

# 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 W02:** MECHANISED WELDING OF LARGE DIAMETER PIPE – *New pipe welding technique increases productivity and quality, as well as reduces the time and expense of projects*

## Introduction

The quality of circumferential welds in pipes, and the efficiency of their execution are important factors in the provision of an effective water infrastructure – especially in these days of water shortages where every drop is precious.

## The background

The Water Corporation of Western Australia is an active member of the WTIA's Water Industry Sectoral Project within the NDNP, with Mick Cudmore, Welding Superintendent, Chairing the SMART Water Industry Group. The NDNP is actively supported in WA by the Department of Industry and Resources.

The Water Corporation has an excellent working relationship with the subcontractors in the industry, and has worked with the WTIA to present a number of very well attended forums demonstrating a range of latest technologies for the sector.

## The Project

Until 1983, the Water Corporation had used Manual Metal Arc Welding (MMAW) techniques on its cement-lined, mild steel water pipelines. The semi-automatic Flux Cored Arc Welding (FCAW) process has been utilised since then, but the difficult in-situ working environment and the type of equipment used causes safety concerns for welders and issues regarding the quality of the welds.

The WTIA, through WA Technology Manager Prof Ian Henderson, worked with the Water Corporation and three collaborating companies, Tyco Water, OzWeld TSC member The Lincoln Electric Company, and O.J.G. Engineering on a project to assess a mechanised FCAW system. Trials of the new technology took place under workshop and field conditions. Destructive and non-destructive testing showed the weld results were impressive.

Initial welding trials were conducted at the Advanced Manufacturing Technologies Centre (AMTC), a Technology Support Centre within the WTIA's OzWeld Network.

It was found that the automated mechanised welding process addresses some the safety concerns for welders and also improves the



quality of the weld. The new system is significantly faster, taking about a quarter of the time required to do a manual metal arc weld and half of the time of a semi-automatic weld.

## Benefits to Industry

The project revealed outstanding potential cost savings. Fully-mechanised FCAW requires much less weld metal. Add to this the time saved and the results show that it's about one-quarter of the cost of manual arc welding and one half the cost of semi-automated welding.

For example, based on a project time of \$1,000 per hour and welding costs of \$80 per hour, savings on a \$6m pipeline as a result of using mechanised welding will be in the order of \$1.08m. This is due to a 50% saving on welding time .

It is expected that the benefits of mechanised FCAW will be welcomed by welding contractors. This new system is a competitive product for welding contractors who face tough competition in the market. The potential applications in other industries, such as Oil and Gas could be used to develop new markets beyond the water industry.

## Future Development

It is planned to develop the methodologies and technology further through the WTIA SMART Water Industry Group and other business stakeholders and move towards commercialising the system.

The Water Corporation firmly believes that mechanised Flux Cored Arc Welding is the standard of the future and looks forward to working with welding service providers in the adoption of this new technology.

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