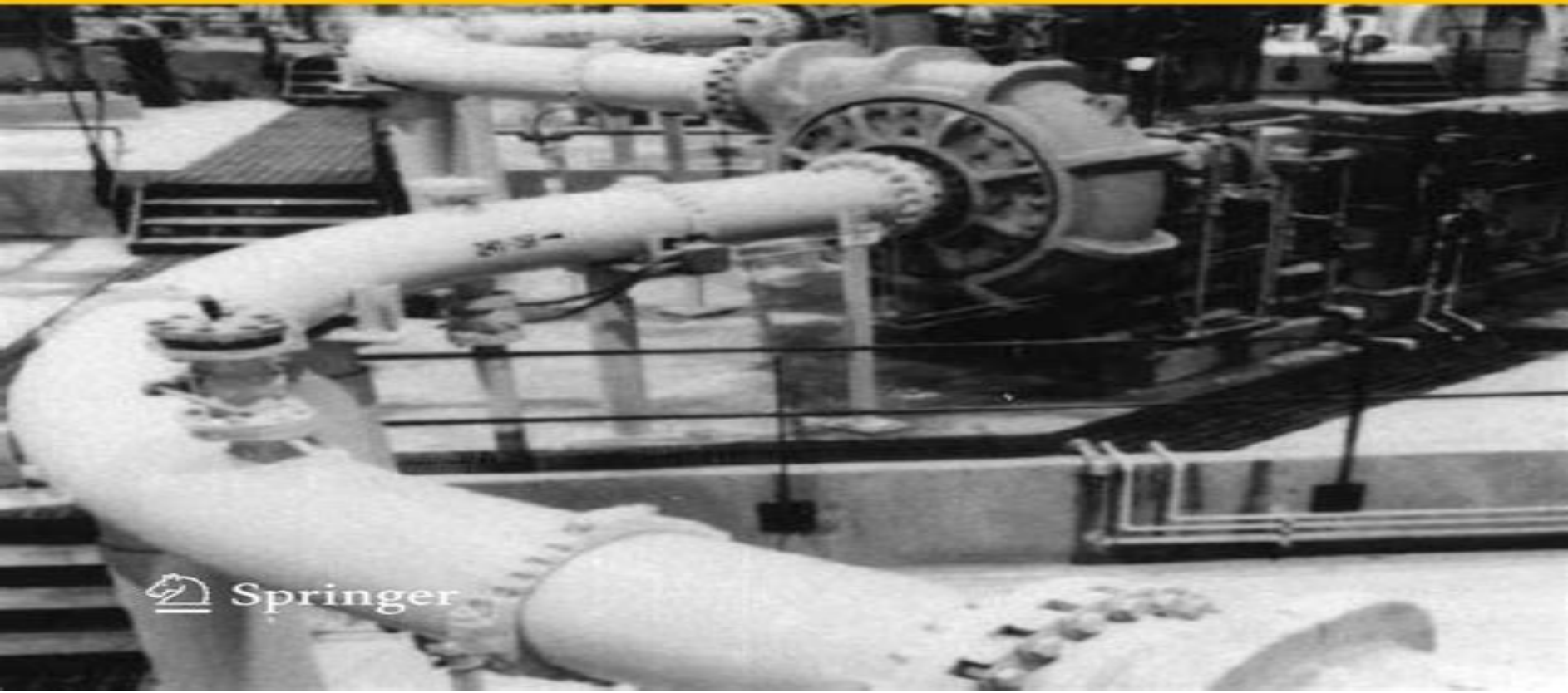


K.C. Wilson, G. R. Addie,
A. Sellgren and R. Clift

SLURRY TRANSPORT USING CENTRIFUGAL PUMPS

Third Edition



Slurry Transport Using Centrifugal Pumps

Baha Abulnaga



Slurry Transport Using Centrifugal Pumps:

