

## REGISTRATION FORM

AN INTENSIVE  
SHORT COURSE  
IN...

# Bulk Solids Handling

*Storage, Feeding, Transfer,  
Belt Conveying*

Title: .....

First Name: .....

Surname: .....

Position: .....

Organisation: .....

Address: .....

Telephone: .....

Email: .....

Dietary Requirement: .....

### PAYMENT OPTIONS:

Credit Card ☐ Visa ☐ Mastercard

For credit card payments please email [Danielle.Harris@newcastle.edu.au](mailto:Danielle.Harris@newcastle.edu.au) to obtain a link to an online payment portal (please note we do not accept AMEX).

☐ Purchase Order

This registration form should be forwarded 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](mailto:danielle.harris@newcastle.edu.au)

## GENERAL INFORMATION

### FEES

Early Bird Delegate Registration: \$3,250 + GST  
(Before 13 July 2024)  
Delegate Registration: \$3,750 + GST  
5 or more delegates receive a 10% discount.  
All fees are in Australian dollars must be paid prior to the event. Fees include electronic program notes, lunches, refreshments and a site tour of TUNRA's comprehensive laboratory and workshop facilities.

### VENUE

TUNRA Bulk Solids  
NIER Site, A Block  
70 Vale St, Shortland  
NSW 2307

### SESSION SCHEDULE

3-Day Course  
8:30 am - 5:00 pm 13th August  
9:00 am - 5:00 pm 14th August  
9:00 am - 4:00 pm 15th August

### CANCELLATIONS

All face-to-face courses are subject to current COVID government regulations. 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 course due to unforeseen circumstances. In the event of cancellation, a full refund of fees will be made.

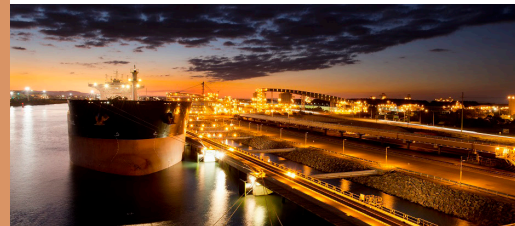
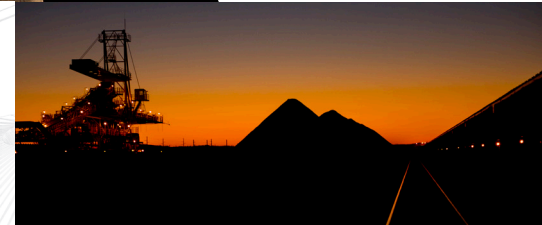
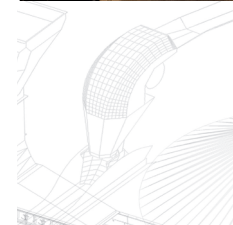


# Bulk Solids Handling

Storage, Feeding, Transfer,  
Belt Conveying

3-Day Course  
& Site Tour  
13th - 15th August 2024

Newcastle N.S.W.



Presented at  
**TUNRA Bulk Solids**  
University of Newcastle  
Newcastle, N.S.W

## OVERVIEW

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 large 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

**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 which are ISO 9001, ISO45001 and ISO14001 certified, are available at TUNRA to aid research and consulting activities at the University of Newcastle. TUNRA is committed to forming long term partnerships with businesses to help them overcome existing handling problems and assist with planning projects to ensure trouble-free plant operation.

**The Centre for Bulk Solids and Particulate Technologies** (CBSPT) is actively involved in both fundamental and applied research on a range of problems associated with bulk solids and particulate technology. Research areas include storage, flow, processing and transportation of bulk solids.

It was established in 1995 and supported by the Australian Research Council (ARC) as one of a prestigious handful of national Key Centres of Teaching and Research between the University of Newcastle and the University of Wollongong. The Centre's Newcastle Node is strongly linked with TUNRA Bulk Solids and the Faculty of Engineering & Built Environment at the University of Newcastle.

## THE CENTRE FOR BULK SOLIDS

## ABOUT TUNRA BULK SOLIDS

## 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 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 for 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

### 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

### 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 9039  
Email: [danielle.harris@newcastle.edu.au](mailto:danielle.harris@newcastle.edu.au)  
[www.bulksolids.com.au](http://www.bulksolids.com.au)

