

Australian Industry

WINS!

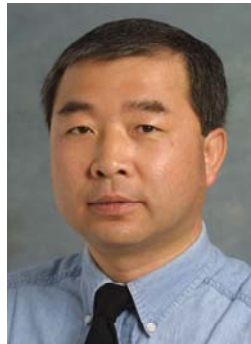
WTIA National Diffusion Networks Project (NDNP) funded by the Federal and State and Territory Governments and industry



SUCCESS STORY NUMBER R09: LEADING FATIGUE ANALYSIS EXPERT SUPPORTS RAIL INDUSTRY NEEDS – *Visiting expert from Battelle USA lectures on advanced weld modelling methodologies*

Overseas Expert

Australian industry, particularly the rail industry sector, benefited significantly from the courses and industry visits conducted by Dr Pingsha Dong from Battelle in the USA, an OzWeld Technology Support Centre within the WTIA's network.



Dr Dong is an award-winning analyst in the areas of fatigue and fracture of welded structures and advanced process computational modeling techniques for welding and joining processes. The courses held in Brisbane, Sydney, Melbourne and Perth were attended by 80 engineers who classed them as "really inspiring".

Residual Stress Modelling

The unique training course on *Residual Stresses and Distortions in Welded Structures: Modelling and Mitigation Techniques* was designed to:

- Provide a critical review of the state of art modelling and measurement techniques available to date
- Identify critical controlling parameters governing residual stress and distortion developments in engineering structures
- Demonstrate effective modelling procedures and fracture mechanics treatment techniques for fitness for service assessments
- Train the course participants to effectively define and solve day to day residual stress and distortion problems.

The course was held in Brisbane in March 2006 and attracted 21 industry delegates. Delegates from the rail industry gave excellent feedback on the outcomes from their attendance that contributed significantly to their study of fatigue on rolling stock and other rail components.

Fatigue Evaluation

The second course, attended by a total of 49 delegates attended in Sydney, Melbourne and Perth was entitled *Mesh-insensitive structural stress method for fatigue evaluation of welded structures* and set out to:

- Provide a critical review of the conventional fatigue design and evaluation methods for welded structures
- Provide a comprehensive discussion on a unique mesh-insensitive structural stress method from its mechanics basis to industrial applications
- Train the course participants to effectively define and solve day-to-day fatigue design and testing problems

Again, delegates from Member organisations within the WTIA's Rail Industry Sectoral Project reported positive outcomes from their attendance.

New Software in Australia

The courses were supported by Paul Yakimoff, Engineering Solutions Manager for LEAP Australia that provides a number of computer simulation solutions for engineering design and analysis in Australia.

These include 'fe-safe' for durability analysis and the 'Verity' structural stress method developed by Battelle, which represents the most advanced computer based method for fatigue evaluation of welded structures to date. Both these world-leading programs were introduced by Dr Dong during the courses, and their relevance to particular applications, such as in the rail industry, explored with the delegates.

Industry Visits

Dr Dong also visited a number of companies to discuss issues in the area of residual stress and it is expected that further benefits for Australia industry will be realised over the next few months.

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