

## 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)

Please note we do not accept AMEX

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: \$2950 + GST  
(Before 18 April 2021)  
Delegate Registration: \$3450 + 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.  
Please note course presenters are subject to  
change.

### VENUE

The University of Newcastle  
NIER Site, A Block  
70 Vale St, Shortland NSW 2307  
+61 2 4033 9039  
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.



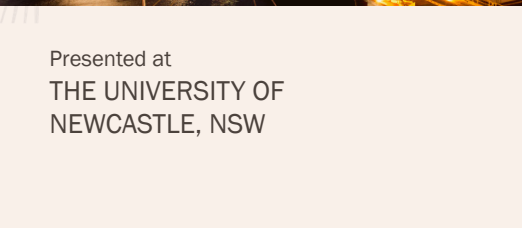
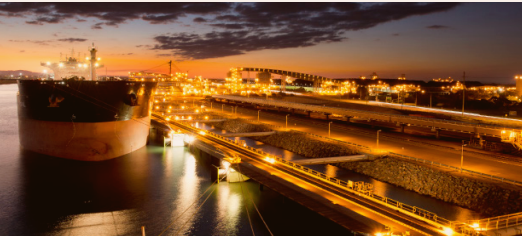
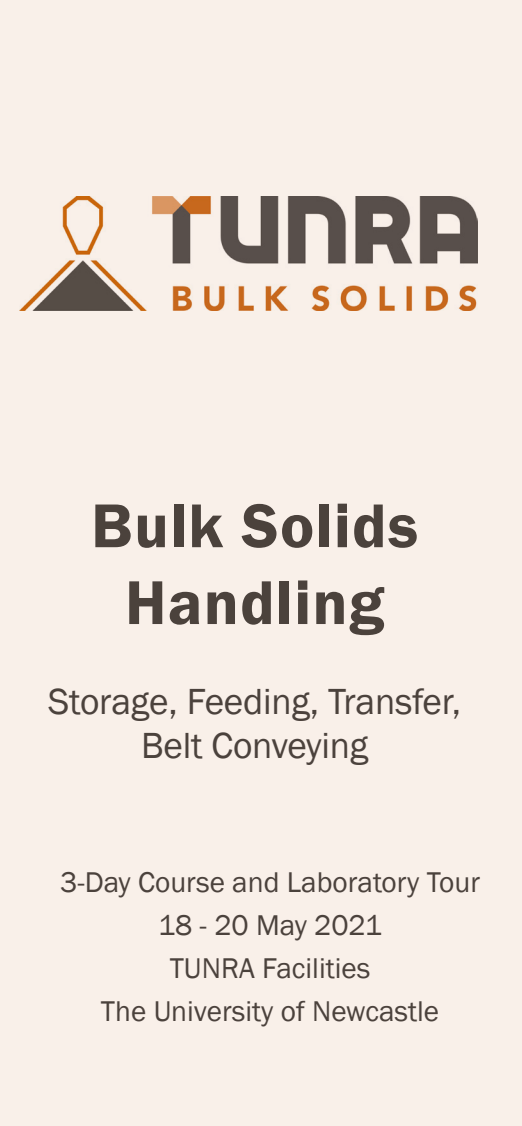
QMS Certification Services



QMS Certification Services



QMS Certification Services



Presented at  
THE UNIVERSITY OF  
NEWCASTLE, NSW



# Bulk Solids Handling

Storage, Feeding, Transfer,  
Belt Conveying

3-Day Course and Laboratory Tour  
18 - 20 May 2021  
TUNRA Facilities  
The University of Newcastle

## OVERVIEW

### BULK MATERIALS HANDLING

The storage, handling and transportation of bulk solid materials are major activities for a vast number and variety of industries throughout the world. These range from the gentle handling of very small quantities of material in the pharmaceutical and chemical industries to the vast quantities handled and processed by the mining and mineral companies. This diversity is particularly evident in Australia where the wide-ranging nature and scale of operations is somewhat unique.

Considerable advances continue to be made in research, development, application and implementation of the technologies associated with various aspects of bulk solids handling. This course will be of particular interest to a wide range of industries including:

- Mining and mineral production and processing
- Power generation
- Energy and environment
- Chemical and petrochemical process industries
- Agriculture processing and production
- Manufacturing
- Pharmaceuticals
- Food industry

### ABOUT TUNRA BULK SOLIDS

TUNRA Bulk Solids are world leaders in applied and fundamental bulk solids handling research and have been in business for more than 40 years. TUNRA has built a strong reputation in industry for its professional services and world class research in materials handling and flow properties. TUNRA have completed more than 4,000 projects for over 1,000 companies across Australia and more than 40 countries internationally.

