

Case Study: Cameron

Knowledge exchange offers new insights into gas treatment processes

The challenge

Deep water gas production requires sea bed pipelines at increased depths and distances as gas demand increases and older, shallower, fields deplete. The low temperatures and extreme pressures found at such depths pose a challenge for production engineers as the gas and water form solid particles called hydrates that agglomerate and cause pipeline blockages. To solve this problem, monoethylene glycol (MEG) can be injected into the pipelines to prevent the formation of hydrates.

The increased practice of MEG injection is opening up new opportunities to sell processes that can reclaim MEG from pipelines for reuse, leading to improved economic and environmental performance. To exploit the market opportunities associated with MEG reclamation, Cameron's Process Systems division were keen to access The University of Manchester's world leading expertise.

The University of Manchester solution

An 'Exploitation Secondment' knowledge transfer project partnered Cameron with world-leading academics from the School of Chemical Engineering and Analytical Science (CEAS) at The University of Manchester. In doing so Cameron gains access to specialist expertise in the fundamentals of modelling for multiphase systems, corrosion, crystallisation, and solids separation – all of which are integral to Cameron's PUREMEG® MEG reclamation process. The three year collaborative project covers the following activities:

- **Technical experiments** investigating key processes, such as salt crystallization in mixed solvents, facilitates knowledge transfer and has led to new insights in the MEG Reclamation process.
- **Industrial trials** develops extensive in-house knowledge of end-users' successful operation strategies for real plant fluids with diverse characteristics.
- **Management tasks** have focused on best practice for embedding the newly acquired knowledge within the company, enabling successful exploitation.

Cameron also benefits from use of the University's unique pilot scale laboratories, where they have installed a bespoke PUREMEG® MEG reclamation pilot rig over three storeys, which is capable of replicating real plant conditions to aid the improvement of industrial equipment and process design.

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In the 35 years I've been in this industry, I've never been as excited by anything as much as the research being carried out here.

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Gary Sams,
Process Systems' Director
of Research and Development,
Cameron



Cameron is a leading provider of flow equipment products, systems and services to worldwide oil, gas and process industries. Employing over 27,000 people, Cameron operates around the world from more than 300 locations covering virtually all of the world's oil and gas operating basins.

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The benefits

The 'Exploitation Secondment' provides an invaluable platform for Cameron and The University of Manchester to advance their knowledge of the complex processes occurring in MEG reclamation units. These new capabilities are being embedded within the company to enable it to generate ideas for further process improvements in this area. Other benefits include:

- £1M state-of-the-art pilot scale PUREMEG® MEG reclamation rig was donated to the University on commencement of the project, providing hundreds of researchers and students with unique hands on experience of industrial applications.
- The project has raised the University's international profile. In 2011, over 90 delegates from major oil and gas producers attended the PUREMEG® pilot plant launch event at the University. This generated world-wide press attention which has led to an increase in applications from international students interested in associated projects.
- The collaboration has led to extensive follow-on activity. Further investment has been made by Cameron for a bench scale version of the PUREMEG® process to be used in various research and industrial projects, generated as a result of the knowledge transfer project.
- Cameron is able to demonstrate their proprietary technology at a suitable scale within the University. This evidence base has helped boost sales of their PUREMEG® MEG Reclamation and Regeneration units.

Importantly, this project has cemented the relationship between Cameron and the University. "Cameron has benefitted from partnering with The University of Manchester beyond knowledge transfer from the University into Cameron's PUREMEG® technology," says Brian Messenger, Cameron's Senior R&D Engineer. "Cameron's HR Department has established links with the University to facilitate recruitment of University of Manchester graduates on to Cameron's graduate training programme."

For the academic team the project has provided an exceptional opportunity to apply specialist techniques and knowledge developed at the laboratory scale to a pilot scale process. The researchers have been sponsored to present the findings at international conferences and a project researcher has secured a role with Statoil as a result of the newly acquired expertise in MEG technology.

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The project has opened up the oil and gas sector to my multiphase processing research group, initiating numerous research projects. Every year hundreds of undergraduates now benefit from using the processes in our state-of-the-art facilities.”

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*Dr. Peter Martin,
School of Chemical Engineering
& Analytical Science,
The University of Manchester.*