

REGISTRATION FORM

AN INTENSIVE
SHORT COURSE
IN...

Bulk Solids Handling

*Storage, Feeding, Transfer,
Belt Conveying*

Mr/Ms/Dr:

First Name:

Surname:

Position:

Organisation:

Address:

Postcode:

Telephone:

Facsimile:

Email:

Dietary Requirements:

PAYMENT OPTIONS: Credit Card ☐ Visa ☐ Mastercard

Number:

Expiry Date:

Name on Card:

Signature:

☐ EFT Please phone for Bank Details

☐ Cheque - Made payable to TUNRA (Please post with registration form)

This registration form should be forwarded together with payment to:
TUNRA Bulk Solids
Newcastle Institute for Energy and Resources,
The University of Newcastle, Callaghan NSW 2308, Australia
Tel: +61 2 4033 9055
Email: danielle.harris@newcastle.edu.au

GENERAL INFORMATION

FEES

Early Bird Delegate Registration: \$2750 + GST
(Before 7 April 2019)
Delegate Registration: \$3250 + GST
5 or more delegates receive a 10% discount.
All fees must be paid prior to the event.

Fees include program notes, laboratory sessions
(where applicable), lunches and refreshments.

VENUE

The University of Newcastle
NIER Site
70 Vale St, Shortland NSW 2307
Tel: +61 2 4033 9055
www.bulksolids.com.au

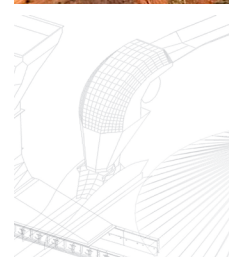
ACCOMMODATION

Delegates are invited to arrange their own
accommodation.

CANCELLATIONS

If you are unable to attend the event a substitute
delegate is welcomed at no extra charge. If
notification of withdrawal is received no less than
14 days prior to the event, 80% of the fee will be
refunded. No refunds will be made if notification
of cancellation is received less than 13 days
prior to the date of the event. The organisers
reserve the right to alter or cancel the program
due to unforeseen circumstances. In the event of
cancellation, a full refund of fees will be made.

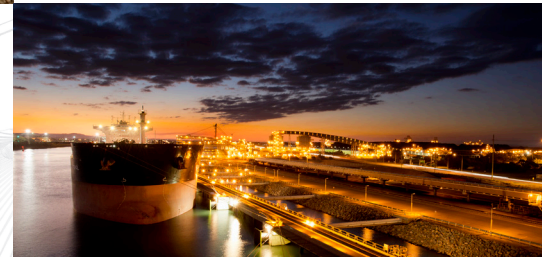
CERTIFIED MANAGEMENT SYSTEM



Bulk Solids Handling

Storage, Feeding, Transfer,
Belt Conveying

3-Day Course
8 - 10 May 2019
NEWCASTLE



Presented at
THE UNIVERSITY OF NEWCASTLE
CALLAGHAN, NSW

COURSE PRESENTERS

ALAN ROBERTS



Emeritus Professor Alan Roberts AM is the Founding Director of TUNRA Bulk Solids. He is an Honorary Fellow of Engineers Australia, Member of the I Mech. E. (U.K.) and Fellow of the Australian Academy of Technological Sciences and Engineering. He has received several awards including: Institution Award Medal, Sir George Julius and A.G.M. Michell Medals from Engineers Australia, Solids Handling Award, Institution of Mechanical Engineers U.K.; Lifetime Achievement Award of British Materials Handling Board, Member of the Order of Australia and Centenary Medal. His research and consulting in the field of bulk solids handling spans a period of 50 years. He has published 5 design manuals and over 350 research papers.

CRAIG WHEELER



Professor Craig Wheeler is the Associate Director of TUNRA Bulk Solids and the Centre for Bulk Solids and is a Professor of Mechanical Engineering at the University of Newcastle, Australia. He worked for 10 years with BHP Billiton in Australia in a variety of engineering positions, including maintenance, production and design. Since joining the University he has worked as a consultant for TUNRA Bulk Solids for 20 years. His research is focused on reducing the energy intensity and environmental impact of ore and mineral transportation globally. His research develops new theoretical approaches to model and optimise belt conveyor and bulk handling systems.