Comprehensive laboratory test facilities are available at TUNRA to aid research and consulting activities at the University of Newcastle. TUNRA is committed to forming long term partnerships with business to help them overcome existing handling problems and assist with planning projects to ensure trouble-free plant operation

### WHY ATTEND THIS COURSE

- Diversify your expertise and further knowledge of materials handling concepts
- Professional Development (CPD hours)
- Increase awareness of material phenomena occurring on site
- Learn methods for troubleshooting, optimisation and best practice design
- Develop skills in fundamental and numerical analysis approaches
- Learn how to apply flow properties test results to benefit your operation or designs
- Stay up to date with the latest developments in industry and bulk solids research



## 3 DAY COURSE OUTLINE

### FLOW PROPERTIES TESTING

- 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
- Application specific testing (inc. Dust and TML)
- Analysis and application

### MASS FLOW & FUNNEL FLOW

- Mass-flow and funnel-flow design procedures
- Basic and hopper geometry
- Interpretation of flow property reports in relation to bin design
- Case studies
- Dynamic modelling of bulk solids systems

### STOCKPILE DESIGN

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

### D.E.M ANALYSIS

- Introduction to the Discrete Element Method
- Modelling approaches and limitations
- Overview of critical model parameters including particle size and shape
- Considerations and best practices for industrial application

### WALL LOADS

- Application of AS3774 for static and flow load cases
- Gate Loads
- Symmetric versus Eccentric Discharge
- Silo Quaking and Shock Loads
- Loads on Buried Structural Elements

### FEEDERS

- Importance of hopper and feeder interfacing
- Review of basic feeder types
- 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

### 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 profiles for feeding and transfer
- Optimising chute geometry for controlled wear in the flow zone and at the 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.
- Specialised testing

## 3 DAY COURSE INFORMATION

### COURSE 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
- Discrete Element Modelling (DEM) fundamentals and application
- 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

### COURSE PRESENTERS

Emeritus Professor Alan Roberts founded TUNRA Bulk Solids in 1975 to facilitate research and consulting services in bulk materials handling. Following Alan's long standing commitment to the bulk handling industry, he developed, guided and led a team of experts at TUNRA Bulk Solid who continue to be at the forefront of the materials handling industry. Following in Alan's footsteps, TUNRA continues to offer professional training courses to industry as a part of our commitment to continuous improvement of the materials handling field. These training courses are run by a minimum of 3 experts from our engineering group who are specialists in their fields.

### FURTHER INFORMATION

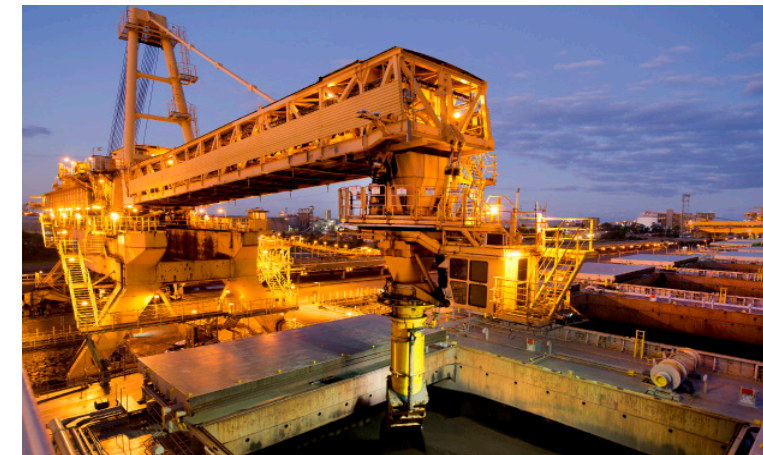
Should you require any further information regarding the course, please contact:

TUNRA Bulk Solids  
The University of Newcastle  
Callaghan NSW 2308, Australia

Tel: +61 2 4033 9055

Email: [danielle.harris@newcastle.edu.au](mailto:danielle.harris@newcastle.edu.au)

[www.bulksolids.com.au](http://www.bulksolids.com.au)



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NEWCASTLE  
AUSTRALIA