Knowledge Transfer Partnerships

KTP BENEFITS

Knowledge Transfer Partnerships are designed to benefit everyone involved

- Businesses will acquire new knowledge and expertise

- KTP Associates will gain business-based experience and personal and professional development opportunities

- Universities, colleges or research organisations will bring their experience to enhance the business relevance of their research and teaching

Knowledge Transfer Partnerships
Accelerating business innovation;
a Technology Strategy Board programme

http://www.ktponline.org.uk

ALCOA
KTP DELIVERS AS SCHEDULED

ABOUT THIS CASE STUDY

Alcoa is the world's leading producer of primary and fabricated aluminium, with an annual turnover in excess of $20 billion. Working with Academic Partner University of Leicester, the aim of the Knowledge Transfer Partnership (KTP) was to introduce process efficiencies to increase throughput and capacity.

ABOUT THE SPONSOR

The Engineering and Physical Sciences Research Council (EPSRC) is the UK Government's leading funding agency for research and training in engineering and the physical sciences.

FAST FACTS

- Significant cost and productivity benefits to company

- Reduction in plant downtime with increase in plant efficiency

- Development of Artificial Intelligence (AI) software

- Implemented improved scheduling system

- Associate won prestigious 'Business Leader of Tomorrow' award

The Company

"We have found the KTP programme to be one of the most effective ways of working with universities. It provides us with a high calibre individual and also a strong support network from the University. The University of Leicester's research had provided us with a good foundation and methodology for scheduling our processes."

Steve Lowes, Technical Team Manager - Plate Production at Alcoa, Europe

Alcoa operates in 41 countries and its products are used in a vast range of industrial and consumer applications. The Kitts Green plant in Birmingham produces high quality flat rolled aluminium plate, particularly for the aerospace sector.

ABOUT THE PROJECT

Alcoa needed to introduce manufacturing process efficiencies that would boost throughput and therefore increase capacity.

Specific operational areas for improvements were targeted in maximising the efficiency of the rolling mill (which rolls the aluminium plate) and optimising the soaking pit process (where the raw material is heated and maintained at the right temperature prior to rolling).

Research work undertaken by the University of Leicester had established a new methodology for scheduling the rolling process. However, turning this into an effective and very specific industrial application required effective knowledge transfer between the University and Alcoa.

An innovative Knowledge Transfer Programme (KTP) was set up with the Department of Engineering, University of Leicester that entailed distinct stages, including establishing clear and precise timings for plate rolling using Artificial Intelligence (AI) techniques. The rolling mill needed to be kept in constant use to maximise productivity. Without this efficiency, either the rolling mill or the soaking pits could become a bottleneck.

Similar scientific techniques are being used to establish more precise optimum heating times of material in the furnaces.

The AI software developed through the University works in synergy with Alcoa's new Advanced Planning and Scheduling software. The complete solution enables dynamic scheduling of the process by creating meaning from furnace control system feedback.

RESULTS

- The project is set to bring significant cost and productivity benefits to Alcoa
- The implementation of an accurate scheduling system which will increase the efficiency of the furnaces, reduce energy use and costs and improve throughput

The Associate

The Associate registered as an MPhil student at Leicester, and provided the necessary skills in process engineering and Artificial Intelligence (AI).

The Associate's core project was the development of Advanced Planning Scheduling software. The Associate also played a major role in fault diagnosis, resulting in a machine running with 100% reliability at five times its previous speed.

The Associate benefited from training in production and scheduling techniques and the application of AI in an industrial setting. The Associate developed skills in technical and non-technical areas, playing a significant role in day-to-day operations - dealing not only with technical problems but bringing departments together to achieve a common goal.

RESULTS

- In recognition of the quality and range of work undertaken, the Associate was the winner of a prestigious "Business Leaders of Tomorrow" award at the 2004 Knowledge Transfer Partnerships Awards event
- Gained an NVQ Level 4 in Management

The Academic Partner

University of Leicester

"It is sometimes difficult to persuade companies to accept new ideas and techniques from academics. This was not the case with Alcoa thanks to the Associate who was able to communicate effectively with colleagues at all levels gaining everyone's confidence."

Professor Postlethwaite, lead academic supervisor at the Department of Engineering, University of Leicester.

The Alcoa KTP project was facilitated by the University of Leicester's Department of Engineering. The programme was supported by academic supervisors Professor Ian Postlethwaite and Dr Da-Wei Gu.

BENEFITS

The project has added significantly to the department's knowledge and expertise in the areas of Artificial Intelligence (AI) and process scheduling and has further strengthened collaborative links between the University and its industrial partners. The results can also be used in teaching in the form of case studies to help motivate undergraduates.

RESULTS

- Case studies provided for undergraduate studies
- The chance to see their methodology put into industrial practice
- Strengthened links between the University and its industrial partners