



**Understanding the Total Cost of Ownership – how to avoid future problems and buy bulk solids handling equipment intelligently**

**Wednesday 26 & Thursday 27 October 2021, ONLINE 13:00 - 17:00 UK TIME**

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**WHY THE NEED FOR THIS COURSE?** All too often the operational requirements of the equipment to be supplied to bulk terminals is not properly understood by either the buyers or the sellers. Purchase decisions purely based on price or a lack of knowledge of the characteristics of the material to be handled – or frequently both – will fail to understand the true cost of a bulk solids handling system to a business in terms of down-time; energy; maintenance and manning.

The **OBJECTIVE OF THE COURSE** is to raise awareness amongst bulk terminal buyers of the need to behave in a better-informed way and equipment suppliers to understand the operational needs of the equipment they are supplying.

The course will be delivered online through **EXPERT PRESENTATIONS, CASE STUDIES** and **GROUP WORKING** facilitated by The Wolfson Centre for Bulk Solids Handling Technology and the Solids Handling & Processing Association (SHAPA).

**KEY TAKAWAYS:** The course will give both terminal operators and equipment manufacturers an insight into what should be on the one side be specified, and on the other side supplied.

**COURSE TUTORS**

Professor **Mike Bradley** BSc Hons, PhD, Director, The Wolfson Centre for Bulk Solids Handling Technology, University of Greenwich

**Eddie McGee**, Managing Director, Ajax Equipment Ltd

**Charles Williams**, Director, Promtek and Chairman Technical Committee, SHAPA

**COURSE INCLUSIONS**

- ❖ Nature of the problem
- ❖ The Hall of Shame – *examples of projects that have gone off the rails*
- ❖ Quantifying how high the risk is – *a review of the Rand Report findings*
- ❖ Understanding why technical risk is so high with bulk solids handling projects
- ❖ Know your enemy – *materials for design and for controlling technical risk*
- ❖ Practical approach to design to accommodate material characteristics
- ❖ The virtue of the bespoke suit over *prêt-à-porter*
- ❖ A project management approach is not enough – *understanding the true cost of a bulk solids handling system to a business*
- ❖ **CASE STUDIES:** Risk management in solids handling projects – examples of good practice in bulk handling project procurement and some projects that managed significant risks effectively
- ❖ **DISCUSSION GROUPS** – *delegates break into groups under the supervision of the course tutors to discuss how well they currently apply best practice, what they can improve for the future and the difficulties to be overcome*

**COURSE TUTORS**



**Professor Mike Bradley BSc Hons, PhD, Professor of Bulk and Particulate Technologies, The University of Greenwich; Director, The Wolfson Centre for Bulk Solids Handling Technology; Chairman, Solids Handling & Processing Association (SHAPA) and ABTO Members' Advisory Panel**

After doing an apprenticeship with BAE Systems, Mike took a first degree at Thames Polytechnic and then worked in the Flight Automation Research Laboratory at BAE.

He returned to Thames Polytechnic to do a PhD in Design Methods for Pneumatic Conveying Systems. After his PhD Mike failed to reach escape velocity from The Wolfson Centre, becoming first a consultant, then Manager and finally Director in 2000. He was elevated to the status of Professor in 2006.

Mike also has a small business in property, and co-founded WorkSafe Design, a company developing advanced PPE for infectious disease protection. In his spare time Mike is a competition dancer, and has qualified to compete in national events on more than one occasion in both ballroom and Latin American disciplines.



**Eddie McGee, Managing Director, Ajax Equipment Ltd**

Eddie is an experienced Managing Director with three decades in engineering providing solutions for many, varied solids handling projects in chemical, pharmaceutical, nuclear, waste, food, confectionery and other industries.

He is routinely involved in the detailed specification, design and supply of bespoke screw feeders, conveyors, elevators, mixers and lump breakers, as well as ancillary items such as hoppers, intermediate bulk containers etc. Eddie is a Member (and Past Chairman) of the Institution of Mechanical Engineers (IMechE) Bulk Materials Handling Committee, the European Federation of Chemical Engineering Working Party on Mechanics of Particulate Solids and the Solids Handling and Processing Association's Technical Committee.

Eddie has a PhD from Glasgow Caledonian University for his work on characterisation and flow behaviour in hoppers and screw feeders and in 2008 he was presented with the IMechE Bulk Materials Award for Innovation. Eddie has authored papers for conferences and seminars in UK, Germany, Italy, Norway and the USA.



### **Charles Williams, Director, Promtek and Chairman, Technical Committee, SHAPA**

Graduating from the University of Manchester in 2001 with a 2:1 MEng (Hons) in Electronic Engineering, with a year well spent at the Technische Universität Berlin, Germany, Charles spent two years backpacking around the world before returning to the UK to take up a software engineering position at Renishaw plc.

Four years later he became an English language teaching assistant for schools on the subtropical island of Amami Oshima, Japan, with the prestigious JET Programme, before finally joining the management team at Promtek, his family's 40-year-old ingredients handling systems engineering firm.

Since then Charles has specified, implemented and supported projects, working with a variety of equipment suppliers and stakeholders at a wide range of factories in the UK, Europe, North America and Africa and more recently opened a full subsidiary in Cape Town to support the client base in Southern Africa.