Slurry Transport Using Centrifugal Pumps K. C. Wilson, G. R. Addie, A. Sellgren, R. Clift, 2008-03-28 1 1 Applications of Slurry Transport Vast tonnages are pumped every year in the form of solid liquid mixtures known as slurries The application which involves the largest quantities is the dredging industry continually maintaining navigation in harbours and rivers altering coastlines and winning material for landfill and construction purposes As a single dredge may be required to maintain a throughput of 7000 tonnes of slurry per hour or more very large centrifugal pumps are used Figures 1 1 and 1 2 show respectively an exterior view of this type of pump and a view of a large dredge pump impeller Addie Helmley 1989 The manufacture of fertiliser is another process involving massive slur transport operations Li Florida phosphate matrix is recovered by huge draglines in open pit mining operations It is then slurried and pumped to the wash plants through pipelines with a typical length of about 10 kilometres Each year some 34 million tonnes of matrix are transported in this manner This industry employs centrifugal pumps that are generally smaller than those used in large dredges but impeller diameters up to 1 4 m are common and drive capacity is often in excess of 1000 kW The transport distance is typically longer than for dredging applications and Chapter 1 Figure LI Testing a dredge pump at the GIW Hydraulic Laboratory Figure 1 2 Impeller for large dredge pump 1 Introduction 3 hence a series of pumping stations is often used Figure 1 3 shows a boost pump installation in a phosphate pipeline

Slurry Transport Using Centrifugal Pumps Robert Visintainer, Václav Matoušek, Lionel Pullum, Anders Sellgren, 2023-04-03 This book is based on the industry leading short course of the same name hosted by the GIW Industries Hydraulic Laboratory and founded by Dr Roland Clift and Graeme Addie who together with Dr Ken Wilson continued its development and authored the first edition of this textbook This fourth edition has been extensively updated by the international team of engineers and authors who inherited this legacy and continue its development to the present day Focusing on the hydraulic design of slurry pipelines the pumps that power them and the interactions between pumps and systems it retains the classroom tested balance of theoretical development and practical engineering which have made it a slurry transport classic The topics covered are important to slurry system engineers for the optimization of new designs as well as the operators of existing systems who may need to calculate and plan for changing conditions from day to day Updates to the fourth edition include Careful formulation of the theoretical concepts providing greater clarity of slurry flow dynamics including a new chapter on the principles and characterization of slurry flows Expansion of the 4 Component Models for settling slurry pipeline flow and pump solids effect based on an extensive series of full sized tests An expanded treatment of complex slurries including a broader discussion of non Newtonian fluids and their interaction with coarse particles A new chapter on test methods presenting an overview of slurry system instrumentation modern techniques for characterizing slurry rheology and practical advice for planning and executing a slurry test An overview of advances in the computational modeling of slurries including an in depth parametric study of slurry pump wear

and operating cost The authors highlight methods for achieving energy efficiency which are crucial to the effective use of scarce resources given the foundational role of slurry transport systems in the energy intensive industries of mining and dredging Key concepts are supported with case studies and worked examples Slurry Transport Using Centrifugal Pumps fourth edition is both methodical and in depth It is ideal as a teaching tool for classroom or self directed learning domains and valuable as a design guide for engineer practitioners at all experience levels

Slurry Transport Using Centrifugal Pumps K. C. Wilson, G. R. Addie, A. Sellgren, R. Clift, 2008-11-01 1 1 Applications of Slurry Transport Vast tonnages are pumped every year in the form of solid liquid mixtures known as slurries The application which involves the largest quantities is the dredging industry continually maintaining navigation in harbours and rivers altering coastlines and winning material for landfill and construction purposes As a single dredge may be required to maintain a throughput of 7000 tonnes of slurry per hour or more very large centrifugal pumps are used Figures 1 1 and 1 2 show respectively an exterior view of this type of pump and a view of a large dredge pump impeller Addie Helmley 1989 The manufacture of fertiliser is another process involving massive slur transport operations Li Florida phosphate matrix is recovered by huge draglines in open pit mining operations It is then slurried and pumped to the wash plants through pipelines with a typical length of about 10 kilometres Each year some 34 million tonnes of matrix are transported in this manner This industry employs centrifugal pumps that are generally smaller than those used in large dredges but impeller diameters up to 1 4 m are common and drive capacity is often in excess of 1000 kW The transport distance is typically longer than for dredging applications and Chapter 1 Figure LI Testing a dredge pump at the GIW Hydraulic Laboratory Figure 1 2 Impeller for large dredge pump 1 Introduction 3 hence a series of pumping stations is often used Figure 1 3 shows a boost pump installation in a phosphate pipeline *FEDSM2007* American Society of Mechanical Engineers. Fluids Engineering Division, 2007 A printed collection of 234 full length peer reviewed technical papers It includes topics such as 10th International Symposium on Gas Liquid Two Phase Flows 10th International Symposium on Liquid Solid Flows 11th International Symposium on Gas Particle Flows and 12th Symposium on Algorithmic Developments in CFD

