

# Australian Industry **ozWELD**

# WINS!

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



**SUCCESS STORY NUMBER PE08:** TEMPER BEAD WELDING – *Demonstration of specialist technology and diffusion of knowledge for the pressure equipment industry*

## Introduction

Any item of pressurised equipment that was originally post-weld heat-treated after fabrication should be post-weld heat-treated again after repair, alteration or modification.

The process lowers the risk of brittle fracture by reducing residual stresses and tempering the weld and heat affected zone microstructure. Post-weld heat-treatment, however, is an expensive process and is not always possible in situ. Considerable effort over the past 20 years has been aimed at finding alternative processes.

## Temper Bead Welding

Specialised Temper Bead Welding (TBW) techniques have been developed as an alternative to post weld heat treatment.

The ASME Boiler and Pressure Vessel code defines temper bead welding as “A weld bead placed at a specific location in or at the surface of a weld for the purpose of affecting the metallurgical properties of the heat affected zone or previously deposited weld metal”.

## Power Generation Industry Needs

The power generation industry faces particular stress relieving issues during maintenance and repair of boilers and approached the WTIA through its NDNP Pressure Equipment Industry Sectoral Project to help implement an alternative technique.

TBW is most applicable to creep-resisting steels containing Chromium (Cr), Molybdenum (Mo) and Vanadium (V) with alloy contents up to 2.25% Cr and 1% Mo commonly used in power station equipment.

As TBW is such a specialised technique, very few power station owners, or their contractors, had the required qualified weld procedures or the knowledge and skills to be able to implement them.

## WTIA role

WTIA's Welding Engineer, Leon Rosenbrock, worked with ISP members and their contractors to help them develop the expertise and procedures to be able to undertake TBW.

After initial consultation and advice, a welding procedure was developed and qualified to the ASME IX code. A test piece was welded and then cut and tested to prove the procedure.

Welding personnel were then trained and qualified to the procedure. The WTIA Technical Guidance Note TGN-PE-02 *Temper Bead Welding* was utilised during the training.

## Technology Demonstrations

A series of public forums on *Repair and Maintenance Technology for the Pressure Equipment Industry* attended by over 200 people throughout the country also introduced the Note to industry with the goal of diffusing the knowledge of this specialist technique as widely as possible. The Note is also available as a free download from the website [www.wtia.com.au](http://www.wtia.com.au).

A demonstration of the technique was undertaken at the forum held in Darwin in conjunction with the WTIA Annual Conference in October 2005, as pictured below.



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