### **REGISTRATION AND COURSE FEES**

**Course fees: £700.00 (£600.00 for ABTO and SHAPA members)**

**To register please follow [this link](#)**

**To discuss and for further details please contact Simon Gutteridge  
+33 (0)321 47 72 19 [events@bulkterminals.org](mailto:events@bulkterminals.org) [www.bulkterminals.org](http://www.bulkterminals.org)**

**PROGRAMME**

**Wednesday 26 and Thursday 28 October 2022, 13:00 – 17:00 UK TIME ONLINE**

**DAY ONE: Nature of the Problem**

**Wednesday 26 October 2022: 13:00 – 17:00 GMT**

**Day One Course Leader's Introduction**

*Professor Mike Bradley BSc Hons, PhD, Director, The Wolfson Centre for Bulk Solids Handling Technology, University of Greenwich and Chairman, SHAPA ±10 minutes*

**The Hall of Shame – examples of projects that have gone off the rails to greater or lesser degree**

Many troubleshooting projects, both large and small, arrive at the door of The Wolfson Centre, invariably having a history which has landed them in trouble. A number of examples will be examined to show how the well-intentioned ignorance of engineers, designers and project managers have led to severe difficulties.

*Professor Mike Bradley ±25 minutes*

**Quantifying how high the risk is – a review of the Rand Report findings**

This report analysed cost over-runs and performance shortfalls on 40 new process plants. It showed that plants operating with bulk solids feedstocks have a very bad track record, and exposed the reasons. The findings will be reviewed, including the lessons to be learned about the need to apply more attention to the solids flow and handling aspects of plant design and procurement.

*Professor Mike Bradley ±25 minutes*

**Break ±20 minutes**

**Understanding why technical risk is so high with bulk solids handling projects**

To contain technical risk, project managers and engineers need to understand what the risks are and why they arise. With Bulk Solids Handling not being taught as a subject during the education of most engineers, in general they are unaware of the dangers, let alone how to control them. This session will use case studies of problematic projects to expose the matter and show to spot and control potential sources of technical risk, including:

- Unexpected materials behaviour
- Unforeseen difficulties arising from the operating context
- Lack of clarity in user expectations
- Whose responsibility it is to manage the risk
- Laying-off of risk down the project chain
- "Value Engineering"
- Changing source and quality of feedstock supply

*Professor Mike Bradley ±60 minutes*

**Know your enemy – materials for design and for controlling technical risk**

Reliable discharge of bulk solids can be a big challenge especially when material characteristics change. This session will introduce the audience to

- Material characterisation
- Importance of material characterisation
- Effect of change in material characteristics on flow behaviour and hence the equipment design

*Dr Baldeep Kaur BSc, MSc, PhD, Research Fellow, The Wolfson Centre for Bulk Solids Handling Technology, University of Greenwich ±40 minutes*

**Discussion groups – delegates break into groups under the supervision of the course tutors to discuss how well they now understand the problems**

- Report back
  - Analyse and gather lessons learned
  - Actions to take away
- ± 60 minutes

**17:00 Close of day one**

**DAY TWO: Learning the Lessons and Applying Best Practice  
Thursday 28 October 2022**

**13:00 Day Two Course Leader's Introduction**

*Ian Birkinshaw MSc, General Secretary, Solids Handling & Processing Association (SHAPA)*  
±10 minutes

**Practical approach to design to accommodate material characteristics**

Solids handling is one of the largest and most common processes in many industries though it is often impeded by problems that arise in the storage and handling of bulk solids. This session will provide guidance for the effective handling of bulk solids.

- Some of the problems that are often encountered – arching, ratholing, etc
- Characterisation needs for storage, flow and handling including flow property tests
- Design of hoppers for reliable discharge – mass flow
- Interfacing of feeders for enhancing flow, focusing on screw feeders
- Offer some retrofit options where performance is poor
- CASE STUDIES solving real plant operating problems

*Dr Eddie McGee, Managing Director, Ajax Equipment Ltd ±35 minutes*

**The virtue of the bespoke suit over prêt-à-porter**

Standard off-the-shelf equipment may be more readily available and initially cheaper but think carefully before buying. There are hidden costs associated with the integration and performance that may be compromised, and the results may not be quite as expected. Bespoke equipment may offer a more cost-effective solution that provides better performance.

- Off the shelf is not designed for your purpose
- The importance of quality
- Spending time and money on good design is time and money well spent

*Speaker to be confirmed ±35 minutes*

**Break ±20 minutes**

**A project management approach is not enough – understanding the true cost of a solids handling system to a business**

Without a thorough understanding of the true cost of a solids handling system to a business, a project management approach is not enough. One of the primary constraints of the process which will be identified in the project documentation and created at the beginning, will be the budget. Without a full understanding of the true costs the budget figure cannot be accurately set.

- Down-time
- Energy
- Maintenance
- Manning
- Purchase price
- The problems with competitive tendering and turnkey projects.

*Charles Williams, Director, Promtek and Chairman, Technical Committee, SHAPA and Dr Eddie McGee ±45 minutes*

**CASE STUDY: Drax Power Ecostore Project – a challenging project where some of the best practice techniques were used**

*Professor Mike Bradley ±35 minutes*

**Discussion groups – delegates break into groups under the supervision of the course tutors to discuss how well they currently apply best practice, what they can improve for the future and the difficulties to be overcome**

- Report back
  - Analyse and gather lessons learned
  - Actions to take away
- ±60 minutes

**Course Leaders' Conclusions**

*Professor Mike Bradley and Ian Birkinshaw ±5 minutes*

**17:00 Close of day two**



*With thanks to our partner associations for their support*

