

Australian Industry **OZWELD**

WINS!

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



AusIndustry

SUCCESS STORY NUMBER PE02: ROBOTIC REPAIR OF TURBINE BLADES – *Trial of leading-edge technology demonstrates potential savings of millions of dollars.*

Savings from New Technologies

Three new technologies - a programmable robot, a direct diode laser and a "gun" that feeds a metallic compound into the eye of the laser - have been successfully developed and demonstrated by the Cooperative Research Centre for Welded Structures (CRC-WS), supported by the WTIA, in an application which could mean a saving of up to \$10 million over the life of the average power station. For Australia, that might well save \$200 million or more.

Research Project

The collaborative project involving 11 power stations, was one of a suite of research activities generated through needs analysis by the WTIA's SMART Power Generation Industry Group, now part of the NDNP which is supported by the South Australian Department of Trade and Economic Development.

The project was managed by a joint committee of the CRC-WS, WTIA and industry, under the Chairmanship of Alan Beveridge from Loy Yang Power in Victoria, an NDNP Member. Industrial Research Institute of Swinburne (IRIS), ANSTO and CSIRO, all OzWeld Technology Support Centres, and Connell Wagner PPI all contributed research expertise to the project.

The project is aimed specifically at repairing the leading edge erosion of power station turbine blades in-situ using laser-based technology. This strategy provides the opportunity for eliminating the costly dismantling and replacement procedures required for individual blades and the associated plant down-time.

Laser technology

The use of laser technology, with its intense but small spot size, also limits blade distortion, enabling tolerances to be maintained. The laser is mounted on a coaxial head that enables it to reach into otherwise inaccessible places due to blade

configurations. The laser is also transportable, permitting repairs to be conducted in-situ at power stations.

Successful Trial

A recent trial was conducted at TXU Australia's Torrens Island Power station, near Port Adelaide in South Australia. A collaborative partner in the project, and active member of the SMART Group, TXU Australia provided financial and specialist expertise to the project.

TXU Asset Manager Ralph Villarosa said it was highly successful. With some further fine-tuning of the cladding process the technology offered huge potential for the power industry.

"De-blading a turbine rotor for repairs is a major exercise both in downtime and cost, and we have found that conventional welding repairs have not met our stringent safety requirements," he said. "We are very hopeful that this technology offers a cost effective solution to refurbishing turbine blades."

This Australian-designed technology has tremendous potential, not only for steam turbines, but also for use in gas turbines, boilers, impellers, hydroelectric turbines and other applications, with application in a wide range of industry sectors.



Brian Dempster, Jim Harris and Milan Brandt all from IRIS in front of the turbine

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