

Australian Industry

WINS!

WTIA National Diffusion Networks Project (NDNP) funded by the Federal and State and Territory Governments and industry



SUCCESS STORY NUMBER R07: RAIL WELDING TECHNOLOGIES AND OVERSEAS INNOVATIONS – *Forums bring latest information to the Australian rail industry*

Rail Industry Initiatives

Through the work of the WTIA Rail Industry Sectoral Project and the SMART Rail Industry Group comprising representatives from RailCorp, Queensland Rail, EDI Rail and Bombardier, a host of very successful and positive initiatives took place during the past 2 years to enhance the Australian Rail Industry.

A very successful workshop, attended by 19 specialists from the rail industry, was held in Sydney in May 2006 to introduce a number of excellent outcomes of the WTIA's NDNP in the field of rail welding.

Weldability and OHS of Austenitic Manganese Steels

Austenitic manganese steels are typically used for rail crossings and welding of these materials is not as straightforward as might be expected. Delegates were introduced to two Technical Guidance Notes detailing the welding procedure parameters to avoid weld defects, ensuring quality repair welding to these steels, as well as the health and safety issues related to welding of the materials.

Flame Cutting of Rail

The correct preparation of rail ends for aluminothermic welding is essential to minimise the risk of secondary weld defects. Delegates were shown how to obtain the best quality flame cut, typical defects which can occur in flame cutting of rail as well as recognition of cutting problems and corrective action.

Latest Technologies - Thermit Australia

Thermit Australia Pty Ltd has been manufacturing in Australia for over 40 years and supplied aluminothermic welding materials to railways throughout Australia and Asia Pacific. Paul Radmann of Thermit outlined a number of overseas and domestic innovations:

- Electronic straight edges to measure rail alignment and grinding profiles or calibrate existing straight edges;

- Electronic igniters for aluminothermic weld portions which do not require dangerous goods storage and handling represent a significant safety advancement. This was the first time these units had been seen in Australia;
- SkV-Elite aluminothermic weld process giving improved solidification and fatigue characteristics;
- High Performance Weld which selectively alloys the rail head to give a hard running surface but maintains ductility in the rail foot.

Improving Fatigue Life of Rail Equipment

Fatigue cracking is responsible for over 80% of weld failures in the rail industry and fatigue life can be extended by several means.

Delegates were introduced to three Technical Guidance Notes, outputs of the NDNP, giving the fundamentals of fatigue cracking and summarising the fundamentals of design to improve the weld configuration. Post-weld fatigue improvement techniques by dressing and ultrasonic impact treatment were discussed, and the Technical Guidance Notes formed part of the delegates' notes. These publications are also available free of charge from the website www.wtia.com.au

Aluminothermic Welding Defects



Welding defects lead to failure of weld joints and can have disastrous effects. Hence the avoidance of weld defects is critical. The causes of aluminothermic weld defects and the elimination of defects were examined.

Outcomes

Delegates agreed that the outputs of the NDNP, including technical information in the WTIA Technical Guidance Notes, coupled with the excellent overview of latest overseas technologies, were of significant benefit to the rail industry in Australia.

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