

Registration

BHR Group
EXPERTS IN FLUID ENGINEERING

2-day Training Course on

SLURRY HANDLING

to be held at
Neotechnology Consultants Ltd
#430, 910 – 7th Avenue S.W.
Calgary, Alberta, Canada

June 7 and 8, 2010

BHR Group Ltd
The Fluid Engineering Centre
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Nigel I Heywood
and
Neil J Alderman

Lecturers

Dr Nigel I Heywood is a chartered chemical engineer and Fellow of the Institution of Chemical Engineers. He graduated with in chemical engineering from Imperial College, London University, and, after having obtained a MSc in Advanced Chemical Engineering, he researched the effects of air injection into slurry flow in pipes at the University of Wales. He continued research into multiphase pipeflow at the University of Toronto, Canada, before returning to England to work at Warren Spring Laboratory, and joined AEA Technology in 1994 and then Aspen Technology in 2002. He now provides consultancy, research and training courses at BHR Group, Cranfield, UK. He lectures on rheology, slurry handling, bulk solids handling, mixing and on-line instrumentation, has written over 100 articles and reports, and a book entitled "Slurry Handling: Design of Solid-Liquid Systems". He obtained an Executive MBA and DIC from Imperial College in 1996.

Dr Neil J Alderman obtained his PhD in Chemical Engineering in 1986 from the University of Bath. In 1986 went to work for Schlumberger Cambridge Research Ltd. He joined Warren Spring Laboratory in 1991 to work on applied rheology. He now works at BHR Group, Cranfield, UK, providing pilot-plant and lab-based consultancy and research services. He lectures on rheology, slurry handling, bulk solids handling, mixing and on-line instrumentation and has published over 100 papers and reports.

COURSE OUTLINE

MONDAY, 7 JUNE 2010

- **Laboratory Measurement of Slurry Flow Properties**
Overview of various rheological techniques used for measurement & characterisation of suspensions and pastes. Includes a detailed worked example.
- **Pipeline Design for "Non-Settling" Slurries**
Estimating frictional pressure drop/flowrate relationships for pipe flow in laminar & turbulent regions from flow curve viscosity measurement or small-scale pipeflow data. Optimising pipe diameter for specified conditions. Many worked examples are given.
- **Pipe Fittings Losses for Newtonian and non-Newtonian Slurries**
Provides the loss coefficients for a wide range of pipe fittings, including elbows, bends, tees, contractions, expansions, and various valve types. They are presented according to whether the fluid is either Newtonian or non-Newtonian, and in either laminar or turbulent flow.
- **Pipeline Design for Settling Slurries**
Calculating pressure drop/flowrate relationships & deposit velocity (minimum transport velocity) for settling slurries in pipe flow. Discusses empirical correlations & two-layer model, and gives guidelines for pipe diameter & slurry flow velocity. A case study on a mica tailings slurry pipeline is included.
- **Laboratory Measurement of other Slurry Physical Properties**
Techniques for laboratory measurement of slurry physical properties including solids concentration, settling rates under gravity & particle size/size distribution.
- **On-line Flow Measurement of Slurries**
Applicability, advantages and disadvantages of a wide variety of non-invasive flowmeters discussed and selection guidelines given.
- **Discussion & End of Day 1**

TUESDAY, 8 JUNE 2010

- **Centrifugal and Rotary Positive Displacement Slurry Pumps**
Describes commercially-available centrifugal and rotary positive displacement pumps designed for slurry & paste pumping, together with their operating conditions.
- **Reciprocating Positive Displacement & Fluid Displacement Slurry Pumps**
Describes commercially-available reciprocating positive displacement and fluid displacement pumps designed for slurry & paste pumping, together with their operating conditions.
- **Selection and Sizing of Slurry Pumps**
Summarises selection methods for generic pump types, including centrifugal & positive displacement, based on key variables. Derating pumps when pumping Newtonian, non-Newtonian and settling slurries. Many worked examples are included.
- **Valves for Slurry Pipelines**
Describes the range of slurry valves available. Summarises advantages and limitations, application areas and operating conditions for generic types of slurry valves. Operating experiences in the use of these valves and guidelines for selection are given.
- **Pipe Clearing/Cleaning Methods & Systems**
Discussing options including different pig, brush and knife designs. Case studies in different industries discussed.
- **Wear in Slurry Systems**
Describes wear mechanisms and test equipment and methods. Discusses wear minimisation in slurry handling systems by the correct selection of materials & operating conditions.
- **Slurry Storage Vessel Design and Operation**
Presents an overview of the subject of slurry tank design and operation, including agitator specification and sizing. Various approaches to the design task are discussed and information on relevant research and current theories is included.

Discussion & End of Course

REGISTRATION FORM

Short Course on

SLURRY HANDLING

Calgary, Alberta, Canada : June 7 – 8, 2010

Your details

Please complete the form in block letters and tick appropriate boxes

Prof

Dr

Mr

Mrs

Miss

Ms

Surname

Forename

Position

Company

Address

Post/Zip Code

Country

Telephone

Fax

Email

Signature

Date

Please submit one Registration form for each attendee.

For payments in US Dollars

Please return this form with your payment (see overleaf) to:

BHR Group Limited, The Fluid Engineering Centre, Cranfield, Bedfordshire MK43 0AJ, UK, F.A.O. Debbie Carrington

Tel : +44 (0)1234 750422, Fax : +44 (0)1234 750074, Email: dcarrington@bhrgroup.com

Registered in England No. 2420351, VAT Reg No. 536 4271 46

For payments in Canadian Dollars only

Please return this form with your payment (see overleaf) – cheque only accepted to:

Tena McCarthy, Neotechnology Consultants Ltd, #430,910 – 7th Avenue S.W., Calgary, Alberta, Canada T2P 3N8

Cancellations

For Canadian delegates booking with Neotec Consultants and paying in Can\$: Cancellations made (up to) 30 days prior to the course date will be subject to a Can\$100 administration fee. NO REFUNDS will be given to cancellations made less than 30 days prior to the course.

For delegates booking with BHR Group and paying in US\$: Cancellations made (up to) 30 days prior to the course date will be subject to a US\$100 administration fee NO REFUNDS will be given to cancellations made less than 30 days prior to the course.

Replacement candidates are welcome.

Note that unless a minimum of 10 course delegates register and pay before 21 May 2010, the course will be cancelled and all pre-payments by course delegates refunded.

