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WTIA National Diffusion Networks
Project (NDNP) funded by the
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SUCCESS STORY NUMBER M06: GERMAN STUDENT CONTRIBUTES TO MINING PROJECTS – *WA mining giant Pilbara Iron plays host, with benefits for the industry Australia-wide*

Background

Andreas Kaufmann came to Tom Price in Western Australia to undertake his three-month internship with Pilbara Iron, a member of the NDNP Mining Industry Sectoral Project, prior to completing his final year of studies. Andy is a student of Professor Volkmar Schuler of the German University of Ulm, School of Applied Sciences, who visited Australia in 2004 to work with the WTIA and presented interesting workshops around Australia on AC-MIG, Brazing and Flame Straightening of Steel.

Stephen Oswald (Specialist Technical Advisor - Pilbara Iron) and Professor Ian Henderson (WTIA WA Technology Manager) organised a program for Andy which would provide benefits to both him and Pilbara Iron.

Fume during cutting processes

A first project involved a review of plasma cutting of cast white iron wear plates and a comparison with alternative processes such as high-pressure water. Fume measurement was critical to this review as well as improved operating conditions. A review of safe working procedures was also undertaken. Andy also undertook some trials of optimised procedures, with testing and resulting recommendations.

Lifting lugs on a range of materials

A second project was to review the safe procedures for the welding of lifting lugs to equipment made from three wear resistant materials commonly used in the mining industry:

- Quench and tempered steels: used as the wear plates in haul truck trays with Brinell hardness of 400 -500 BHN.
- Manganese steels: used as crusher liners and have mild steel lugs welded to permit installation and removal.
- White iron such as Nihard 4-600 and 15/5 chromium molybdenum grades are used typically in fixed plant providing excellent wear resistant but have poor impact resistance and weldability.

Trials were conducted to identify optimum welding conditions for the attachment of lifting lugs. These materials require particular attention to welding and different procedures for the successful application of lifting lugs were developed.

The data collected was fed back to the WTIA through the Mining ISP for incorporation into the Technical Guidance Note being prepared as an output of the NDNP which will be distributed free to industry in Australia.



Andy inspecting the wear components on the O&K RH200 hydraulic face shovel used for the mining of iron ore.

The outputs

Andy completes his internship in March 2006, and will have gained many new experiences. Working in the Pilbara over the summer period when the temperatures are typically in excess of 40°C, was a great contrast to Germany which experiences temperatures in winter of -10°C and sometimes as low as -20°C. Moving from the dry environment in the field to the laboratory situation produced its own physical difficulties. These challenges, however, provided Andy with an insight into what is experienced in the real life of industry.

On returning to Germany Andy will make a presentation to 300 students and lecturers on the outcome of his work and experiences. The work he undertook will complement Pilbara Iron's fume minimisation programme, as well as contribute to improved procedures for welding lifting lugs for industry Australia-wide.

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