TIM DONOHUE

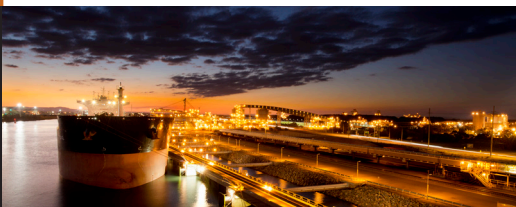


Dr Tim Donohue is the Business Unit Manager of TUNRA Bulk Solids (TBS). Tim is responsible for the overall operation of TBS and has completed a significant number of projects in the materials handling field. Tim operates across all aspects of the business including flow property testing, the provision of specialised testing services such as wear testing, along with general consulting projects. His expertise lies in transfer chute design, bin and hopper design and numerical modelling. Discrete Element Modelling (DEM) is being used more widely in the materials handling field and TBS keeps abreast of new advancements through Tim's presence on the scientific committee for the international conference series on DEM. Through both research and consulting projects Tim has built significant experience in the bulk materials field to deliver value to Clients through solving industry problems.

DANIEL AUSLING



Mr Daniel Ausling is a Senior Research and Consulting Engineer at TUNRA Bulk Solids. Furthermore, he has been involved in the field of bulk solids handling since 2003 when he received an industry scholarship with TUNRA Bulk Solids lasting the duration of his undergraduate studies. He has worked across all facets of the business from material testing, transfer chute design, simulation and conveyor design. Daniel currently manages the materials testing and analysis operations of TUNRA Bulk Solids.



3 DAY COURSE OUTLINE

INTRODUCTION

- Brief historical review
- Gravity discharge – Modes of flow
- Mass flow, Funnel flow, Expanded flow, Intermediate flow
- Typical storage bin shapes – Industrial case studies
- Influence of bin discharge flow patterns on wall loads and structural integrity

FLOW PROPERTIES

- Gravity reclaim stockpiles
- Description of test equipment and procedures
- Influence of storage time and environmental factors such as temperature and moisture
- Evaluation of hopper and chute lining materials for friction and wear

MASS FLOW & FUNNEL FLOW

- Mass-flow and funnel-flow limits
- Basic bin shapes
- Interpretation of flow property reports in relation to bin and stockpile design
- Case study examples to illustrate operational problems and how they were overcome
- Dynamic modelling of bulk solids systems

STOCKPILE DESIGN

- Influence of consolidation stresses on rathole geometry, draw-down and live capacity
- Selection and positioning of reclaim hoppers and feeders for optimising gravity reclaim
- Stockpile base pressures and loads on reclaim tunnels, hoppers and feeders

WALL LOADS

- Symmetric, Eccentric Discharge
- Silo Quaking and Shock Loads
- Loads on Buried Structural Elements

FEEDERS

- Importance of hopper and feeder interfacing
- Review of basic feeder types – belt, apron, vibratory, screw, plough, tube
- Determination of optimum hopper and feeder interfacing for uniform draw-down
- Determination of feeder loads, torque and power initial and running conditions
- Controlling feeder loads and start-up torque
- Modelling of large ROM feeders

TRANSFER CHUTES

- Basic principles of chute design
- Application of flow properties in the design process
- Chute flow problems due to adhesion and wear
- Dynamic modelling of hood and spoon for optimum accelerated flow
- Optimising chute profile for feeding and transfer
- Optimising chute geometry for controlled wear in the flow zone and at belt feed point
- Dust control in transfer chutes
- Application of DEM and CFD in chute design and performance evaluation

BELT CONVEYING

- Overview of open and closed systems. Special belt conveyors and conveyor selection recommendations
- Review of basic design procedures
- Economic and technical considerations in optimising conveyor design
- Analysis of main resistances – idler indentation, idler spacing, bearings and seals, stress states in bulk solids and contribution to drag.

3 DAY COURSE OUTLINE

LEARNING OUTCOMES

- Basic principles of handling plant design
- Bulk solid flow properties and application to design
- Loads on bin walls – symmetric, eccentric discharge – shock loads and silo quaking
- Stockpile design incorporating draw-down, live capacity, base loads and locations of reclaim hoppers, feeders and tunnels
- Loads on buried structures in bins and stockpiles
- Chute design for feeding and transfer
- Belt conveying – overview of various types of conveyors – bulk solids and conveyor belt interactions – review of basic design procedures and future developments

ABOUT TUNRA BULK SOLIDS

TUNRA Bulk Solids Handling Research Associates (TBS) is built upon the strong foundations of education, research and consultancy in Bulk Solids Technology, which have been in place at Newcastle, Australia for over 40 years. TBS is located at The University of Newcastle in the NIER precinct.

TBS provides contract research, professional consultancy and education to the resource and process industries, having completed over 4000 research and consultancy projects for approximately 1000 companies in Australia and 40 other countries. The group is averaging over 250 industrial projects per year.



FURTHER INFORMATION

Should you require any further information regarding the course, please contact:

TUNRA Bulk Solids

The University of Newcastle

Callaghan NSW 2308, Australia

Tel: +61 2 4033 9055

Email: danielle.harris@newcastle.edu.au

www.bulksolids.com.au