Chemical Engineering Progress, 1999 **Proceedings of the ASME Fluids Engineering Division Summer Meeting** American Society of Mechanical Engineers. Fluids Engineering Division. Summer Meeting, 1996

Pump Handbook Igor J. Karassik, Joseph P. Messina, Paul Cooper, Charles C. Heald, 2007-12-18 Rely on the 1 Guide to Pump Design and Application Now Updated with the Latest Technological Breakthroughs Long established as the leading guide to pump design and application the Pump Handbook has been fully revised and updated with the latest developments in pump technology Packed with 1 150 detailed illustrations and written by a team of over 100 internationally renowned pump experts this vital tool shows you how to select purchase install operate maintain and troubleshoot cutting edge pumps for all types of uses The Fourth Edition of the Pump Handbook features State of the art guidance on every aspect of pump theory design application and technology Over 100 internationally renowned contributors SI units used throughout

the book New sections on centrifugal pump mechanical performance flow analysis bearings adjustable speed drives and application to cryogenic LNG services completely revised sections on pump theory mechanical seals intakes and suction piping gears and waterhammer application to pulp and paper mills Inside This Updated Guide to Pump Technology Classification and Selection of Pumps Centrifugal Pumps Displacement Pumps Solids Pumping Pump Sealing Pump Bearings Jet Pumps Materials of Construction Pump Drivers and Power Transmission Pump Noise Pump Systems Pump Services Intakes and Suction Piping Selecting and Purchasing Pumps Installation Operation and Maintenance Pump Testing Technical Data **Paste** ,2007 *Fluids Engineering Conference - Proceedings of the International Joint U. S.-European ASME Conference (2002: Montrealg, Canada)* Dieter Mewes,2002 Annotation This is Volume 2 in two parts of the proceedings of a July 2002 conference on a wide range of topics related to fluids engineering analysis numerical methods experiments in single phase and multiphase flows and applications In Part A about 70 contributions discuss flows in manufacturing processes experimental and numerical flow visualization and laser anemometry erosion processes fluid structure interaction and flow induced noise in industrial applications numerical methods for multiphase flows numerical developments in CFD and non invasive measurement in multiphase flows Part B approximately 60 contributions covers advances in numerical modeling of aerodynamics and hydrodynamics in turbomachinery fluid flow in micro systems measurements analysis and applications the measurement and modeling of large scale turbulent structures and fluids engineering There is no subject index Annotation c Book News Inc Portland OR booknews com Slurry Systems Handbook, Second Edition Baha Abulnaga,2021-03-05 A complete guide to slurries and slurry systems fully updated for the latest advances This thoroughly revised guide contains start to finish coverage of slurry systems from fundamentals and fluid mechanics to pump design and materials selection Written by a recognized expert in the field Slurry Systems Handbook Second Edition clearly explains the components dynamics and design of slurry systems for many applications including mineral processing nuclear waste processing extra heavy oil upgrade mineral concentrate transport tailings systems and metal melting You will get real world examples solved problems and current codes as well as guidelines for conducting feasibility studies and hands on operating procedures Coverage includes General concepts of slurry flows Multi species and stratified heterogeneous flows Non Newtonian slurry flows Open channel and cascade slurry flows Slurry Hammer and Transients in closed and open channels Centrifugal and positive displacement slurry pumps Long distance slurry pipelines by commodity such as coal copper phosphate or gold Oil sand extraction Slurry reactors hydrocracking and heat transfer Hydrocarbon and hydrate based slurry pipelines Semi solid metals casting Tailings systems paste backfilling Slurry flows for nuclear waste processing De silting hydroelectric reservoirs

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